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CASE STUDY:
Learning from Post-Disaster and Needs Assessment Outcomes to enhance Disaster Risk Reduction: St. Vincent and the Grenadines

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Case Study: Learning from Post-Disaster and Needs Assessment Outcomes to enhance Disaster Risk Reduction: St. Vincent and the Grenadines

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LIST OF ACRONYMS AND ABBREVIATIONS

ACP	African, Caribbean and Pacific Group of States
BCPR	Bureau for Crisis Prevention and Recovery
BRAGSA	Buildings, Roads and General Services Authority
CARILEC	Caribbean Electric Utility Services Corporation
CARICOM	Caribbean Community
CBO	Community Based Organisation
CC	Climate Change
CCA	Climate Change Adaptation
CCCCC	Caribbean Community Climate Change Centre
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CB	Community Band
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CDEMA CU	Caribbean Disaster Emergency Management Agency Coordinating Unit
CDM	Comprehensive Disaster Management
CERS	Central Emergency Relief Secretariat
CERT	Community Emergency Response Teams
CIMH	Caribbean Institute of Meteorology and Hydrology
CPU	Central Planning Unit
CWSA	Central Water and Sewerage Authority
DANA	Disaster Assessment Needs Analysis
DALA	Damage and Loss Assessment
DDC	District Disaster Committee
DIPECHO LAC	Disaster Preparedness European Commission's Humanitarian Aid for Latin America and the Caribbean
DFATD	Department of Foreign Affairs, Trade and Development
DFID	Department for International Development
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECDG-DM	Eastern Caribbean Development Partners Group on Disaster Management
ECLAC	Economic Commission for Latin America and the Caribbean
EOC	Emergency Operations Centre
EU	European Union
EWS	Early Warning Systems
FAO	Food and Agriculture Organization
FC	Family Court
GFDRR	Global Fund for Disaster Risk Reduction
GDI	Gender Development Index
GII	Gender Inequality Index
GIS	Geographic Information Systems
GDP	Gross Domestic Product

GOSVG	Government of St. Vincent and the Grenadines
HDI	Human Development Index
HFA	Hyogo Framework for Action
HR	Human resources
HTERP	Hurricane Tomas Emergency Recovery Project
ICT	Information, Communications and Technology
IDA	Initial Damage Assessment
IDB	Inter-American Development Bank
IFRC	International Federation of Red Cross
INFORM	Index for Risk Management
MCMH	Milton Cato Memorial Hospital
MIRA	Multi-Cluster/Sector Initial Rapid Assessment
MoF	Ministry of Finance
MoHILP	Ministry of Housing, Informal Human Settlements, Lands & Survey and Physical Planning
MOTW	Ministry of Transport and Works
NAEB	National Environmental Advisory Board
NCC	National Climate Committee
NDO	National Disaster Organisation
NEMO	National Emergency Management Organisation
NEOC	National Emergency Operations Centre
NHMC	National Hazard Mitigation Committee
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OECS	Organization of Eastern Caribbean States
OFDA	Office of Foreign Disaster Assistance
PAHO	Pan American Health Organization
PDNA	Post Disaster Needs Assessment
PPCR	Pilot Program for Climate Resilience
RDVRP	Regional Disaster Vulnerability Reduction Project
RRT	Regional Emergency Response Team
RSS	Regional Security System
SIDS	Small Island Developing State
SITREP	Situation Report
SWMU	Solid Waste Management Unit
SMU	Soufriere Monitoring Unit
SOP	Standard Operating Procedure
SPCR	Strategic Program for Climate Resilience
SVG	St. Vincent and the Grenadines
UN	United Nations
UNDG	United Nations Development Group
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
US	United States
USAID	United States Agency for International Development
USD	United States Dollars
UWI	The University of the West Indies
VINLEC	St. Vincent Electricity Services
WB	World Bank

PREAMBLE

An essential but often overlooked aspect in the practice of disaster risk reduction (DRR) is that of continuous improvement. Unfortunately, it is oftentimes in the aftermath of a disaster or post-impact that the weaknesses and deficiencies in DRR early warning systems and practices come to light. At the same time, when such weaknesses and deficiencies are exposed in the form of losses and damage, it is incumbent that the lessons are heeded and directly fed back into pre-event preparations and planning to strengthen resilience for the next time around. This is precisely the case described here, in St. Vincent and the Grenadines in the aftermath of a well-documented extreme rainfall event in November 2014.

A series of post-impact assessments were undertaken by the local authorities and teams comprising additional experts and representatives of several institutions and non-governmental organisations (NGOs) coming to aid. The penultimate assessment, the Post Disaster Needs Assessment (PDNA), was implemented for the first time in this context. While, as expected, the PDNA eventually provided the much needed guidance and recommendations for action planning and relief both nationally and in the affected communities, a constructive circumspection also identified a glaring deficiency in the tool, its usage and design. It was felt by the PDNA teams, that the tool was not as gender sensitive as it should be, causing gender sensitive observations and information to be under-reported and/or masked within the larger assessment and recommendations.

The objectives of this case are, therefore, two-fold. First, to describe the event and event context, including the procedures and implementation involved in post-event assessments. Secondly, to highlight the gender sensitivity deficiencies in the PDNA design and implementation in St. Vincent and the Grenadines (SVG), and recommend how lessons learned there can and should influence the design and implementation of PDNA in the future. The case explores and documents outcomes, barriers, opportunities and success factors in PDNA practice and makes the argument for greater gender sensitivity in future processes, both for ensuring gender sensitive action plans for relief and for feedback into the DRR process in the future.

This case was developed through the collection and analysis of primary and secondary data and information. Primary information was collected from open-ended interviews with numerous informants in St. Vincent and the Grenadines including the National Disaster Office, Ministry of Planning and Development, Ministry of Agriculture and members of the affected communities and local businesses. Secondary information was collected from government documents and project reports, project website, media documents and public information. Agencies providing relevant documents used in the case study include the Caribbean Disaster Emergency Management Agency (CDEMA) and the Caribbean Institute for Meteorology and Hydrology (CIMH). Data analysis consisted of examining, categorizing and recombining the evidence to answer the main question which focuses on the utility of the PDNA for gender sensitivity. Reliability was assured through progressively more detailed data collection and progressively focused second and third interviews with relevant informants. Internal validity was maximized by triangulation of data sources and the use of multiple respondents.

It is expected that several audiences will gain from this case study. First, students and learners interested in DRR in general and more specifically in post-disaster assessment planning and practice will gain from the events that took place in St. Vincent and the Grenadines. Secondly, development professionals and national disaster coordinators and allied professionals can consider the strengths, weaknesses, opportunities and threats of PDNA being adapted and evolving in the Caribbean context. Thirdly, government and regulatory agencies involved in DRR may relate to some of the challenges involved in design and delivery of PDNA that fully encompasses important gender sensitivity issues, gaining some insights and ideas that can activate efforts in their respective agencies/organisations.

EXECUTIVE SUMMARY

The National Disaster Offices (NDOs) in the Caribbean have been introduced to an assessment tool known as the Post-Damage and Needs Assessment (PDNA). This assessment tool represents the culmination of the predecessors in the following order: the initial damage assessment (IDA), the damage and needs assessment (DANA) the damage and loss assessment (DALA) and the multi-cluster/sector rapid assessment (MIRA). The cascade of data, information and intelligence that emerges in the final assessment report of the PDNA, is such that PDNA is used by tripartite donor agencies of the European Union (EU), the United Nations Development Group (UNDG) and the World Bank (WB). These entities are able to streamline donor interest with ongoing or potential projects for recovery and reconstruction in affected states.

In 2014, the PDNA tool was officially introduced to representatives of regional NDOs as part of the model National Recovery Framework. Its applicability to St. Vincent and the Grenadines was demonstrated. The tool was welcomed but it was to be shown how this powerful instrument for access to aid, would seamlessly align to assessment processes already in place, especially given that all pre-assessments were to meet the standard required of the PDNA. The PDNAs conducted under the leadership of affected country governments, with the assistance of the Global Facility for Disaster Reduction and Recovery (GFDRR) and the international community are instruments used to determine recovery and reconstruction plans and programmes; and, inter alia, leverage targeted assistance from traditional donors.

This study illustrates the assessment processes, capped by the PDNA tool, that were employed in the recovery and reconstruction phases of St. Vincent and the Grenadines. It presents a critical review of challenges foreseen in the integration of the tool into the pre-existing assessment landscape, and the strides made in making the assessment process a concerted effort. In so doing, the case highlights how the recommended recovery and reconstruction frameworks and plans were as comprehensively grounded as possible, for the effective implementation of disaster risk reduction (DRR) mechanisms.

More than this, the study illustrates the extent to which previously overlooked or under-emphasised dimensions including gender sensitivity, have been identified and are gradually becoming more prominent in the tools, processes and national systems. Subsequently, effective approaches to ensure inclusion of these cross-cutting dimensions that enhance recovery and disaster risk reduction efforts are noted and recommendations advanced for continuance and expansion of such trends.

INTRODUCTION

1 INTRODUCTION

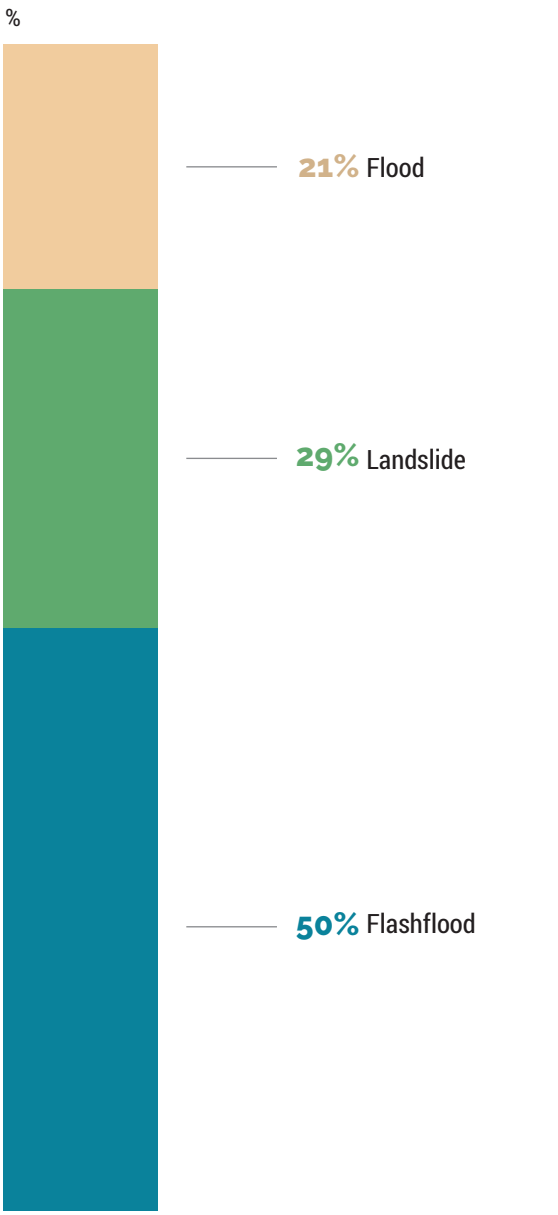
1.1 THE HAZARD PROFILE OF ST. VINCENT AND THE GRENADINES

St. Vincent and the Grenadines has experienced many extreme weather events in the last decade and the increasing frequency, intensity and sporadic nature have been attributed to the influence of climate change on the region. Other hazards include [1]volcanic eruption, [2]water pollution (CDEMA, n.d), infestations and chemical spills. Moreover, Appendix B records in descending order, the quantity of losses incurred as a result of the following hazards: storm surge, wind, earthquake and tsunami. Nationally reported losses from 1990-2014 are illustrated in Figures 2a, and 2b. Flashfloods account for half of all hazard related deaths, while hurricanes account for half of the economic losses over the time period. Nevertheless, with respect to floods and storms, the latter was noted to occur with almost twice the frequency of floods. However floods were thrice as likely to result in mortality and economic issues (INFORM, 2015).

Source: Illsley, n.d.

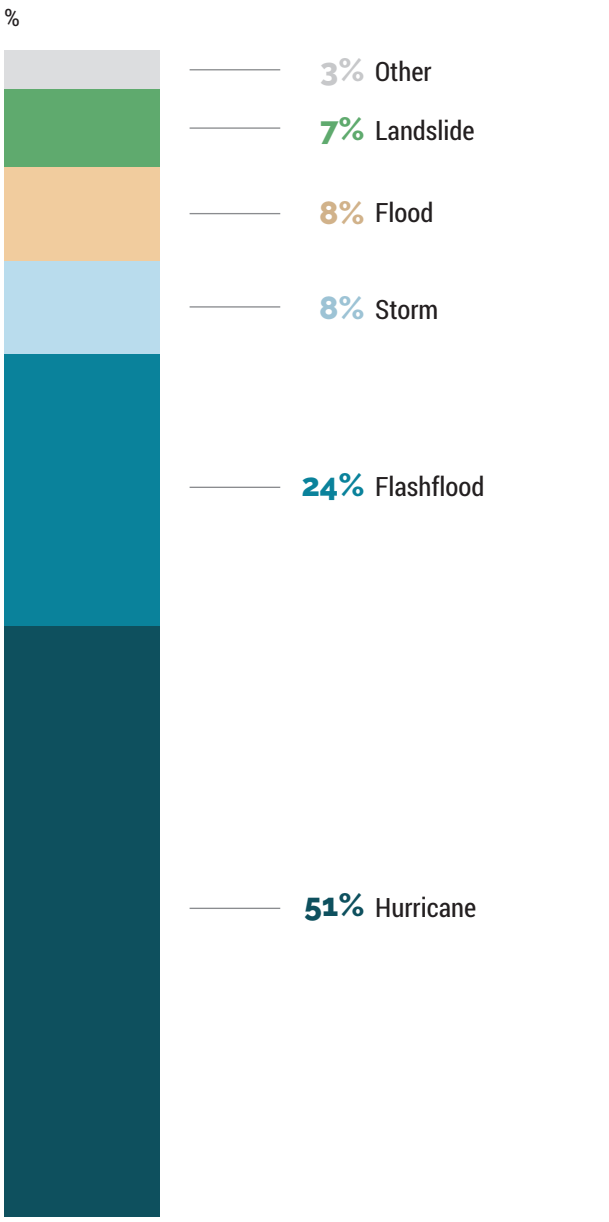
FIGURE 1: FIGURE 1: SATELLITE IMAGE MAP OF SAINT VINCENT AND THE GRENADINES

[1] The eruption would be of the La Soufriere Volcano. The last eruption occurred on April 10, 1979
[2] Pollution due to discharges of effluent and other waste by pleasure yachts; in some areas, pollution is severe enough to make swimming prohibitive (CDEMA, n.d.)-complete reference



Note: Adapted from INFORM, 2015. Nationally Reported (Mortality) Losses 1990–2014.

FIGURE 2A: NATIONALLY REPORTED MORTALITY LOSSES (1990–2014)



Note: Adapted from INFORM. Nationally Reported (Combined Economic) Losses 1990–2014.

FIGURE 2B: NATIONALLY REPORTED COMBINED ECONOMIC LOSSES (1990–2014); (INFORM, 2015)

TABLE 1: HISTORICAL EMERGENCY/DISASTERS IN ST. VINCENT AND THE GRENADINES (SVG; UN, 2014)

Year	Date	Type		Name	Impact
		General	Specific		
2013	December 30	Hydro-meteorological	Low Level Trough	---	12 dead; over 10,000 persons affected. Over 200 persons in shelter;[3] approximately 600 homes damaged, over 60 destroyed. Flooding of the Milton Cato Memorial Hospital (MCMH). Tourism sites impacted. Small businesses impacted. 14 bridges destroyed. 14 severely damaged. Major roads damaged. Feeder roads severely impacted[4]. Airport closed for almost 24 hours. Schools closed for an additional week; 50% of consumers without water. Two hydro plants impacted (NEMO, 2014). Forests substantially denuded; beyond 10% of the total forest area (Gonsalves, 2014). Psychological anguish or trauma is evident among the suffering and vulnerable people (Gonsalves, 2014).
2011	May 3	Hydro-meteorological	Low Level Trough	---	Torrential rainfall affected the NE of the country resulting in severe flooding, landslides, damage to roads and bridges, disruption of water supply and displaced 56 families.
2010	October 30	Hydro-meteorological	Hurricane	Tomas	28% of the population affected, 5% of them severely. Over 1200 in shelters. Total impact of EC $133M or 10.5% of Gross Domestic Product (GDP). Forestry & agriculture significantly impacted – both crops and infrastructure. Infrastructure also affected by flooding and landslides.
2008	September 18	Hydro-meteorological	Tropical Wave	---	Damage to coastal infrastructure – hotels, beaches, sea defences, jetties, fishing and other vessels, port facilities and many other businesses.
2007	---	Hydro-meteorological	Hurricane	Dean	10% of banana crops and 6 fishing boats destroyed. 7 houses destroyed and families relocated.
2005	---	Hydro-meteorological	Hurricane	Emily	533 houses severely damaged. 18 houses completely destroyed.
2002	---	Hydro-meteorological	Tropical Storm	Storm Lili	4 deaths 640 houses severely damaged 24 houses completely destroyed 16 houses relocated 500 persons sought emergency shelters
1999	---	Hydro-meteorological	Hurricane	Lenny	Affected the leeward coastal areas and the Grenadines Storm surge caused damage to marine infrastructure and roads
1987	---	Hydro-meteorological	Hurricane	Emily	Sectors affected – agriculture, housing, marine, infrastructure, road network, social and economic
1986	---	Hydro-meteorological	Tropical Storm	Danielle	Heavy flooding and landslides 5 persons seriously injured 436 houses affected, over 100 completely destroyed 142 persons evacuated to shelters Damage to bridges and roads as well as disruption to water and electricity supply 40% of banana cultivation damaged or destroyed 2,050 acres of other agricultural crops damaged 120 domestic animals killed
1979	---	Geological	Volcanic Eruption	Soufriere	Evacuation of 20,000 people from the northern villages Extensive crop damage

Note: Hurricane Janet (1955) and Hurricane Allen (1980) both produced severe hurricane winds on St Vincent but damage reports for these events are not available (CCRIF, 2013).

Amended and adapted from the Post Disaster Needs Assessment Preliminary Report, (UN, 2014).

[3] some 300 of whom require relocation (Gonsalves, 2014)

[4] making certain habitable and farming areas impassable; many rivers overflowed their banks and caused widespread destruction (Gonsalves, 2014)

1.2 RISK, VULNERABILITY AND COPING CAPACITY PROFILE

The geographic location, topography, land mass type and volcanic features make St. Vincent and the Grenadines susceptible to hazard impact, especially hydro-meteorological events. The linear distribution of physical (critical) resources and human resources increases exposure to hazards. GDP exposures were as follows: 30% commercial, 28%, institutional, 23% agricultural and 21% residential (CCRIF, 2013).

Risk can be defined as the potential disaster losses in terms of lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period. A country's risk profile considers hazards, exposure, vulnerability and coping capacity:

Risk = Hazard x Exposure x Vulnerability is further defined as Risk = (Hazard&Exposure) x (Vulnerability/Coping capacity), and finally Risk = (Hazard&Exposure) x Vulnerability x Lack of Coping Capacity (INFORM, 2015)

Here hazard refers to exposure to danger, harm or loss; exposure refers to people, property, systems or other elements present in hazard zones that are thereby subject to potential losses; vulnerability refers to the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard; and coping capacity refers to the ability of people, organisations and systems, using available skills and resources to face and manage adverse conditions, emergencies or disasters.

Among 191 country risk profiles, St.Vincent and the Grenadines receives a risk profile score of medium which is similar to that of Suriname, Hungary, Australia, Germany, the Czech Republic and the United Arab Emirates (see Figure 3). This score takes into consideration equally weighted dimensions of hazard and exposure, vulnerability and lack of coping capacity, with dimensions being further disaggregated into categories and indicators (see Figures 4a and 4b).

[5] St Vincent and the Grenadines lie in a relatively [quiet] zone of the Lesser Antilles island arc; earthquakes are more common to both the north and south (CCRIF). Still, environ earthquake events may precipitate tsunami incidents.

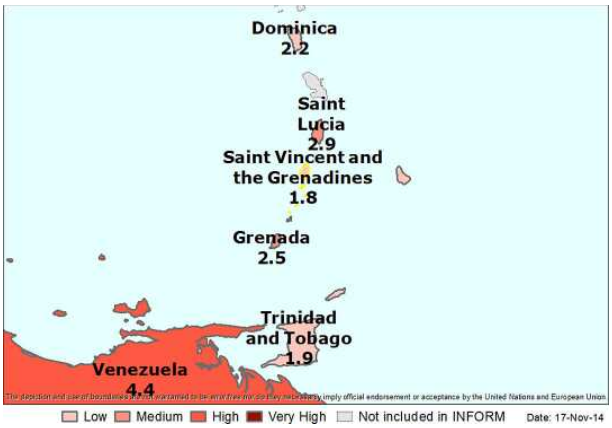


FIGURE 3: OVERALL RISK SCORE FOR ST. VINCENT AND THE GRENADINES ([6]INFORM, 2015)

	Value	Rank	Trend (3 years)
INFORM Risk	1.8	161	⇨
Hazard & Exposure	0.9	168	⇨
Vulnerability	2.0	131	⇩
Lack of Coping Capacity	3.5	139	⇨

FIGURE 4A: RISK DIMENSION VALUES FOR ST. VINCENT AND THE GRENADINES (INFORM, 2015)

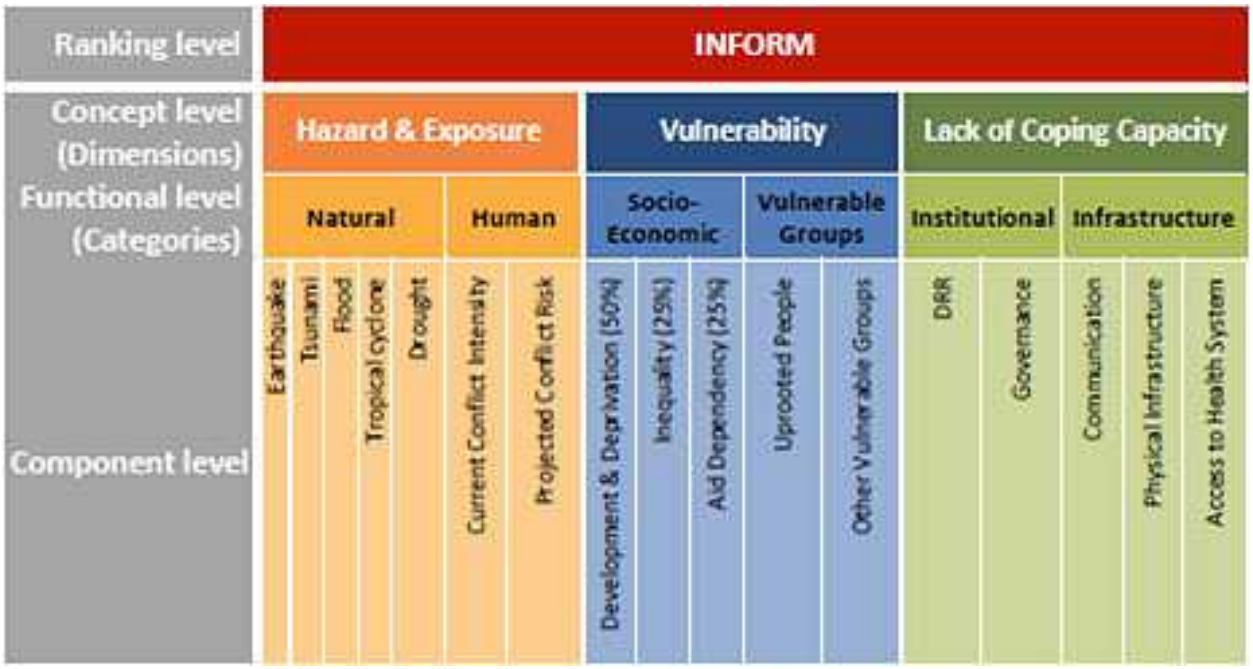


FIGURE 4B: RISK DIMENSION VALUES FOR ST. VINCENT AND THE GRENADINES (INFORM, 2015)

Note: Values may range from 0 to 10; and Rank is from a range of 1 to 191.

The risk profile utilises a scale from 0 to 10 to determine the profile score. Hazard and exposure is due to natural events, as opposed to human events as depicted in Figure 5. While vulnerability is relatively low (3.39); it is more the result of socio-economic factors than the presence of vulnerable groups. Conversely, the country's coping capacity is considerably low (3.5), mainly due to a lack of contribution by DRR measures and physical infrastructure factors. Nevertheless, lack of coping capacity is caused by inadequate access to health care, communication, infrastructure, governance and physical infrastructure (in that descending order).

[6] INFORM (The Index for Risk Management) provides a global, open-source risk assessment for humanitarian crises and disasters. It can support decisions about prevention, preparedness and response. It is the result of collaboration between the Inter-Agency Standing Committee Task Team for Preparedness and Resilience and the European Commission.

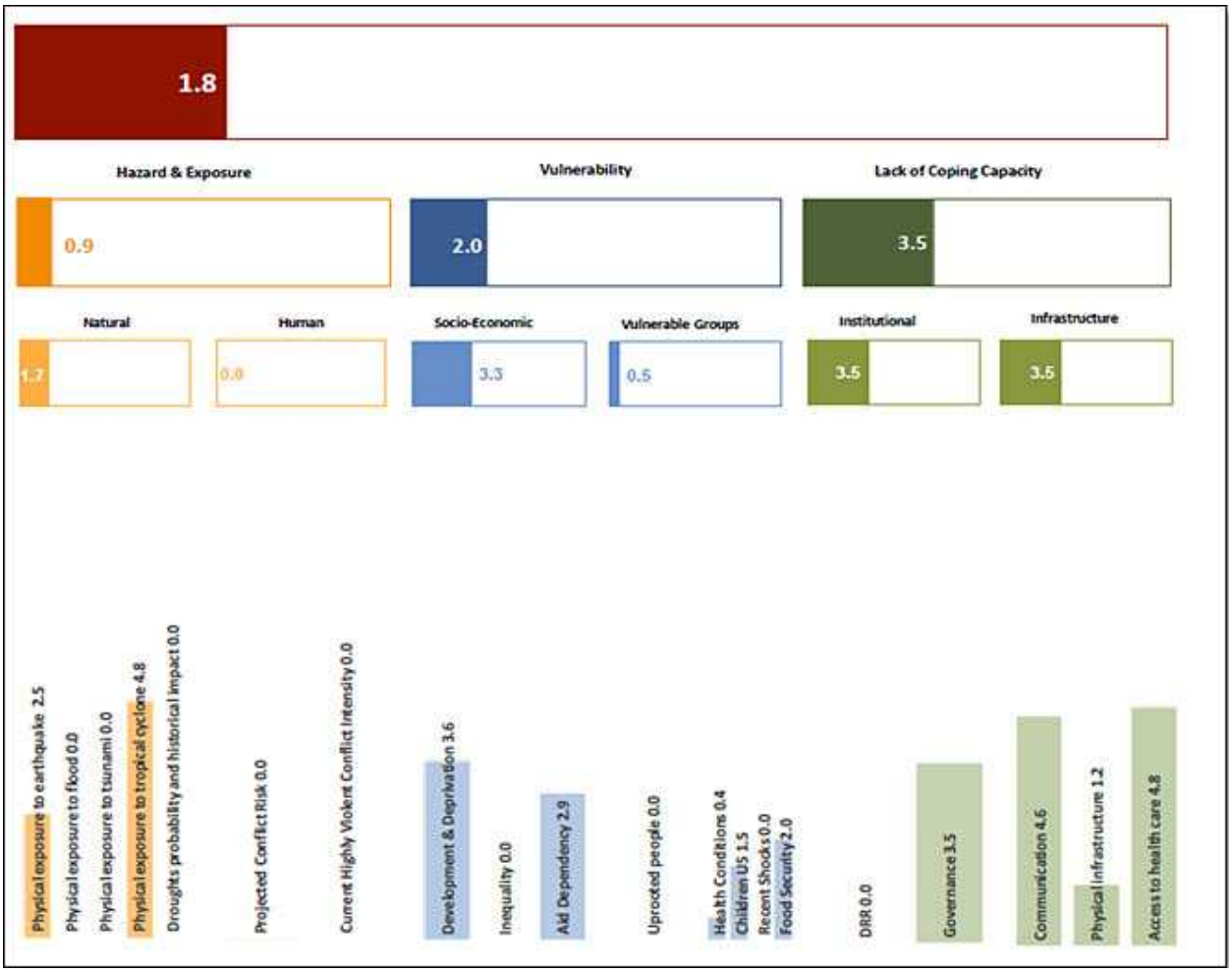


FIGURE 5: RISK SCORE: RISK DIMENSION VALUES AND RISK INDICATOR VALUES FOR ST. VINCENT AND THE GRENADINES

1.3 NATIONAL DISASTER MANAGEMENT IN ST. VINCENT AND THE GRENADINES

The[7] National Emergency Management Office (NEMO) was established in 2002. As the administrative and operational arm of national emergency/disaster (risk) management, NEMO coordinates the use of all available resources (at local, regional, and international levels) to ensure that all the people of St. Vincent and the Grenadines are better able to mitigate disasters, , respond and recover from the impact of disasters in the shortest possible time (NEMO, n.d.)

Further to this, the role of NEMO is five-fold:

- Informing: The development and dissemination of information which will enhance the capability of the individuals or private organisations to cope with emergencies and get help when needed.
- Warning: The analysis and forecasting of the nature of potential hazards.
- Coordinating: The development of systems to enable resources to be effectively utilised in responding to emergencies.
- Providing: The provision and maintenance, when necessary, of extraordinary resources as well as the diversion of normal resources to meet emergency needs.
- Evaluating: Review of the performance of the organisation with a view to facilitating improvement (NEMO, n.d.)

The NEMO framework comprises a number of specific groups which undertake these objectives. They include the National Emergency Council (NEC), the National Emergency Executive Committee (NEEC) and the District Disaster Management Committees (DDMC) as shown in Figure 6.

The recently drafted National Hazard Mitigation Policy establishes an equitable nexus between emergency/disaster (risk) management and sustainable development. Thus, NEMO's services as part of the Central Planning Unit (CPU) include advising on development proposals to ensure that consensual standards are met. NEMO also works closely with the National Hazard Mitigation Committee (NHMC), to support the development of a comprehensive, national hazard and vulnerability map to ensure the identification of hazards and vulnerability to protect current and future development in the public and private sectors. This NEMO and NHMC collaboration continuously assesses institutional capacity to facilitate mitigation. Annex H identifies the DRR gaps and associated actions to be taken to achieve the post 2015 vision.

[7] NEMO a department of the Ministry of National Security, Air and Sea Port Development,

FIGURE 6: THE ORGANISATIONAL STRUCTURE OF DISASTER RISK MANAGEMENT (DRM) IN ST. VINCENT AND THE GRENADINES (SVG; UN, 2014)

POST DISASTER NEEDS ASSESSMENT PRACTICE IN DISASTER RISK REDUCTION

2

2 POST DISASTER NEEDS ASSESSMENT PRACTICE IN DISASTER RISK REDUCTION

Disaster Risk Reduction (DRR) is a systematic approach to identifying, assessing and reducing risks of disasters. It aims to reduce socio-economic vulnerabilities to disaster and also deal with environmental and other hazards that trigger them. It should be an integral part of the way organisations undertake their work and not an add-on or one-off action. DRR is very wide-ranging in its scope, being far broader and deeper than conventional emergency management.

The principle of accountability lies at the heart of genuine partnership and participation in DRR. It applies to state institutions that are expected to be accountable through the democratic process and to private sector and non-profit organisations that are not subject to democratic control but which are still accountable as stakeholders. Accountability is an emerging issue in disaster risk reduction work. Accountability should be primarily toward those who are vulnerable to hazards and affected by them. Many organisations working in international aid and development are now committing themselves to a 'rights-based' approach. This tends to encompass human rights (i.e., those that are generally accepted through international agreements) and other rights that an agency believes should be accepted as human rights.

Post-Disaster Needs Assessment (PDNA) is a critical but sometimes overlooked part of disaster relief. It is also a critical evaluative mechanism for DRR because it gauges the extent to which post damage disaster has been averted because of the efforts made in DRR pre-impact. In other words, to a great extent, loss and damages measured through the PDNA give a reasonable indication of the success (or lack thereof) in DRR. PDNA is essentially a synthesis of Damage and Loss Assessment (DaLA) and human recovery needs assessment. It typically includes the recovery and reconstruction framework that guides the post-disaster recovery strategy.

The PDNA entails damage, loss and macro-economic impacts on the affected economy; impacts on livelihoods, incomes, and human development; short, medium and long-term recovery and reconstruction needs and measures for mainstreaming disaster risk reduction in post-disaster recovery and reconstruction plans. PDNA is the universal template for assessing net disaster impact. It lays down standard operating procedures for the engagement of the international development community for post-disaster needs assessments and recovery frameworks. The objectives of the PDNA exercise are:

i. to estimate the overall human and socio-economic impact of the disaster in the country as a whole and in the affected areas (damages, losses, macro-economic impact and livelihoods);
ii. to prepare a PDNA and Recovery Framework Report that will outline the basic recovery and reconstruction needs for the affected areas (based on the needs for each economic sector);
iii. to incorporate "build back better" principles and the cost of risk management activities linked to the recovery and reconstruction efforts proposed; and
iv. to enhance the capacity of the country team, comprising both Government and international agencies, to carry out the human impact assessment and needs assessment.

Gender Sensitivity in PDNA

Gender has been identified as an important cross-cutting issue in PDNAs. This is due to the increased acknowledgement that disasters have different impacts on women, girls, boys and men. They face different risks and have different capacities and resources on which to draw to respond and cope. Gender relations tend to be culturally-specific and characterised by unequal distribution and/or access to power and resources, differences in mobility and in the ability to make life decisions and to voice priorities and needs, as well as to explore and use individual potential and capacities.

The aftermath of an emergency or disaster can present opportunities for new and more progressive gender roles and relationships to emerge. For example, women assume enhanced roles in providing for their families and emerge as leaders and decision-makers in their communities; girls who may not have had a chance to attend school may do so; boys are protected from recruitment or forced labour; and men take on expanded roles in child care.

It is therefore critical that gender is mainstreamed in every step of the PDNA to ensure that recovery interventions are relevant, effective and sustainable for women and men in the affected population. Gender mainstreaming ensures that recovery efforts will reduce, rather than reinforce inequalities by avoiding assumptions, generalisations and stereotypes and promote positive change. Gender-sensitive PDNAs can also increase and broaden ownership and sustainability of recovery initiatives by ensuring greater ownership through equal involvement of the population as a whole.

2.1 APPLICATION OF PDNA IN ST. VINCENT AND THE GRENADINES

The Christmas Low Trough Event – December 24–25, 2013

Near the end of December 2013, severe rains and high winds due to a low level trough system caused floods and landslides in St. Vincent and the Grenadines, a 32 island archipelago[8] of mountainous terrain[9]. Nine deaths were reported and just about 10% of the 111,193 populace was affected. Over 30 homes were destroyed and a further 135 damaged, resulting in 237 being provided with emergency shelter. The islands' hydroelectric power and agriculture were also impacted (Brown, 2013). The Government declared a [10]Level 2 Disaster. Post disaster damage and needs assessments were conducted through the coordinated efforts of the National Disaster Office (NDO), local emergency response and recovery partners and the Caribbean Disaster Emergency Management Agency (CDEMA).

[8] SVG lies at 13 degrees 15' north latitude and 60 degrees 56' West longitude, approximately 1,600 miles southeast of Miami. St. Vincent is the largest island and the Grenadines extend 45 miles to the southwest: Bequia, Mustique, Canouan, Petit St Vincent, Union, Isle à Quatre, Mayreau and the Tobago Cays (Marine Administration, n.d.). St. Vincent and the Grenadines has an area of 389 km and a coastline measuring 84 km (CDEMA, n.d.)
[9] The lowest point is the Caribbean Sea (0 m) and the highest point the Soufriere volcano (1,234 m).
[10] An incident occurring within St. Vincent and the Grenadines for which local resources and response capacity are limited. Focused specialiszed regional assistance is required such as the provision of technical assistance, specialiszed equipment, emergency funds and support personnel. Actions at this level may include the activation of the regional response mechanism and a request for international support. A state of emergency/disaster area may or may not be declared." (Gonsalves, 2014).

Data from the Caribbean Institute of Meteorology and Hydrology (CIMH) shows that a small low level trough had moved into the Eastern Caribbean under the influence of a mid to upper level trough. The orientation of the eastern side of the upper level trough had significantly enhanced showers and thunderstorm activity over the states of the Eastern Caribbean (CDEMA, n.d.). For SVG, the trough caused severe rains and gusty winds, from Christmas Eve to Christmas Day, 2013. Excessive rainfall occurred in the mountainous interior of the northern half of St. Vincent, (particularly on the north-east and north-west). Accumulated rainfall reached about 10 inches in less than five hours, resulting in extraordinary floods, landslides and consequential loss and damage, the likes of which the country had never experienced in living memory (Gonsalves, 2014). The country rainfall totals for the period are recorded in Figure 7.

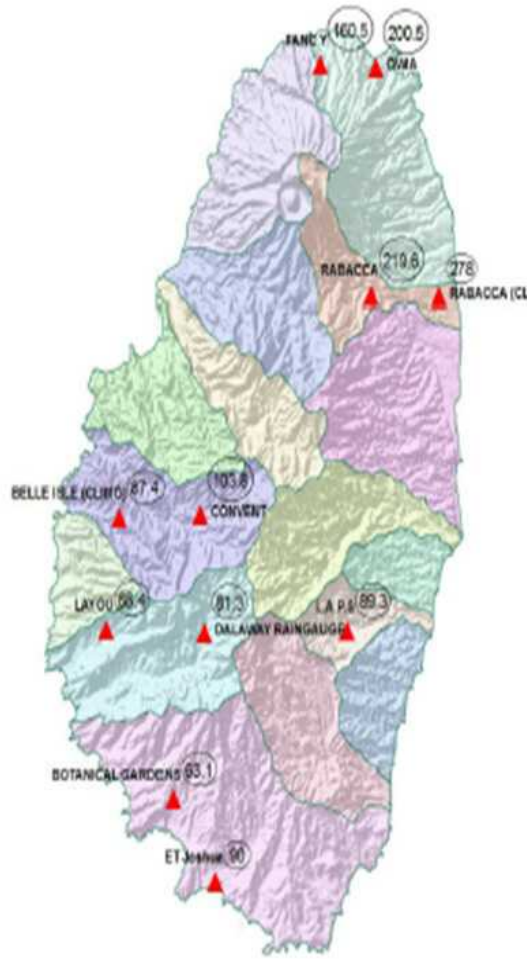


FIGURE 7: RAIN GAUGE STATIONS IN ST. VINCENT (ACP-EU, 2014)

Response

The incident was set at [11]Level 2 and a national disaster was declared. The designation of 'national disaster' was used because it was a sudden, calamitous event that seriously disrupted the functioning of the country and exceeded its ability to cope using its own resources. Several areas were also deemed disaster areas; more than 11,000 persons were directly affected in these [12]disaster areas (Gonsalves, 2014). Figure 8 illustrates the flood-prone areas and Appendix A provides contextual statistics for SVG.

The national disaster management plans were set in motion with the National Emergency Operations Centre (NEOC) being activated and volunteers involved in coordinating the response operations (CDEMA, n.d.).

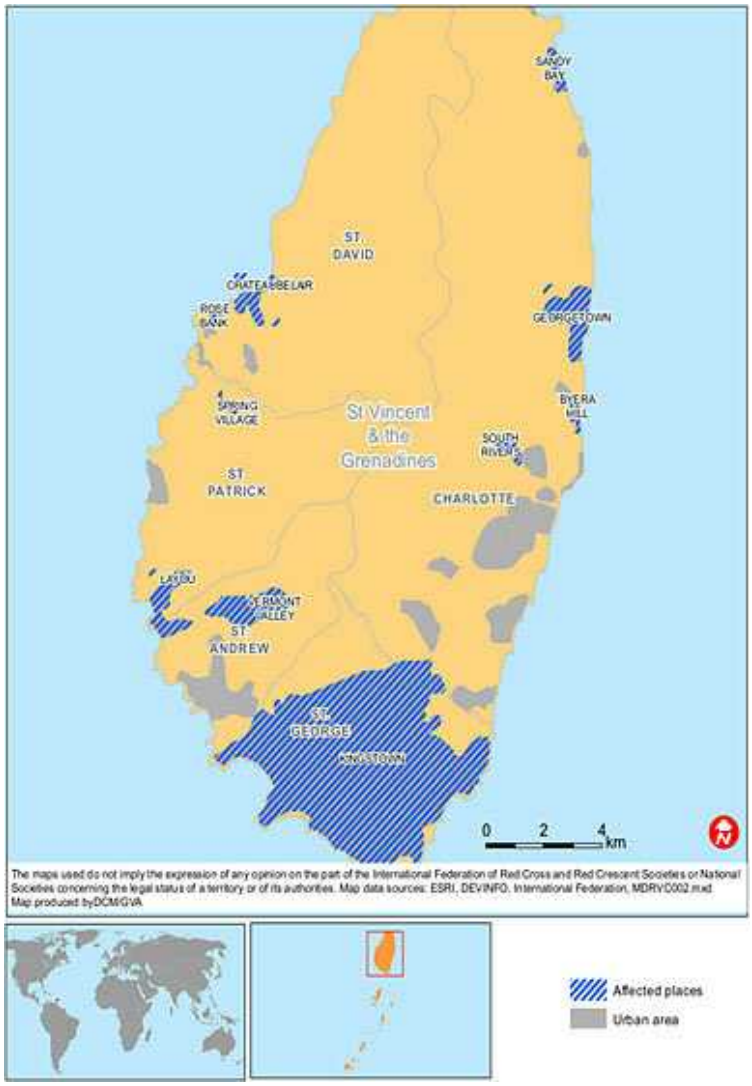


FIGURE 8: ST. VINCENT AND THE GRENADINES: FLOOD PRONE AREAS (IFRC, 2013)

[11] "An incident occurring within St. Vincent and the Grenadines for which local resources and response capacity are limited. Focused specialised regional assistance is required such as the provision of technical assistance, specialised equipment, emergency funds and support personnel. Actions at this level may include the activation of the regional response mechanism and a request for international support. A state of emergency/disaster area may or may not be declared.

[12] these are geographical locations on the western side of St. Vincent, including Vermont Valley to Buccament Bay, Spring Village, Rose Bank, Dark View, Petit Bordel, Chateaubelair, Fitz-Hughes and Richmond; and on the north-eastern side, including South Rivers, O'Brien's Valley, Dickson, and Spring Village, Georgetown, all the way north, up to Fancy (Gonsalves, 2014); see Appendix C for more.

According to Tthe Situation Report (SITREP) #4 on the incident, read thatthe immediate needs were identified [following preliminary impact assessment]. More detailed damage assessment reports were being compiled, as Damage and Needs Assessment (DANA) teams were deployed (CDEMA, n.d.).

In addition to maintaining contact with the affected state and coordinating response activity, the regional emergency/disaster management agency (CDEMA) initiated the Regional Coordination Plan and activated elements of the [13]Regional Response Mechanism; including the Eastern Caribbean Development Partners Group on Disaster Management (ECDPG-DM), the Regional Security System (RSS) the Pan American Health Organization, the University of the West Indies and the Caribbean Development Bank (CDEMA, n.d.).

TABLE 2: RESPONSE ACTIVITIES BY COUNTRIES AND AGENCIES

Barbados	- Made available the Barbados Coast Guard Vessel "Trident" to transport water and other supplies. - Transported in a RSS aircraft, [14]a technical, fact-finding team from the ECDG-DM conducted three missions.
Trinidad and Tobago	- Provided two containers of relief supplies valued at approximately US $0.53 million.
CIMH	- Deployed a technical team to collect field data and conducted site visits to assist with the assessments of the hydrological and landslide areas.
CDEMA	- Assigned a Technical Resource Officer to the National Emergency Operations Centre (NEOC) for one week to provide operational support. - Assisted SVG in developing proposals to access the CDB Emergency Response Grant facility.
DFID	US$10,000-20,000 was made available
USAID/ OFDA	- Provided US$50,000 to the SVG Red Cross Society to support the emergency response
UN Agencies	- PAHO procured supplies in the amount of EC $0.12 million, for cleaning up and immediate needs. - UNDP allocated relief funds under the Emergency Response Grant from the Office for the Coordination of Humanitarian Affairs. - UNICEF made extensive donations, including 3,650 water purification tablets, recreation kits, school in box kits, hand sanitisers and adult hygiene kits.

(More details are included in Appendix D.)

[13] A sub-regional organisation of the Caribbean of which St. Vincent and the Grenadines is a member. Other CDEMA member states constituting this sub-region are Barbados, Dominica and St. Lucia. Barbados is the central sub-regional focal point in the CDEMA system.
[14] The team comprised eight technical level delegates from CDEMA, CIMH, UNDP, Department of Emergency Management, Barbados, RSS and the Caribbean Media Corporation.

Assessments

The Initial Damage Assessment (IDA) process, using the United States Agency for International Development (USAID) / Office of U.S. Foreign Disaster Assistance (OFDA) methodology, commenced on Christmas Day, 2013 on the leeward side of the island (Preliminary[15] assessments findings are recorded in Appendix C). Subsequently, the [16]DANA was performed. Social assessments led by the Ministry of National Mobilisation and the Central Planning Division were also performed commencing on December 26, 2013 in the communities of South Rivers and Buccament, followed by Spring Village on December 27. PAHO also conducted a rapid needs assessment for the health sector on December 29 and submitted a report on[17] the findings, priority areas, immediate and longer term recommendations. A damage[18] and loss assessment[19] (DALA) was done; the results are shown in the Appendix D. Lastly, a post disaster needs assessment (PDNA) was performed to satisfy the objectives of (a) impact assessment (of the floods and landslides); (b) devise a strategy for recovery, from restoration of services to rehabilitation and reconstruction of shelter, infrastructure, livelihoods and economy, while (c) ensuring future flood resilience, as well as its financial implications.

NEMO identified a number of challenges in the damage assessment processes. It noted the infiltration of political influences and a degree of data inaccuracy encountered in the initial damage assessment process. The social assessment identified new actors that had not been considered previously. Moreover, the collection dates in constituencies varied in the damage and needs assessment process.

Research Domains	
Relief and recovery • Government capacity to respond • Patterns of support • Targeting, equity, vulnerability • Process of delivery • Decision-making and accountability • Communications • Perceptions of the aid effort • Resolution of aid-related problems	**Social relations and cohesion** • Social composition • Relations among social groups (gender, age, ethnicity, religion), including migrants • Relations between villages/neighborhoods • Collective action • Access to social justice/social protection • Crime and violence •
Socioeconomic impacts • Livelihoods • Access to capital and indevtedness • Impact on land and other resources • Migration • Displacement (temporary or permanent) • Coping strategies • Longer-term vulnerability	**Local institutions** • Village/community administration • Capacity • Relations between leaders • Relations between leaders and community members • Role of community organizations • Role of private sector

FIGURE 9: DIMENSIONS OF SIA

[15] A preliminary Damage and Needs assessment shall be conducted within the first 12 hours after the cessation of event-related activities. An interim report should be presented 72 hours after the event and a detailed report one week later (NEMO, 2005). See Appendix E for the preliminary assessment findings.
[16] The ECDPG-DM team attended a DANA meeting with Vincentian Prime Minister Dr Ralph Gonsalves, where they were able to get a better understanding of the islands' specific needs and areas for support.
[17] The estimated damage cost for Milton Cato Memorial Hospital (MCMH) was USD$314,210.85. (Is this figure inclusive of CT scan?
[18] Damage is defined as the monetary value of fully or partially destroyed assets. It is initially assumed that assets will be replaced to the same condition— in quantity and quality—that they had prior to the disaster (ACP-EU, 2014).
[19] Losses are defined as the changes in the flows of goods and services, that will not be forthcoming in the affected area until full economic recovery and reconstruction has been achieved. They include production of goods and services that will not be obtained or provided, higher costs of operation and production, and the cost of the humanitarian/emergency assistance activities. Losses are expressed in current values (ACP-EU, 2014).

2.2 ASSESSING THE OUTCOMES

A grant from the Global Fund for Disaster Risk Reduction (GFDRR) was provided for a rapid damage and loss assessment two weeks later, helping the government identify losses of $108 million, the equivalent of 15% of GDP. The assessment demonstrated which public and private infrastructure[20] were hardest hit. (GFDRR, n.d.). The social impact as outlined in Table 2 included loss of life, loss of livelihoods, loss of homes and belongings and trauma (NEMO, 2014).

TABLE 2: SOCIAL IMPACT

[21]Total Affected Population		
Primary Affected Population	1,697	Displaced , Injured and Dead
Secondary Affected Population	1,103	Farmers - lost livelihoods
Tertiary Affected Population	54,995	50% of population without water for 19 days
No direct impact	53,589	
Total	**109,991**	

Source: NEMO,2014

Note: A more detailed social assessment of the gender specific impact would be required to determine the full social impact of the disaster. The population definitions are as follows:

- The primarily affected include those who have perished or suffered injury as a result of the event.
- The secondary affected is defined as those who live within the disaster-affected geographical area and who sustained indirect effects such as: interruption of basic services (water supply, sanitation, electricity, transport and communications), losses in production of agriculture, livestock, fisheries, industry, commerce, mining and tourism activities, and higher costs in receiving goods and services.
- The tertiary affected are those who may live outside of disaster-affected geographical area but who sustained secondary effects of the disaster such as: increased costs of transportation to affected area, scarcity or higher costs of goods and services originating from the affected area, lack or insufficiency of goods and services due to reallocation of public resources to the affected area.

[20] Reports from the Roads, Building and General Services Authority (BRAGSA) and the Ministry of Transport and Works, indicate that several roads and bridges in the impacted areas have been broken, washed away or severely undermined. River defenses along most of the rivers have been destroyed. BRAGSA along with the Ministry of Transport and Works are continuing the assessment of the infrastructure (CDEMA, n.d.)
The Ministry of Health with technical support from PAHO conducted an initial damage assessment at the Milton Cato Memorial Hospital (MCMH) which was severely impacted by the flooding (CDEMA, n.d.)
[21] The immediate needs are mainly: hygiene kits, toiletries, mattresses, collapsible water containers, building materials, medical kits & equipment, generators, water tanks etc.

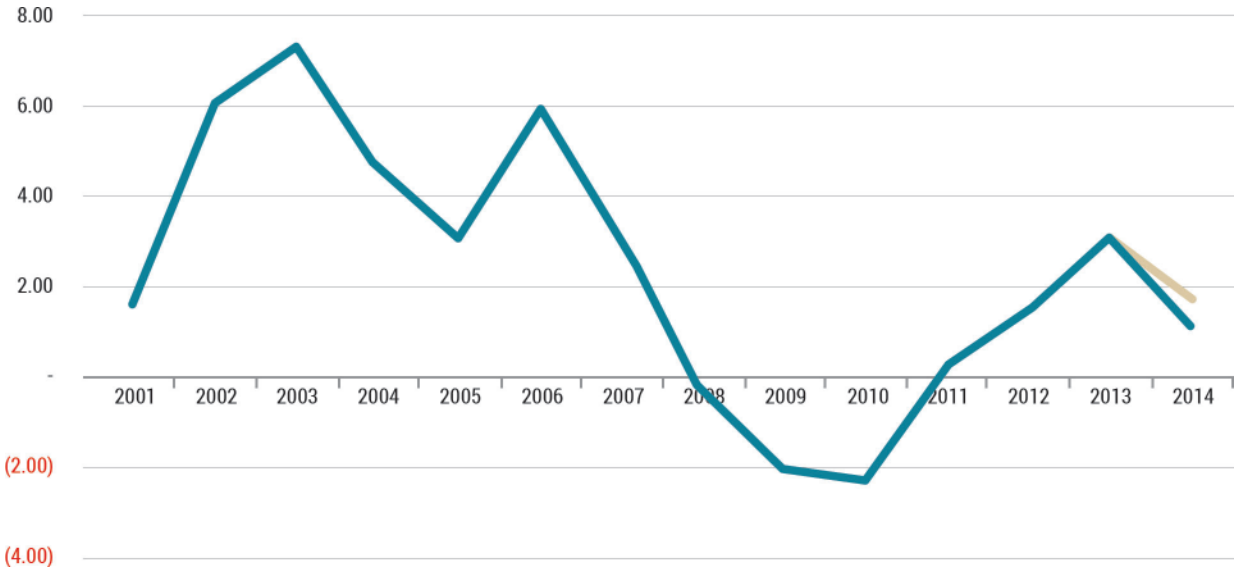
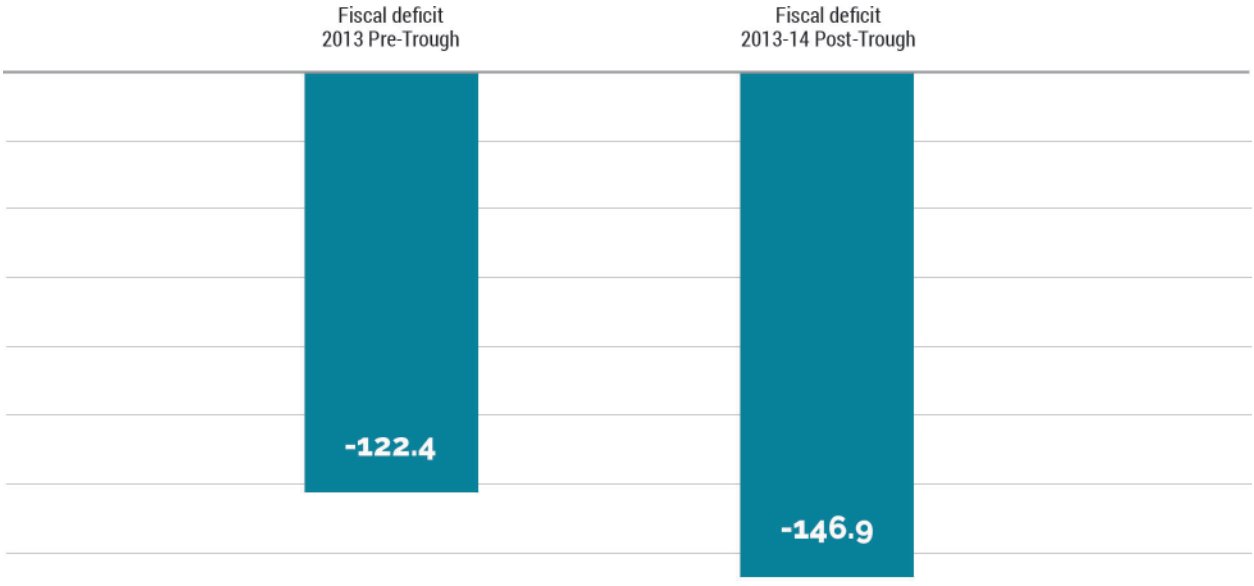


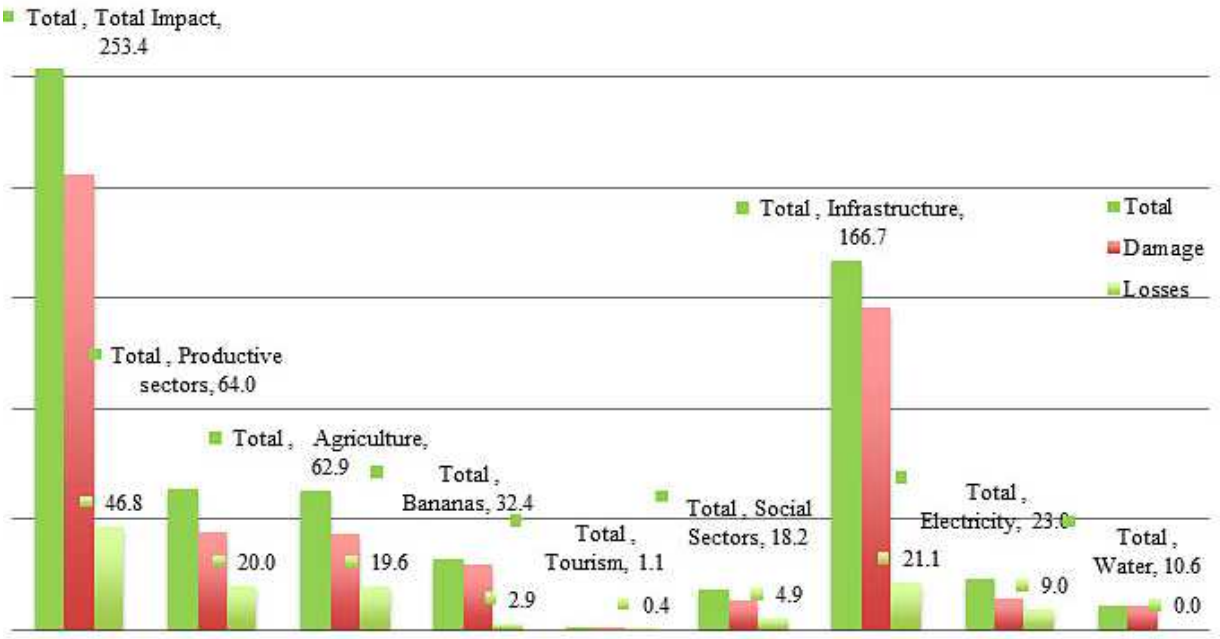
FIGURE 9: ECONOMIC IMPACT OF INCIDENT ON SVG GDP GROWTH (2010-2014) (SVG; UNDP, 2014)

Damage was set at EC$205.5 million. and losses estimated at EC $ 46.8 million. Figure 10 notes the effect per sector (NEMO, 2014). The infrastructure sector incurred by far, the most damage and losses.



Note: Effects include damages and losses.

FIGURE 10: THE TOTAL EFFECT OF THE INCIDENT WAS EC$254.40 MILLION (US$93.9 MILLION).



Note: Appendix F is a summary of damages and losses per sector.

FIGURE 11: TOTAL EFFECTS PER SECTOR

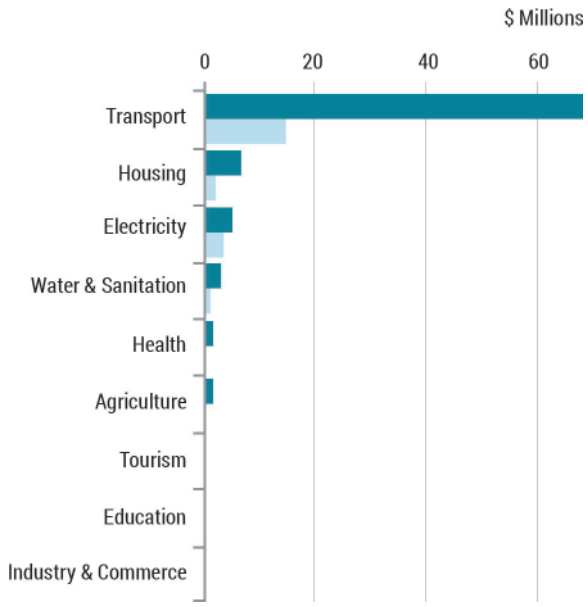


FIGURE 12: COST OF DAMAGES AND LOSSES PER SECTOR (US$)

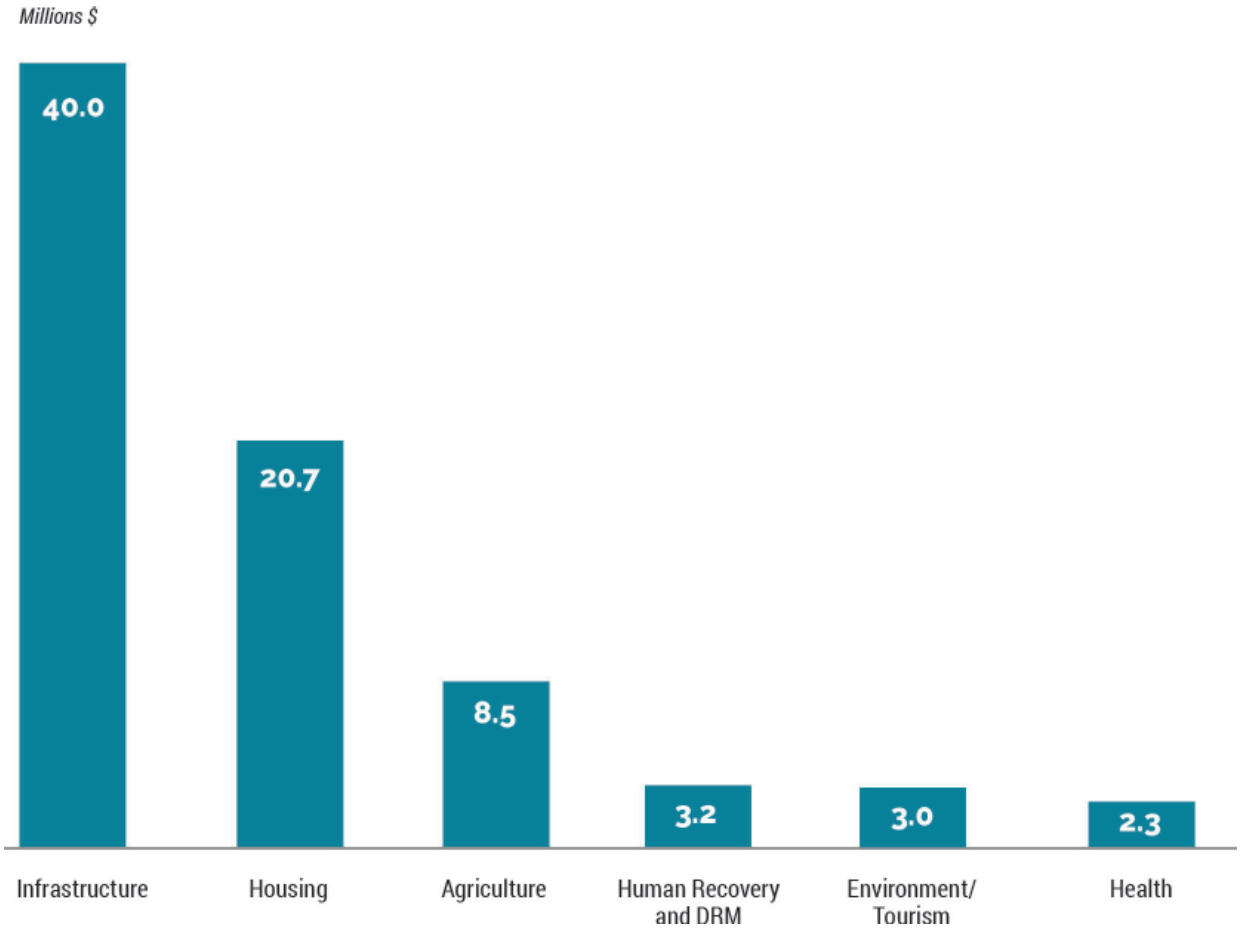
The forests have been substantially denuded; beyond 10% of the total forest area (Gonsalves, n.d.). In monetary terms, according to the Food and Agriculture Organization (FAO), the damage and loss to the forest was found to be EC$24 million and estimates of damage and loss to the agricultural sector to be EC $8.4 million.

Total Cost of Damages and Losses

All in all, the total cost of damage and losses was set at roughly EC$291. 4 million or US$ 59.2 million (over 15% GDP); see Figure 13 for the cost of damages and losses per sector.

Total Cost of Recovery and Reconstruction

The national cost of recovery was set at EC$ 77.6 million or US$ 28.7 million. The cost per sector for recovery is shown in Figure 14. Before August 2013, CCRIF noted that the most costly historical events occurred in 1898 (US$ .29 million); 2010 (US$ 0.00045 million). Had this report been produced four months later, the December 2013 incident would have been recorded as the most costly historical event for St. Vincent and the Grenadines.



Units: EC$ Millions. Source: UNDP, 2014

FIGURE 13: COST OF RECOVERY AND RECONSTRUCTION PER SECTOR (EC$)

2.3 IMMEDIATE AND PLANNED RESPONSES EMERGING FROM THE PDNA

NEMO[22] opened shelters and began relief supply distribution on December 25, 2013. A week later, the Central Water and Sewerage Authority (CWSA) was also trucking water into the affected areas and repairs were ongoing on various [water] systems. Access to all communities was restored and clean-up operations by the Ministry of Transport and Works were underway. Nevertheless, several roads were still inaccessible. By December 31, 2013, over 50,000 persons or roughly 50 % of the population were still adversely affected by extensive disruption of water supply (Gonsalves, 2014). Some relief activities and costs included:

- Provision of food (at no cost) for six months – EC$236,000 for shelters and EC$2.4 million for community.
- Donation of household appliances: refrigerators and stoves – $2.2 million
- Reconstruction of 25 houses in first phase – $20.4 million
- Provision of school uniforms for affected children - $225,000
- Repairs to the Milton Cato Memorial Hospital (Private - Public Partnership)

One month post event, the government listed the following [23]priority actions:

- Repair of the damaged houses, rebuilding those completely destroyed and relocating those which are in imminent danger.
- Replacement of stoves, refrigerators and mattresses for persons whose belongings were damaged or destroyed.
- Completion of the clean-up activity by relevant ministries.
- Reconstruction of destroyed or damaged bridges including those at: Caratal, Miss Jane, Belle Vue, Caro Point Ford (Sandy Bay), God-Save-the-Queen Bridge (Overland), London Bridge, Bottom Town Bridge (Owia), O'Brien's Valley, Vermont, Dark View, Top Sharpes (Chateaubelair), Kakarta (FitzHughes). Also, the installation of temporary Bailey bridges at several of these and other locations.
- Restoration of defences in the following locations: Buccament-Vermont , Spring, Teviot-Zenga Rivers, Sandy Bay, Fancy, Belle Isle, Dark View and South Rivers.
- Review of corrective action for pre-existing road and bridge projects at various locations including Mt. Young, the Congo Valley and Perseverance.
- Restoration and other infrastructural work on several miles of feeder roads particularly in North Windward, North Central Windward, South Leeward and North Leeward.
- Restoration of village and secondary roads in all affected areas.
- Reconstruction of the agriculture and livestock sub-sectors in the affected areas.
- Reforestation and behavior modification among irresponsible forest users.
- Restoration at the Milton Cato Memorial Hospital, the Central Water and Sewerage Authority and the St. Vincent Electricity Services.
- Assistance for reconstruction of impacted private businesses.

[22] Seven emergency shelters were activated and are housing and feeding 225 persons (CDMA, n.d.)
[23] Creation of Cash for Work Programmes; Implementation of the Return to Happiness Programme; Use of discarded materials (fallen trees) as part of livelihood generation; Establishment of home gardens; Development/review disaster plans for key sectors including education, tourism, health enhancement of general Early Warning Systems (EWS) ; Regularisation and upgrade of squatter settlements to guard against living in dangerous and unsustainable developments; Enhancement of the resilience of forests; mapping of flood plain boundaries for extreme events accounting for agricultural practices in upper catchmentsand Consideration of special design of water supply infrastructure adjacent to rivers.

The priority actions outlined by the Government of St. Vincent and the Grenadines are mainly physical in nature, addressing as far as is reasonably possible, the restoration of homes, personal shelters, livelihoods, critical lifelines, as well as the environment. Expectedly, actions are required beyond these set priority items. Short, medium and long-term actions were also recommended:

Short-Term Actions (one year):

1. Repair and clean-up damaged houses and infrastructure including roads, river protection works, drainage, schools and recover agriculture production.
2. Conduct a detailed post disaster needs assessment (PDNA) focused on livelihoods.
3. Conduct technical inspection of damaged infrastructure including a technical assessment of existing transportation, power, water and sanitation systems.
4. Develop or update the river basin flood risk maps and watershed calibration curves from Central Water and Sewerage Authority (CWSA), data collected since 2009.
5. Update the landslide susceptibility maps to include other interacting risks (i.e. flood, rockslide, mudslide, change of river course etc.) with particular attention to areas left unstable after the flood event.
6. Evaluate and ensure the effectiveness of operation and maintenance (and in some cases immediate improvement) of the drainage network, as well as efficient coordination between agencies.
7. Establish a standing parliamentary committee to investigate and develop risk transfer options with respect to government and private sector assets to prepare for dealing with future disasters. Consideration should include activities such as setting aside a capital reserve, (government self-insurance), purchase of insurance, insurance requirements for the private sector, formal support systems for low income citizens. It was recommended that this begin with a comprehensive multi-sectoral fiscal vulnerability analysis and an analysis of needs for periodic rehabilitation of public infrastructure to mitigate direct budget impacts of recurrent disaster events.

Medium to Long-Term Actions (1–5 years):

1. Address critical data gaps to generate hazard and risk assessment particularly with respect to hydromet monitoring systems.
2. Advance findings under risk transfer analysis to policy and/or legislation.
3. Formalise the national hydromet data management system and improve data collection (including telemetric reporting systems for all rainfall and stream gauges) building on the current system managed by CWSA developed under the Government of St. Vincent and the Grenadines/European Union water resources project.
4. Improve interagency data sharing and archiving and formalize the establishment of a national hydromet centre of expertise.
5. Identify and map annual, 10-year, 25-year, 50-year and 100-year flood plains.
6. Develop a land-use/land-cover map using criteria required as inputs to watershed and runoff modeling systems.
7. Incorporate watershed and flood risk management in the national land-use planning process.
8. Identify and act on the development of required legislation to manage land-use in high risk areas particularly in recurrent flood plain zones.
9. Adopt a watershed management legal framework.

10. Invest in transportation infrastructure and preventive maintenance and establish formal requirements for new infrastructure design with respect to expected service life and disaster resilience requirements (for example, survives 100 mile per hour winds, floods, seismic events)
11. Advance and adopt risk reduction-based building codes and strengthen training and enforcement.
12. Identify capacity gaps and provide tailored training for staff in key ministries in disaster risk management and response.
13. Install additional meteorological and stream gauging stations at a density to accommodate engineering scale analysis for design and planning.
14. Strengthen disaster monitoring and early warning systems.
15. Continue and expand public education with respect to hazard avoidance, particularly flood awareness.
16. Provide engineering and non-engineering solutions for vulnerable embankments in the upper watershed.

The short, medium- and long-term recommendations are all disaster risk reduction measures, complicit with the priorities of Sendai Framework (20015-2030). The majority of the short-term actions are ongoing, with first three activities noted as being complete and the establishment of the parliamentary committee to be done. Medium and long-term activities are ongoing (see Appendix G).

LESSONS LEARNED FROM APPLICATION OF THE PDNA

3

3 LESSONS LEARNED FROM APPLICATION OF THE PDNA

3.1 GENERAL WEAKNESSES

A number of observations from the implementation of the PDNA suggested areas of weakness in DRR efforts including but not limited to early warning systems and national preparedness. :

- Better preparation required for precipitation hazards.
  - Hazard risks and related vulnerabilities have to be known, understood and shared
  - Early warning systems are essential and need to be implemented.
  - Enhanced community-based preparations.
- Adaptation measures
  - Strengthen water harvesting and storage.
  - Implement mitigation measures in the housing sector.
- Protective agriculture
  - Explore resilient varieties and germplasm banks.
  - Improve plant varieties for higher production levels.
  - Improve planting techniques.
- Land Use Policy
  - Improve lands, water and river management.
  - Rehabilitate degraded forests.
- Infrastructure
  - Schedule regular maintenance of water supply and distribution network.
  - "Disaster proof" electricity generation systems.
  - Review design and criteria standards for road and drainage design to account for climate change related impacts.

Conclusively, DRR continues to encompass infrastructural works, inclusive of realignment of bridges, reconstruction of buildings, construction of river defence systems and retaining walls. Also, in the past, many communities have undertaken mitigation actions, with little advance planning, despite there being good intentions (NEMO, n.d.). Additionally, some decisions have been made on the spur of the moment following a disaster while other decisions have been made in advance without consideration to all options and their effects and/or contributing factors. NEMO notes that the results have been mixed often resulting in sub-optimal use of resources. Finally, policy and project choice emphasis has been on those yielding tangible results rather than the most strategic ones to achieve more sustainable and self-perpetuating results.

However, for SVG the focus changed post 2013 with the emphasis on the "soft" mitigation methods as opposed to "hard" ones. Moreover, there has been a recalibration of the physical elements of DRR and its social counterpart. Following the floods of 2013, NEMO was faced with having to understand the social dimension of impact, and thus in moving forward, find answers to this new dynamic it was confronted with.

The psychosocial, educational and personal needs of the people demanded this change. Notably, there was a great call for psychosocial service providers. Social community centres were stood up and schools were even utilised as facilities for counselling. Counsellors were also reported to be living among the affected population groups. NEMO's work with its social services providers focussed on the specific needs of single-parent families (particularly those headed by females) and the elderly. Nevertheless, there was a need for more efforts to address cross-cutting issues such as vulnerability, whether by age or sex.

3.2 TWO MAJOR WEAKNESSES AND OVERSIGHTS

Gender Sensitivity Mainstreaming

Once the damage assessment reports were analysed, it was determined that there wasn't a clear understanding of gender sensitive issues that actually arose, nor was environmental sustainability sufficiently addressed. The specific weaknesses in the reports due to lack of information, lack of data quality or non-collection of information included:

- Lack of attention to gender issues with regard to access, ownership, control and use of physical, natural and financial assets that may be crucial to have an adequate overview of how the livelihood and food security of women and men were affected by loss of property, productive resources and communal infrastructure.
- Failure to identify communal spaces such as markets and childcare centres and gathering spaces frequented by women/ children/ elderly etc. Community ownership of communal infrastructure, etc. must include management arrangements that equally involves women, men and the diverse community.
- Confirmation that women are highly engaged in subsistence farming (backyard economy) or the informal sector through micro-enterprises. The loss of assets and crops, decreased demand or increase in community work as a consequence of the disaster may directly affect income and food security. Injury to income earning family members may also have this effect and increase vulnerability.
- Missing information on gendered livelihood. For example, whether women predominate in service sectors such as tourism where demand for services decreased after the disaster.
- Absence of information on financial flows or losses stemming from outstanding debts or loans of women. The loss or damage of goods purchased through formal or informal credit should be included under damage of property and/or housing. Another aspect of changes in financial flows is the possible loss of women's access to social welfare programmes.

The following recommendations were presented by the PDNA assessment team[24], for gender-awareness in disaster management and response:

- Strengthen the data collection processes in the post disaster situation to ensure that sex disaggregation of the data is possible.
- Investigate further the differential impact of the December event on men and women in the informal economy and the measures that may be necessary to support the development of sustainable livelihoods.
- Develop knowledge of gender analysis within all line ministries, particularly in the Department of Gender Relations.
- Ensure that the Department of Gender Relations is involved in all aspects of risk reduction and building back better, so that the different vulnerabilities of women and men can be addressed.

Following these recommendations, in 2014, CDEMA hosted a training course for the participating states for the roll-out of DANA. The initial human needs assessment was introduced as a component of the DANA process to facilitate the identified gap.

[24] The PDNA team members were as follows: Asha Kambon – team leader / livelihood; Michael Hendrickson (UNECLAC) – Macroeconomist, Commerce; Erik Blommestein – Tourism, Commerce & Environment; David Smith – Infrastructure; Jacqueline Massiah - Gender and Social Assessment; Vincent Little – Agriculture; Lorraine Nicholas (OECS) – Tourism; George Alcee – (OECS) – Agriculture; Ian King (UNDP) – Disaster Risk Management.

OPPORTUNITIES

4

4 OPPORTUNITIES

4.1 GENDER MAINSTREAMING AND CLIMATE CHANGE

In recognising a new approach to gender and climate change, in 2015, the draft Comprehensive Disaster Management Policy (CDM) established a multi-sectoral approach to disaster management that allows for the integration of disaster risk reduction, gender equity and climate change adaptation (GOSVG, 2015). The government is intent on infusing gender-sensitivity and climate proofing into all strategic plans, utilised by all sectors. Even so, the SVG NDO has echoed these intentions but as with all processes, NEMO has re-affirmed that this will take time.

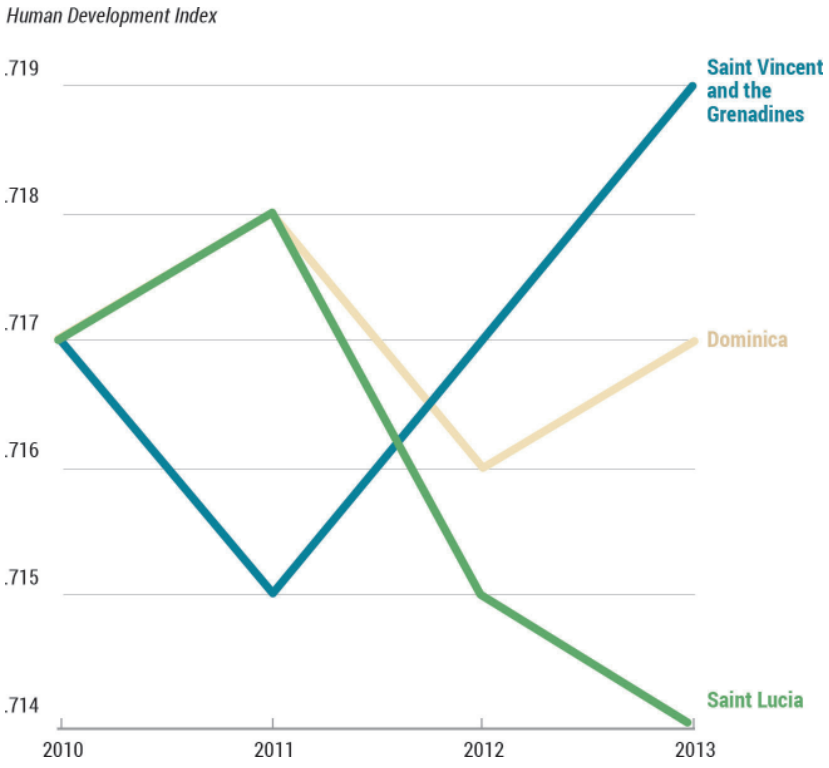


FIGURE 14: TRENDS IN ST. VINCENT AND THE GRENADINES, ST. LUCIA AND DOMINICA HDI (2010-2013).

In 2013, the Human Development Index (HDI) for St. Vincent and the Grenadines was 91/187 or HDI value of 0.719. This is a rank shared with China, but below the HDI for fellow central sub-regional nations like Barbados (59/187 or HDI value of 0.776); St. Lucia (97/187 or HDI value of 0.714) and Dominica (93/187 or HDI value of 0.717); see Figure 15, (UNDP, 2014; n.d.). This ranked value is ranged along a number of 187 countries. The HDI is noted as a summary measure for assessing long-term progress in (a) a long and healthy life (b) access to knowledge and (c) a decent standard of living. Further to this index are other indices that provide a more in-depth view of human achievement. In ranking gender, the better instrument may be the Gender Inequality Index (GII), ranking 149 countries and the Gender Development Index (GDI) among 148 countries.

The GII is a composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labour market (UNDP, n.d.). There was no recorded GII for Dominica, St. Lucia or St. Vincent and the Grenadines, but there exists for their regional counterpart, Barbados (66/149). For SVG, Dominica and possibly St. Lucia, a lack of relevant data, resulted in no determined value. Barbados received a value of 0.350, just above the average for high HDI countries (0.315)

The new GDI measures the gender gap in human development achievements in three basic dimensions: health, measured by female and male life expectancy at birth; education, measured by female and male expected years of schooling for children and female and male mean years of schooling for adults ages 25 and older; and command over economic resources, measured by female and male estimated earned income. Like the ranked results for GII, in 2013, Barbados (32/148) was the only ranked nation in the central sub-region. For St.Vincent and the Grenadines, Dominica and possibly St. Lucia, a lack of relevant data, resulted in no determined value. Barbados received a value of 1.012, just above the average for high HDI countries (0.946). As GDI can also be considered as a ratio of female to male HDI values, the values for Barbados are high.

The GII and GDI values may be twice that of Barbados, within a range of 54 and 60. Moreover, granted that HDI difference values between Barbados and its central sub-regional counterparts are approximately 0.06, it may be suspected on this rational that GII and GDI values for St.Vincent and the Grenadines, St. Lucia and Dominica may be less than average.

The observation of the UNDP is that countries with high gender inequality also experience more inequitable distribution of human development. The same pattern may hold, that is, countries with a high GII may have a low, GDI. Thus, two interesting points should be noted:

1. While St.Vincent and the Grenadines may have a high HDI, the value (0.719) is below the average value (0.735) for nations in the high HDI group, and below the average (0.740) for Latin American and Caribbean countries.
2. Human achievement is undermined as developmental effects are lost due to existing inequalities evident by the statistics.

All the same, data retrieved following the assessment of the affected populace of 2013, bear record of the need for gender-sensitive information. A summary report of the persons affected called for a more detailed social assessment on the impact on gender to determine the full impact of the disaster.

Of the data that exists, it is revealed that 53 percent of the unemployed are young females; and interestingly, according to the Government of St. Vincent and the Grenadines, most senior public servants there are females. It adds that in accordance with signed international treaties and conventions for the protection and empowerment of women, the Gender Affairs Division was renamed the Women's Desk in 2001s. In addition, the Family Court (FC) was established in 1995 to improve avenues for women to be provided recourse.

For disaster risk management, the CDEMA initiative for assessment revision, ensuring consideration of gender-related impact and needs is a start for all participating states, inclusive of St.Vincent and the Grenadines. Nevertheless, gender mainstreaming requires more and is applicable to times of incident and times without. An all-society and whole of government approach is necessary to create intent towards gender inclusions that will underscore all developmental strides of the nation. More than this, efforts need to be country specific.

The PDNA report (SVG; UNDP; 2014) notes that in St Vincent and the Grenadines, as with other countries in the OECS region, female single-headed households fall within the poorest and most vulnerable of the population. St. Vincent and the Grenadines was found to have a particularly high proportion of households that are headed by females. Some 52.1% of all households are headed by women according to the County Poverty Assessment (CPA) reports. The segmentation that exists in the labour market leads to well-defined male and female jobs. This combined with the fact that women's jobs are often lower paying than men's jobs results in female-headed households facing precarious living conditions. The St. Vincent CPA suggests that high proportions of female-headed households can be found living below the poverty line or just above it. In the case of any shocks, economic or in this case the result of a natural event, it is likely that these will be the most heavily impacted households (Pelling and Uitto, 2001; Cannon, 2008; Shah et al., 2013). Additionally, the Country Poverty Assessment of 2007/08 indicated that 18% of the population was at risk of falling into poverty. Further, the CPA indicated that single-parent headed households, and multi-generational households, especially those headed by women, were the poorest. Visits to the communities and shelters support this finding, since the majority of shelter residents were women with children.

It is critical that all planned projects actively reflect the gender-sensitive application, for example, the use of various early warning systems in the Vincentian Community Alerts Projects and the preparation of adult and young males and females with implements that differ based on how the gender groups are likely to adopt or integrate.

In concert with the efforts of the tripartite partnership of the European Union (EU), the United Nations Development Programme (UNDP) is working to ensure that the internationally accepted methodology triggers more resilient and inclusive long-term recovery and reconstruction, prioritised processes (GFDRR, n.d.). GFDRR provided a rapid damage and loss assessment within two weeks which helped the government to raise $19 million in disaster aid from international donors.

The injection of local, national and international resources provides opportunities for development. These periods are markedly presented in challenging times. Following the December 2013 floods , the [25]PDNA reports noted that a moment for development was presented, in particular, to create a robust recovery and reconstruction framework, that will provide a sequenced, prioritised, programmatic, yet flexible action plan to guide the recovery and reconstruction process that is anchored in disaster risk management, specifically flood risk management (GFDRR, 2014). The framework is presented on the section Towards Recovery and Reconstruction, above are recommendations provided following the 2012 incident.

[25] St. Vincent and the Grenadines was the third country in the Caribbean assessed via the PDNA tool, after Haiti in 2008 and 2010.(Is 2010 correct? The third country was not named.)

Three years prior to the December 2013 flooding and landslide incidents, St. Vincent and the Grenadines benefited from the Hurricane Tomas Emergency Recovery Project (HTERP). The investment focused on increasing resilience of the physical infrastructure, inclusive of functional considerations such as introducing gender-specific restrooms for reducing gender-based violence and improving disabled access at shelter facilities (World Bank, 2014). HTERP also aimed for institutional strengthening and hazard and risk analysis, as well as project management and implementation support. By the end of this project, the following results were noted:

- NEMO and the Ministry of Housing, Informal Human Settlements, Lands and Surveys and Physical Planning (MoHILP) officials completed the Geographic Information System (GIS) training and are now able to independently produce location specific exposure maps.
- Three hazard maps have been produced by the government under the project for volcanic, landslide and storm surge hazards as well as four additional community specific hazard map models.
- All community members targeted have access to safe emergency shelters with gender separated bathrooms and shower facilities.
- All emergency shelters targeted under the project that have male and female bathroom facilities have been rehabilitated/reconstructed.

The larger and more recent Regional Disaster Vulnerability Reduction Project (RDVRP) operation particularly prioritised the most vulnerable groups, namely poor communities lacking access to emergency shelters as well as those needing gender-segregated washrooms and disability ramps.

4.2 CONSTRAINTS

Historical data indicates that in the Eastern Caribbean, the regional probability of a hurricane in any given year is about 18% which underscores the need for disaster risk reduction and emergency preparedness (World Bank, 2014). Moreover, specifically for St. Vincent and the Grenadines, while hurricanes are not as frequent as wind hazards, floods produce a much greater degree of impact and are a natural, resultant, by-product of hydro-meteorological activity. In addition to the external factors negatively prevailing upon the country the vulnerability of St. Vincent and the Grenadines to natural hazards has been exacerbated by its deeply dissected topography, making the country prone to flash flooding and landslides (World Bank, 2014).

The lack of strategic responsiveness has also led to diminished resilience. Disaster events have resulted in significant expenditures, generally not accounted for in the national budget, thus constraining economic growth (World Bank, 2014). Further to this, SVG has had catastrophic insurance for hurricanes and earthquakes with the Caribbean Catastrophic Risk Insurance Facility[26] (CCRIF), since the inception of the facility in 2007, but the 2013 event did not generate wind speeds significant enough to trigger a CCRIF payout under its tropical cyclone policy coverage. The Caribbean Development Bank (2014) opines that had the Government of St. Vincent and the Grenadines procured policy cover under CCRIF's new excess rainfall product, it may have been eligible for a payout dependent on the rainfall parametric trigger points selected under such policy coverage.

[26] CCRIF is a risk pooling facility, owned, operated and registered in the Caribbean, for Caribbean governments. It is designed to limit the financial impact of catastrophic hurricanes and earthquakes to Caribbean governments by quickly providing short term liquidity when a policy is triggered (CCRIF, 2013). CCRIF is now known as CCRIF SPC.

About a decade earlier, Culzac-Wilson documented her observation of causes for the frustrated efforts of disaster risk reduction, gender mainstreaming and climate change adaptation; these are recorded below in Table 4. A number of these cognitions of 2003 remain as perceptive as ever, for advancement of the underlying risk factors that need to be addressed. Nevertheless, there are many that no longer remain areas of concern or some measure of improvements have been made, as this assessment was done a year after the inception of NEMO.

Furthermore, there are challenges of data capacity, quality and management at the national level (CDB, 2014). This was observed during efforts to calculate 2013 GII and GDI values for the country. Still, contrary to this, the Hurricane Tomas Emergency Recovery Project (HTERP) would have provided the opportunity for the enhancement of hazard and risk analysis. The evidence noted was the production of hazard and exposure maps[27] which were prepared for St. Vincent but not for the Grenadines (DIPECHO LAC, 2014). The DIPECHO LAC country profile reveals that although most of the hazard prone vulnerable areas of the island are known, there is an absence of community hazard maps that delineate hazard zones, safe areas, escape routes and shelters. Vulnerability studies have been done for a few communities but a national community vulnerability assessment tool is missing.

There are organisational hindrances that curtail the best of efforts. NEMO's personnel is active in all of these areas nationally - training staff in government departments as well as community organisations; providing warnings on all forms of media; coordinating disaster management efforts and leading the execution of damage and loss assessment (DALA) and in warehousing. However, there are financial and human resource constraints. Equipment and supplies are lacking. Additionally, technically-trained personnel are needed at the organisational and community level (DIPECHO LAC, 2014).

[27] The maps of St. Vincent include storm surge maps with various return periods, also maps for landslide prone areas, volcanic hazard; flood risk maps with infrastructural assessment and some engineering designs.

TABLE 3: COMPARISON OF CONSTRAINTS NEAR NDO INCEPTION AND BEYOND NDO INCEPTION

	NDO Inception	
	Near	Beyond
Disaster Risk Reduction (DRR)	Lack of clear policies on disaster management. Separation of Disaster Management from Development Planning. Ineffective public education programmes. Absence of capacity building for comprehensive disaster management. Absence of a reliable database for assessment (Risk maps, hazard maps etc.). Exclusion of stakeholders from some initiatives.	Two (2) draft policies exist: the hazard mitigation policy and the comprehensive disaster management policy. Disaster management has become embedded in development planning via the National Economic and Social Development Plan 2013–2025. Public education programmes are effective. There is capacity building for comprehensive disaster management, albeit the resources are strained given the small staff at NEMO. There's need for more stakeholders to demonstrate partnership with NEMO and acknowledge ownership of operations that are part of their functional occupation. Presence of a reliable database for assessment. However further development of the database is required. Stakeholders have been included but the degree of accountability and responsibility required of the partnership can be enhanced.
Gender	Lack of funding to support consultations and foreign facilitators/consultants necessary to execute programmes and projects. People have not yet come to grips with understanding gender and what it means. Staff limitations – Lack of manpower to execute the department's work. Lack of office equipment including computers and software packages.	International funding to support consultations and foreign facilitators/consultants necessary to execute programmes and projects may not prove to be a challenge, but the real challenge is lack of national funding. This is due to the reliance on Whilst conversations exist about mainstreaming gender, and cognitive awareness of the importance of gender inclusion is present, as well as the intent for mainstreaming, there is need for implementation.[28] Staff limitations remain a concern. There is no lack of office equipment including computers and software packages.
Climate Change	Lack of national public education strategies to address issues of climate change and the general environment. Limited understanding of the magnitude of possible impacts. Absence of suitable predictive models for small islands. Lack of appropriate technology and financing for small islands.	There are public education strategies to address issues of climate change and the general environment; nonetheless, community-level awareness can be improved. Limited understanding of the magnitude of possible impacts. Given the work of CIMH and five Seas, there is ongoing work to secure predictive models for small islands. Given the work of CIMH and five Seas, there is ongoing work to secure predictive models for these islands.

[28] A strategy recorded in the draft CDM Policy (2015) is the creation of guidelines to allow assessing and addressing of gender issues. Also, stakeholders will recognise the need for gender equality and ensure equity in participation and in sharing benefits across all segments of affected populations. Community resilience will be enhanced for the most vulnerable, with gender concerns addressed at all stages and levels (GOSVG, 2015).

RECOMMENDATIONS

5

5 RECOMMENDATIONS

Plan PDNA with gender as a core theme, not an addendum. The Post-Disaster Needs Assessment (PDNA) estimates the social and economic impact of the event at both the macro and micro levels. The economic and human impact analysis identifies the gap between the pre-disaster scenarios in terms of economic and human development indicators, poverty, employment and personal and household income and other human development indicators in terms of health, nutrition, education, access to social services, gender equality and social development goals. The analysis of the impact of the disaster provides medium and long-term projection of the effects on the sector. The impact analysis forms the basis of the recovery and reconstruction strategy.

The PDNA must ensure gender integration across four levels: (1) pre-disaster, (2) effects of disaster including economic damage, (3) impact on macro-economy and human development, (4) build back better considerations. A gendered analysis of the human development impact ensures that assumptions used to forecast human development performance into the future, take into account gender equality trends. For example, disasters can have long-term and cumulative implications on the education of girls in affected communities. Since disasters often erode the resource base of households, education of boys might be prioritised over girls. A gendered analysis can provide the additional sector teams with trends on past performance related to gender equality in general. If information is available, that can then inform the forecasts of impact of the disaster for the individual sector.

Make PDNA relevant to the realities of local gender contexts. The development of the overall gendered recovery strategy must be relevant to women's realities. This can be achieved by including women's organisations in the formulation and, if available, incoporating national gender policies and strategies.

There should be consultation with relevant stakeholders, including women's groups and community organisations. These groups have knowledge of and credibility within the communities as well as networks and insights that can facilitate gender analysis. Women's groups may also be able to assist in identifying hidden needs that both women and men may not raise in front of outsiders. Women's inclusion must, therefore, be sought proactively. PDNA should facilitate the connection with gender stakeholders.

PDNA must also inform gender equality in Recovery Strategy and Plans. The gender analysis will bring out gaps and needs that are sector-specific as well as cross-cutting. Building Back Better (BBB) concerns not only rebuilding and improving infrastructure, restoring systems and promoting resilient livelihoods, but also seizing opportunities to rebuild in a way that is inclusive of women, girls, boys and men from the affected population. PDNA can identify opportunities to improve post-disaster conditions through recovery interventions. Gender equality-targeted interventions should focus on a limited number of strategic and realistic actions that will have the widest potential impact on the recovery of affected men, women, boys and girls. These choices should be made based on available resources, the capacity of partner government to implement and the socio-cultural context.

Link damage to infrastructure and physical assets to gender and diversity equity. Revisiting Figure 4a, also re-presented below as Figure 16, vulnerability (socio-economic and vulnerable groups) is expected to decrease, while hazard and exposure, and lack of coping capacity will be unchanged (the trend lines of Figure 17[29] demonstrates this). Indeed, St. Vincent and the Grenadines has been active in building and maintaining infrastructural and institutional capacities, as well as seeking to enhance resilience among all the people. In addition to the improvements post-NEMO inception, the Government of St. Vincent and the Grenadines has been able to develop building code legislation as well as conduct standardised vulnerability assessments of the health sector (CDB, 2014). Moreover, NEMO has been successful in increasing public awareness of natural hazards and the need for individual and household preparedness (CDB, 2014).

	Value	Rank	Trend (3 years)
INFORM Risk	1.8	161	⇨
Hazard & Exposure	0.9	168	⇨
Vulnerability	2.0	131	⇩
Lack of Coping Capacity	3.5	139	⇨

FIGURE 15: RISK DIMENSION VALUES FOR ST. VINCENT AND THE GRENADINES (INFORM, 2015)

Build Back Better is an opportunity for holistic planning including gender issues. The opportunities the Vincentian Government has been able to access seem to have been thoroughly exploited. Yet, of these project opportunities Culzac-Wilson (2003) warns, that despite these many opportunities for building back better, the Government of St. Vincent and the Grenadines has not addressed sustainable development in a holistic manner. Instead, it has a piecemeal approach that unwittingly has undermined long-term planning, thereby undermining the best intentions of the government, aid entities and contributing donors.

Gender mainstreaming into DRR must be framed as macro-economic and human development issues. The Government of St. Vincent and the Grenadines recognised the need for a defined and concerted way forward, demonstrated by the creation of the National Economic and Social Development Plan 2013-2025 (DIPECHO LAC, 2014). This plan has five goals including "Improving Physical Infrastructure and Preserving the Environment". The framework speaks to a sustainable and resilient development path that relies on 'a technologically advanced work-force'.

It is this plan that needs to more clearly demonstrate and advise on the integration of gender-sensitive operations and climate-proof development, for successful execution within the various targeted societal contexts.

[29] Figure 17 indicates the trends of hazard and exposure, vulnerability and lack of coping capacity from 2011 to 2015.

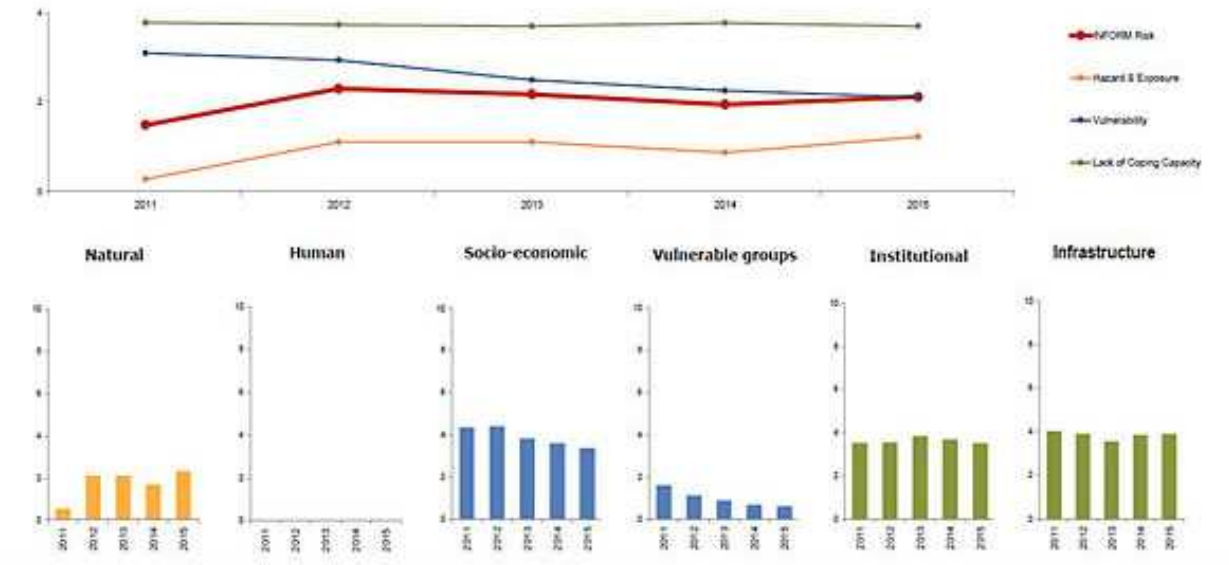


FIGURE 16: TRENDS – 2011-2015 (INFORM, 2015).

This enhances the value of the various assessments as accurate and complete representations, (incorporating all relevant data-drivers) which support more precise and intuitive recommendations.

Build national/ local capacity in gender sensitivity issues. One caveat might be cautious reliance on the external and available resources, derailing focus on the internal strengths that can remain untapped and undeveloped. The Government of St. Vincent and the Grenadines has been able to access technical expertise and financial aid to build coping capacities, however potential for accelerated growth, beyond the kinks of exogenous resources, retards the building of local expertise. National capital has been expended for training, public education and information activities, but the other capacity areas have not similarly benefited. Thus, where project activities should be sustained and become operational, extending to untargeted communities and other groups, there are diminished chances for sustained endeavours, to the extent that project-inspired capacities are undermined.

All assessment processes and associated tools must be mapped to complement and cross- integrate gender sensitivity to work effectively and be sustained. Looking specifically at enhancing response mechanisms and the subsequent ability to satisfy and exceed the needs and expectations of affected people, assessment processes and associated tools need to be mapped, such that the elements of each assessment stage: IDA, DANA, DALA and MIRA, provide outputs that fulfill the content requirements of the final product (the [30]PDNA). Gaps should be identified and addressed by a multi-disciplinary stakeholder team, ensuring that cross-cutting and emerging themes are incorporated into the tool and that PDNA results can also support DRR planning. NEMO intends that by 2016-2017, there would have been a re-examination and revision of all assessment tools and associated processes, in association with CDEMA and CDB. It is advised that all NDOs will embark on such an exercise collectively, in collaboration with CDEMA. By this means, assessment tools utilised in the Caribbean region will be standardized, across all assessment stages. This action will allow necessary intra-regional assessment activity, demanded by the regional response mechanism, to be performed in a timely and concerted manner.

If implemented, these recommendations can provide a sustained and cohesive basis for addressing underlying risk factors. Moreover, a national platform for internally robust, cooperative and self-propagating resilience will be created.

[30] A GFDRR review of its post-disaster needs assessment portfolio since 2007 pointed to a need to institutionalise —before a disaster strikes—the key government functions that will be needed during recovery, such as specific social, infrastructural and productive sector recovery strategies, allowing each to identify key constraints to normal functioning during a disaster (World Bank, 2014).

CONCLUSIONS

6

6 CONCLUSIONS

About three years have passed since St. Vincent and the Grenadines was impacted by the Christmas Floods, in December 2013. This catastrophic incident has rallied financial and technical support for recovery and reconstruction. In the past, St. Vincent and the Grenadines benefitted from injections of resources for bounded resilience. Great strides have been made with the advent of NEMO. These gains have resulted from international assistance and NEMO is also aware of the need to mainstream sustainability, climate change adaptation and gender sensitivity into all plans and policies.

The introduction of the post disaster needs assessment (PDNA) to the Caribbean has been a welcomed experience that has required the regional assessment processes and tools to be revisited. The PDNA tool (and its related processes) therefore serves as an internationally acceptable benchmark that compels the affected state to go beyond the quest for recovery and reconstruction, to a benefactor's desire to aid efforts towards sustainable development. Pursuant to the assessment recommendations (i.e. if they are followed), St. Vincent and the Grenadines would have increased its coping capacity, via considerable disaster risk reduction strategies. Since the event, St. Vincent and the Grenadines has built national resilience to save lives, safeguarded livelihood, preserved the environment and provided a more stable platform for economic growth.

St. Vincent and the Grenadines has also embraced and endorsed the PDNA processes, so too has the Caribbean Disaster Emergency Management Agency (CDEMA). The regional entity has taken active note of the inadequacies of existing assessment tools and processes and has moved to ensure that assessment outputs are consistent with fact and reality; socially, economically and environmentally considerate; and intuitively exploits multi-functional relationships. Gender sensitivity mainstreaming into PDNA is actively being considered and undertaken, which is a positive development for the region.

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APPENDICES

Appendix A: Statistics (Risk) for St. Vincent and the Grenadines

Table B1: [31]Probabilistic Risk Results: Average Annual Loss (AAL) by hazard (UNIDSR, n.d.)

Hazard	Absolute (Million US$)	Capital stock (%)	GFCF (%)	Social exp (%)	Total Reserves (%)	Gross Savings (%)
Multi-Hazard	24.49	0.926	13.928	65.746	18.128	-53.03
Storm Surge	15.11	0.571	8.594	40.564	11.185	-32.722
Wind	6.58	0.249	3.742	17.665	4.871	-14.250
Earthquake	2.79	0.105	1.587	7.490	2.065	-6.042
Tsunami	0.01	0.000	0.006	0.027	0.007	-0.022

Table B2: [32]Probable Maximum Loss (PML) - Mean return period in years - Values for hazard are in million US$ (UNIDSR, n.d.)

Hazard	20	50	100	250	500	1000
Storm Surge	58	186	462	591	616	666
Wind	21	92	119	396	517	622
Earthquake	4	14	38	119	231	378
Tsunami	0	0	0	0	0	0

Table B3: Exposure to Volcano

Number of volcanoes	1
Total population living within 30km from a volcano	100,414
% of population living with 30km distance from a volcano	97

[31] The Average Annual Loss (AAL) is the expected loss per annum associated to the occurrence of future perils assuming a very long observation timeframe. It considers the damage caused on the exposed elements by small, moderate and extreme events and results a useful and robust metric for risk ranking and comparisons.

[32] The Probable Maximum Loss (PML) is a risk metric that represents the maximum loss that could be expected, on average, within a given number of years. PML is widely used to establish limits related to the size of reserves that, for example, insurance companies or a government should have available to buffer losses: the higher the return period, the higher the expected loss. PML always have associated a mean return period.

Appendix B: Situation Report (SITREP) Six (6) [Extract]

Based on Situation Report (SITREP) Six (6) –Assessment continues following heavy rains from trough systems on 24th – 25th December, (NEMO, 2013), disaster areas with a combined impacted population of 13,029 have been declared for:

- The Vermont Valley, all the way down to Buccament Bay (including the villages of Francois, Retreat, Hog Hole, Cane Grove, Penniston and Pembroke). This area has a combined population of approximately 4,684 persons.
- Spring Village, Rose Bank and Dark View on the Leeward Side (including the villages of Petit Bordel, Chateaubelair, Fitz-Hughes, Richmond Vale, Spring Village, Gordon Yard, Cumberland and Troumaka). This area has a combined population of approximately 5,731 persons.
- South Rivers, with a population of 1,213 persons.
- O'Brien's Valley- Georgetown and Spring Village - Georgetown with a population size of 1,401 persons.

Appendix C: Preliminary Assessment (Gonsalves, 2014)

1. The actual material damage to 662 houses is estimated at $24.6 million. Assuming that relocation of 300 of these houses is to be done, the cost to the housing sector would be an estimated $45 million.
2. The clean-up cost to be incurred by the Buildings, Roads and General Services Authority (BRAGSA), $5 million.
3. Damage and loss to the Milton Cato Memorial Hospital (MCMH), $5.5 million.
4. Damage and loss to Central Water and Sewerage Authority (CWSA), $12.0 million.
5. Damage and loss to St. Vincent Electricity Services (VINLEC), $23 million.
6. Damage and loss to private sector businesses, outside of agriculture, $5 million.
7. Damage and loss to the agricultural sector, livestock and fisheries, $8.4 million [over 1,100 farmers].
8. Damage and loss to the physical infrastructure [roads, bridges, river defences, two police stations], $221.1 million.
9. Damage and loss to forest, $24 million.
10. Estimated cost of damage and loss to household items, $7 million.
11. Estimated cost of providing relief/humanitarian support to affected families for 6 months, $2.4 million.

Appendix D: Summary of Damage and Loss Assessments per Sector

Table F1: Summary of Damage and Loss Assessments per Sector (ACP-EU, 2014)

		Disaster Effects (US$)				Disaster Effects (EC$)		
		Damage	Losses	Total	%	Damage	Losses	Total
	Sector							
Infrastructure								
	Transport	$67,868,392	$14,733,755	$82,602,147	76%	$182,443,811	$39,607,282	$222,051,092
	Housing	$6,799,830	$2,339,169	$9,138,999	8%	$18,279,303	$6,288,154	$24,567,457
	Electricity	$5,207,946	$3,347,965	$8,555,911	8%	$14,000,000	$9,000,000	$23,000,000
	W&S	$3,148,999	$1,319,835	$4,468,834	4%	$8,465,140	$3,547,981	$12,013,121
Social								
	Health	$1,830,965	$221,952	$2,052,917	2%	$4,922,000	$596,651	$5,518,651
	Agriculture	$1,372,666	$0	$1,372,666	1%	$3,690,000	$0	$3,690,000
Productive								
	Tourism	$118,739	$52,675	$171,414	0%	$319,195	$141,600	$460,795
	Education	$0	$15,000	$15,000	0%	$0	$40,323	$40,323
	I&C	$0	$6,000	$6,000	0%	$0	$16,129	$16,129
Total		**$86,347,537**	**$22,036,351**	**$108,383,888**	**100%**	**$232,119,449**	**$59,238,120**	**$291,357,568**
		80%	20%			80%	20%	

**All Ministries and agencies are still in the process of analyzing and quantifying their losses; as a result total losses are expected to increase in each sector.*

SUPPLEMENTAL INSTRUCTIONAL GUIDE

Case Usage

This case can be used to supplement several lesson plans relating DRR to climate change adaptation, gender sensitivity and environmental sustainability. The topics covered include the concepts of risk, vulnerability and resilience at the country level; introduction to the regional disaster response mechanism; environmental impacts in the short, medium and long term; the application of impact needs assessments and post disaster needs assessments; gender mainstreaming and feeding lessons learned back into disaster risk reduction processes.

This case particularly utilises a detailed description of a particular climate induced extreme weather event of Christmas 2013 (Low trough event) to illustrate how an important assessment tool was utilised, the results of its utilisation and how it could be improved, especially with respect to better coverage of gender sensitivity and environmental issues.

As a supplemental instructional resource, this case can be integrated into lesson plans for disaster risk reduction related courses and workshops. It is useful to students in related undergraduate and graduate courses; to practitioners and policy makers and to community and civil society groups. Below, guidance is provided on the substantive academic coverage this case study offers, which can be closely linked to theoretical concepts.

User Groups

Practitioners

At several points in this case study, practitioners will find the material to be engaging. The central feature of the post disaster needs assessment illustrated how this instrument can be used to achieve the goals of rapid assessment and more detailed insight. It also critically identified several strengths and weaknesses with the methodology and how possible weaknesses such as lack of gender sensitivity can and have been overcome. There are other interesting practical themes that include how to proritise disaster costs and remedial actions in short, medium and long-term strategies, the factors that trigger the regional response mechanism and calculations of risk, vulnerability and resilience.
Policy users

Policy analysts are presented with several case aspects to consider. The case can be used to critically examine how the regional response mechanism policy worked in this particular event, including the responsibilities and expectations of action from governmental and non-governmental partners. Another aspect for policy analysts is feeding the results of the impact assessment back into disaster risk reduction processes as well as considering if and how the assessment results can be the basis for policy reform. For instance, policy reforms to support post disaster rehabilitation needs in the short, medium and long term, which will include not only immediate remedies but longer term infrastructural commitments. This case is particularly useful in highlighting for policy analysts how and why gender sensitivity should be integrated at the policy level, so that practical tools such as the PDNA consider this centrally to begin with and not as an addendum.

Community and interest groups

The case will also appeal to learners in civil society and community groupings. First, it provides insight as to how the impact assessment tools are used, specifically as it relates to the particular heavy rainfall and flood event in 2013. It also exposes learners to an appreciation of not only the physical impacts of extreme weather events but also to environmentally related and gender sensitive issues. It also introduces the concept of time scale for reconstruction, rehabilitation and recuperation. In many ways, it can allow communities to conceptually link the priorities of gender sensitivity into climate change adaptation especially with respect to extreme flooding and rainfall events.

Substantive academic coverage

Gender sensitivity and climate change adaptation

Differentiated power relations between men and women and unequal access and control over assets mean that men and women do not have the same adaptive capacity. Instead, women have distinct vulnerability, exposure to risk, coping capacity and ability to recover from climate change impacts. Gender relations determine adaptation strategies. For example, as a result of gender-differentiated roles in agro biodiversity management, women often have greater knowledge of plant varieties with important nutritional and medicinal values. However, because men have more secure access to land or land tenure, they have more incentive to contribute to effective natural resources management and other factors necessary for adaptation.

Activity 1:

The overarching objective of this exercise is to use the case study presented as a context for understanding the overlaps, parallels and intersects between steps that policy practitioners can take to include gender sensitivity in climate change adaptation planning and in disaster risk reduction planning.

Taking each list at a time, and examining each point, suggest where in the context of the St. Vincent and the Grenadines scenario, these steps could have been better executed. Are the interventions suggested at the same points or within the same processes when considering climate change adaptation and disaster risk reduction? If so, in those instances, both planning processes can be integrated.

List A: Steps for gender mainstreaming in climate change adaptation initiatives

- Analyse the effects of climate change from both male and female perspectives.
- Ensure disaggregation of qualitative and quantitative data by sex, in all assessments and stocktaking.
- Incorporate a female perspective when designing and implementing projects.
- Capitalise on the talents and contributions of both women and men.
- Set targets for female participation in activities.
- Ensure that women are adequately represented in all decision-making processes and at all levels.
- Ensure that gender specialists are involved and consulted throughout the project implementation process.
- Prioritise women's equal access to information, economic resources and education.
- Address gender differences in capabilities to cope with climate change adaptation and mitigation.
- Develop and apply gender-sensitive criteria and indicators for progress monitoring and evaluation of results.

- Undertake a gender analysis of all budget lines and financial instruments to determine the differentiated impact of the budget on women and men.
- If relevant, consider reallocation of resources to achieve gender equality outcomes by planned action.
- Develop and apply gender-sensitive criteria and indicators.

List B: Steps for gender mainstreaming in disaster risk reduction

- Include gender perspectives into disaster reduction efforts at the national, regional and international levels, including in policies, strategies, action plans and programmes.
- Analyse climate change data (such as desertification, floods, drought, deforestation) through a gender-sensitive perspective.
- Take gender-conscious steps to reduce the negative impacts of natural disasters on women, particularly in relation to their critical roles in rural areas in the provision of water, food and energy.
- Increase the participation and representation of women in all levels of the decision-making process.
- Include the traditional knowledge and perspectives of women in the analysis and evaluation of the characteristics of key disaster risks.
- Ensure that women are visibly used as agents of change at all levels of disaster preparedness, including early warning systems, education, communication, information and networking opportunities.
- Build the capacity of national and local women's groups and provide them with a platform to be heard and to engage optimally.
- Consider the level of a woman's access to technology and finances in times of disaster.
- Include gender-specific indicators to monitor and track progress on gender equality targets.

Activity 2:

Below is part of a sample Terms of Reference (TOR) for planning a PDNA mission. How would you re-write or add detail to this TOR to ensure that there is comprehensive coverage of gender sensitive assessment and environmental sustainability impacts? Please be specific, keeping in mind that a key objective is to gather information not only for recovery, but for better disaster risk reduction planning in the future.

Sample ToRs:

PDNA Planning Mission

Background: A short description of the disaster and of the key facts leading up to the Planning Mission.

Composition: All constituents of the tripartite partners and the Government should form part of the PDNA Planning Mission. Other stakeholders who should be part of the Planning Mission include relevant ministries, regional governments, in-country representatives of UN agencies, local and international NGOs and potential donors. Simply put, the composition of the team should be decided keeping in mind the expected outputs of the Planning Mission, which are outlined below.

Responsibilities: The Planning Mission supports consultation among the Government (of the affected country), the UN Country Team, the WB, the EU as well as other stakeholders. The purpose of the Planning Mission is to make the necessary arrangements for the conduct of the PDNA. In particular, it is responsible for the following core outputs and activities:

1/Situation Analysis

Write a situation analysis report providing an update of the disaster situation, based on the following:

• Desk review of all existing rapid assessment reports, field reports, available government data, maps, satellite mages, among others • Consultations with all key stakeholders • Reconnaissance mission, if required
• Collection of core baseline data likely to be needed by all sectors

2/ The PDNA Plan

The scope of the PDNA: • Objectives of the PDNA. • Sectors and cross-cutting themes to be assessed by the PDNA and the criteria of identification. • Geographic areas to be assessed. • PDNA timeframe.

PDNA management arrangements • Management structure and composition: the PDNA Coordination Team and High-Level Management Team • Composition of technical teams: sector teams, personnel for technical support and report writing • Creating an organogram, with reporting lines • Schedule of meetings, workshops and other communication arrangements.

PDNA staffing arrangements •Total staffing requirements to staff all teams • In-country staff available from government as well as international community • Surge capacity needed • Areas of expertise needed • HQ staffing arrangements, if needed • ToR for key teams and staff members, including for the entire PDNA Team Review CVs, interview potential assessment staff, both in-country and external candidates

Reporting: The Planning Mission reports to the High-Level Management Team.

Risk, Vulnerability and Resilience

Adaptation is a process by which individuals, communities and countries seek to cope with the impacts of climate change and variability. It is about taking the right measures to reduce the negative impacts of climate change. There are many ways of adapting to climate change, ranging from technological options to behavioral change at the individual level. The degree to which a system needs to adapt is a function of its vulnerability to climate change, which in turn is determined by the level of its exposure and sensitivity to impacts. The exposure can be to hazards such as drought or conflict and also to underlying socio-economic, institutional and environmental conditions.

Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea-level rise)

(IPCC 2007).

Vulnerability is the degree to which a system is susceptible to and unable to cope with adverse effects of climate change including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate change and variation to which a system is exposed, its sensitivity and its adaptive capacity

(IPCC 2007).

Adaptive capacity (in relation to climate change impacts) is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences

(IPCC 2007).

Activity 3:

Incorporating a gender sensitive climate change adaptation matrix in needs assessments.

a. Identify the livelihood related roles played based on gender in the affected community.
b. For the main gender related livelihoods, identify the impacted community capital and resources (e.g. water, land, roads, transport, tools, electricity etc.) that prevent persons from continuing their livelihoods post disaster. List the importance of each of these resources to persons' livelihoods on a high, medium, low or five-point scale.
c. List the impact of the disaster on these resources to each gender, rating them as high, medium and low or using a five-point scale.
d. If you have quantified, calculate the product of resource importance, times degree of impact for each block and the sum total for each gender.

This is a first-cut of a gender based rapid vulnerability assessment. What does it reveal about who is vulnerable? What are the gaps in knowledge? By identifying gender based vulnerability levels in livelihoods, how can this assist with improving disaster risk reduction planning?

Further use of the matrix might involve exploring ratings according to outcomes or comparing different scenarios of future vulnerability and aggregating the matrix ratings into overall scores.

The rating of sensitivities depends on the outcome of exposure and hazard. For instance, sensitivity to mortality usually has a different rating for each hazard than exposure to loss of livelihood (e.g., economic impacts), or well-being (as a broader category including social and psychological stresses). In most cases, the initial ratings are related to a broad interpretation of economic assets. However, if the matrix is to be used analytically, it is necessary to specify the consequences or outcomes of the identified vulnerabilities. Most commonly, these include loss of life and loss of property (assets), but some stakeholders may be concerned with the full range of livelihood capitals - including social networks and psychological stress.

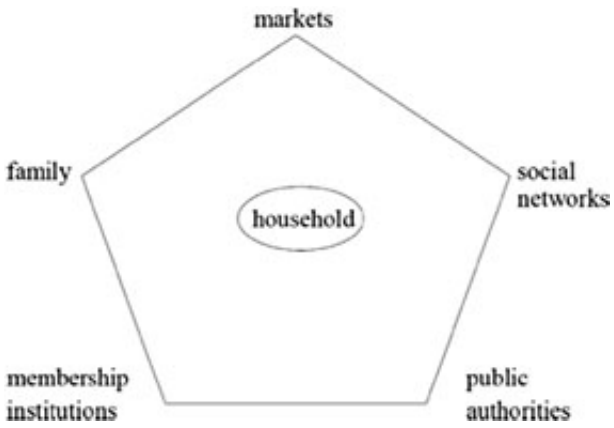
Disaster Needs Assessment

A Post-Disaster Needs Assessment and Recovery Framework (PDNA/RF) together comprise an approach to harmonising the assessment, analysis and prioritisation of damages, losses and needs by a range of stakeholders. It is a means of supporting the national government and is most often a government-led exercise. A PDNA pulls together information into a single, consolidated report, information on the physical impacts of a disaster, the economic value of the damages and losses, the human impacts as experienced by the affected population, and the resulting early and long-term recovery needs and priorities.

Questions:

1. To what extent was this done in the case of St. Vincent and the Grenadines? In your opinion, was there sufficient coverage of social, economic and environmental impacts?
2. The PDNA reports list many action items for recovery in the short, medium and long term. Based on the case study, are there lessons learned that can be incorporated into ongoing disaster risk reduction and planning that will minimise or mitigate impacts related to any of the action items listed?

Post Disaster Needs Assessment must feed back into the disaster risk reduction planning process in order to improve social welfare. There are five major forms of social welfare that may be employed during periods of crisis. Central to the model is the notion that family, markets, social networks, membership institutions and public authorities provide important, yet variable forms of welfare from which poor and vulnerable populations may draw during times of disaster stress.



Question:

3. Based on the experience in St. Vincent and the Grenadines, what are the most important outcomes that need to be fed into the disaster risk reduction planning process? What would be the social welfare outcomes of integrating such feedback? Can your recommendations be implemented?

THE EKACDM INITIATIVE

The Enhancing Knowledge and Application of Comprehensive Disaster Management, EKACDM) Initiative is a five year project which was implemented in the Caribbean region from September 2013 to December 2018 by the Disaster Risk Reduction Centre, the Institute for Sustainable Development, the University of the West Indies.This Initiative seeks to establish an effective mechanism and programme to promote an integrated approach to Comprehensive Disaster Management knowledge in the Caribbean region, to fast track the implementation of the CARICOM Enhanced Comprehensive Disaster Management (CDM) Strategy and Frameworks (2007 - 2012 and 2014 - 2024).

The ultimate outcome of the EKACDM Initiative is to reduce the impact of natural and technological hazards and the effects of climate change on men, women and children in the Caribbean region. It seeks to position the region with greater knowledge and practical solutions to strengthen climate adaptation, and other sustainable practices that will make the region more resilient and sustainable.

For further information:

http://www.uwi.edu/EKACDM/index.aspx
http://uwi.edu/drrc/
http://www.uwi.edu/isd/