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RECOMMENDATIONS FOR DISASTER RISK REDUCTION IN THE CARIBBEAN:

A Guide for Policy Makers, DRR Practitioners
and Communities and adapted from EKACDM
Case Studies in Barbados, St. Kitts and Nevis
and St. Vincent and the Grenadines

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**Enhancing Knowledge
and Application
of Comprehensive
Disaster Management**
(EKACDM) Initiative

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SUMMARY

1 SUMMARY

This report was commissioned as an output of the Enhancing Knowledge and Application of Comprehensive Disaster Management (EKACDM) project in order to provide key stakeholders with a simple guide to implement specific disaster risk reduction measures within Caribbean jurisdictions. Key stakeholders comprise policy makers, Disaster Risk Reduction (DRR) practitioners (and those whose fields also address DRR), and communities.

The report outlines the landscape of Disaster Risk Reduction within the Caribbean as a foundation which documentation of this nature requires and provides the reader with a general perspective of the work that has been done and is currently being done globally and regionally. Special emphasis will be placed on the Caribbean region.

Lessons learned and recommendations have been extracted from three Case Studies emerging from the EKACDM project, which highlighted the work in three countries in the Caribbean. The countries and Case Studies were:

- > **Barbados**- Examining the role and history of the District Emergency Organisations (DEO) in DRR
- > **St. Kitts and Nevis**- Impact of Pan American Health Organisation's (PAHO) Smart Health Care Facilities project
- > **St. Vincent and the Grenadines**- Application of Post Disaster Needs Assessment in St. Vincent and the Grenadines

Recommendations coming from these Case Studies have been mapped against the Comprehensive Disaster Management (CDM) Strategy 2014-2024 and presented based on their level of alignment.

BACKGROUND



2 BACKGROUND

The Caribbean region is vulnerable to a number of hazards. As a result of the geographical location and geomorphological composition of many of the territories that comprise the archipelago, the region experiences hurricanes, earthquakes and significant volcanic activity. Increasing industrialization has also resulted in more frequent and a higher probability of the occurrence of accidents (CDEMA 2014).

In recent decades the region has suffered repeated losses from hurricanes and associated wind, rain and storm surge damage (CDEMA 2018). Typical annual disaster losses have been estimated at US \$3 billion, representing significant loss to social and productive sectors. The 2017 hurricane season has undoubtedly served as a teachable moment for the Caribbean, with more than US \$100 billion in damage over 12 Caribbean islands across the region (Collymore 2018).

Familiarity with hazard occurrences has resulted in the region attaining what can be considered in many respects an unrivaled level of maturity in managing associated disaster risk, from both institutional and non-institutional perspectives. The Caribbean Disaster Emergency Management Agency (CDEMA), formerly the Caribbean Disaster Response Agency (CDERA) is the regional inter-governmental agency put in place in 1991 to coordinate Disaster Management activities within its Participating States. Moving from a focus on response activities to embracing the tenets of Comprehensive Disaster Management, CDEMA has rolled out three iterations of the Comprehensive Disaster Management Strategy, the most recent of these spanning the time period 2014-2024 (CDEMA 2018).

The Strategy seeks to outline four areas (Priority Areas) which are deemed to be critical in reducing disaster risk within the Caribbean Region in order to achieve resilience and the reduction in disaster losses. The four Priority Areas are:

1. Strengthened institutional arrangements for CDM
2. Increased and sustained knowledge management for CDM
3. Improved integration of CDM at sectoral levels
4. Strengthened and sustained community resilience

These areas, along with the associated Regional Outcomes, not only encapsulate the needs of the Caribbean but embrace the tenets of international agreements governing Disaster Risk Reduction and Sustainable Development. The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is the current international agreement for DRR, endorsed by the UN General Assembly following the Third UN World Conference on Disaster Risk Reduction in 2015 (UNISDR 2018). The Sendai Framework also possesses four priority areas or 'Priorities for Action' and seven targets for implementation. The four Priorities for Action are:

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

The United Nations have also embarked on a journey toward the achievement of Sustainable Development through the establishment of seventeen goals, referred to as the Sustainable Development Goals (SDGs) or the 2030 Agenda. These goals span the areas of poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, urbanization, environment and social justice. The thinking is that the reduction of disaster losses at the local, national and regional levels will ultimately lead to the achievement of these SDGs globally. The CDM Strategy, which is the regional framework for DRR in the Caribbean and the Sendai Framework, which is the global agreement for DRR are both critical in the overall achievement of Sustainable Development.

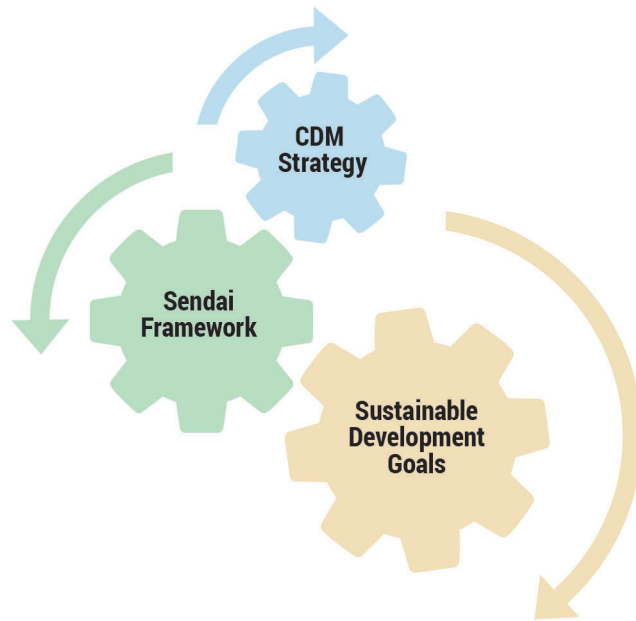


FIGURE 1: THE CORRELATED NATURE OF THE CDM STRATEGY 2014-2024, THE SENDAI FRAMEWORK 2015-2030 AND THE 2030 AGENDA OR SDGS

Climate Change is a critical challenge in achieving the overall goals of these agreements. In the CDM Strategy it is one of four cross cutting themes and it is mentioned throughout the text of the Sendai Framework, specifically as it relates to implementation and is the core of the 13th SDG, to take “Climate Action”. According to the IPCC (2015), sea level rise has increased to between 2.8-3.6 mm per year since 1993, a much higher average than that of much of the 20th century and certainly larger than preceding centuries. This development and the increased rainfall and temperatures are of significant concern for the Caribbean given the intensification of floods and droughts, and the resultant negative impacts on critical sectors such as agriculture. The expected increase in strength and probable frequency of hurricanes is also reason for immense concern for the Caribbean as the cost, firstly of mitigating the impacts, as well as responding once they occur is extremely burdensome to the region’s

fragile economies. For these reasons, it is vital for the region to undertake efforts to address the mitigation of disaster risks and therefore this initiative which distils recommendations from the three EKACDM Case Studies is an important tool for Policy Makers, DRR Practitioners and communities for implementing effective measures to address disaster risks and reduce vulnerability in the region.

METHODOLOGY



3 METHODOLOGY

The process employed by the author for the compilation of this report encompassed predominantly qualitative methods, however there were elements which may be considered as quasi-quantitative. There were four (4) overall non-sequential phases for completion of the report, within which further steps were employed. These steps may be seen in the work flow diagram in Appendix 2. The major phases are as follows:

1. Review of EKACDM Case Studies

The three (3) EKACDM Case Studies underwent extensive review:

- a. **Barbados:** Examining the role and history of the District Emergency Organisations (DEO) in DRR
- b. **St. Kitts and Nevis:** Impact of Pan American Health Organisation's (PAHO) Smart Health Care Facilities project
- c. **St. Vincent and the Grenadines:** Application of Post Disaster Needs Assessment in St. Vincent and the Grenadines

2. Distillation of lessons learned and recommendations

Within the case studies, there were lessons learned and recommendations which were expressly articulated. Other lessons learned were not explicitly mentioned, but could be inferred from described constraints or from themes within the case study that indicated ineffective practice. From this process, the complete list of lessons learned and recommendations was derived. To further utilize the metaphor, each priority recommendation was further 'distilled' based on whether it was linked to the four Priority Areas of the CDM Strategy 2014-2024. The final recommendation list to be investigated was then obtained from those recommendations which aligned the closest with the CDM Strategy, to the level of Regional Outcome and indicators. Further desktop research was then conducted to include directions and tools for implementation, as well as a more thorough cost-benefit analysis, though also significantly limited in scope due to the nature of the report and time restrictions. The final recommendations were summarized and placed in the lessons learned summary table.

3. A- Desktop research surrounding recommendations

The recommendations which were a part of the final list underwent further investigation in which supporting literature, such as handbooks, manuals and reports, were referenced in the lessons learned summary table (Appendix 1) and in some cases in the body of the report. The desktop research also included the cost-benefit analysis.

B- Desktop research surrounding recommendations- Cost-benefit analysis

A qualitative cost benefit analysis was carried out for the report. The analysis draws on the body of literature including historical cases from the region and beyond in seeking to determine the range of costs and benefits associated with the recommendations distilled from the EKACDM Country Case Studies.

Conceptually, both quantitative and qualitative cost benefit analyses involve three steps:

1. Describing costs and benefits – identifying and describing costs and benefits;
2. Attributing costs and benefits – analysing the contribution of the intervention to achieving the observed outcomes;
3. Comparing costs and benefits – analysing the relationships between costs and benefits.

The narrative within this report seeks to succinctly cover these three areas, as observed in the literature. However, there are several expected limitations associated with a significantly scaled-down cost-benefit analysis of this nature. Where conditions of time and data constraints do not exist, each recommendation would be best treated with a comprehensive description of the activities undertaken, a detailed listing of recommended stakeholders and detailed estimates of resources required.

Specifically across the three steps outlined, the costs and benefits were further delineated to draw on the following segments, as illustrated in the table below.

BENEFITS	COSTS
Positive outcomes	Resources expended
Negative outcomes avoided	Negative outcomes

4. Completion of lessons learned summary table

The lessons learned summary table was compiled during the process of the research for resources on these. The summary table consisted of 11 columns which highlighted different aspects of the recommendations including past and present initiatives which incorporated some of these good practices.

RECOMMENDATIONS



4 RECOMMENDATIONS

This section provides the final stage of analysis of the recommendations distilled from the EKACDM Case Studies.

There were three categories of recommendations:

1. Those which fall under the 16 Regional Outcomes within the 4 Priority Areas of the CDM Strategy and will be accompanied by a summary narrative.
2. Those which fall under the 4 Priority Areas of the CDM Strategy and will be listed in the summary table in Appendix 1.
3. Those which do not fall under the four Priority Areas and 16 Regional Outcomes but may include aspects of the cross cutting theme, gender, and will simply be listed.

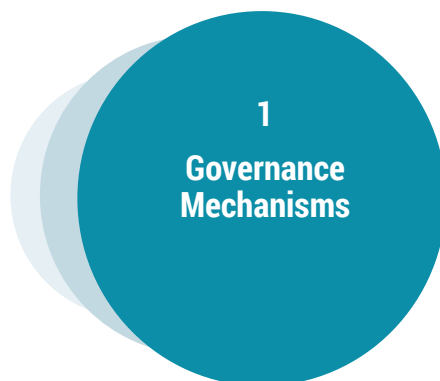
PRIORITY AREA ONE

Increased institutional arrangements for CDM

Recommendations distilled from the case studies highlighted three major areas which encompassed the tenets of the Regional Outcomes (RO) of Priority Area One. The case studies suggested the need for:

1. Strengthened governance mechanisms for Disaster Risk Reduction at the national level
2. Enacted DRR/CDM legislation
3. DRR/CDM Policies and Strategies.

1. Strengthened governance mechanisms for Disaster Risk Reduction at the national level



Regional Outcome 1.1 of the CDM Strategy 2014-2024 articulates the need for National Disaster Organisations and the CDEMA Coordination Unit to be strengthened for effective support for the implementation, monitoring and evaluation of CDM in Participating States.

This recommendation was made a priority as it was suggested within all three EKACDM Case Studies in varying forms. The need for consistent, systematic coordination of activities through interaction among relevant stakeholders was seen to be critical.

Within the Performance Monitoring Framework (2015) of the CDM Strategy 2014-2024, this was referred to as a Governance Mechanism. The second indicator within Regional Outcome 1.1 requires that Participating States and the CDEMA CU have a functioning Governance Mechanism.

The idea surrounding the presence of a national level governance mechanism stems from the regional form within the CDEMA CU. According to CDEMA (2018), the CDM Governance Mechanism is a framework which seeks to promote a harmonized approach for the development of CDM programming in CDEMA Participating States. The regional CDM governance mechanism is comprised of the Coordination and Harmonization Council, which has seven sector subcommittees, as well as a gender working group, a CDM MER Framework Sub-Committee and a CDM Database Sub-Committee.

Within the literature, there is general consensus on the need for wide and varied partnerships to support the planning and implementation of risk reduction projects. Having effective governance helps to make risk reduction initiatives more sustainable and replicable, and allows for more effective use of finances (Twigg 2015). The National Disaster Offices should be the lead for coordination of the functioning of the National CDM mechanism and all priority sectors should be included within discussion on CDM activities. A set frequency for meetings should be agreed upon to facilitate consistent flow of information and bridge the gap created by conducting 'in-silo' activities. Certainly, this measure has the potential to reap several rewards however it has been noted that the sustainability of such a mechanism has posed a challenge for countries because of competing priorities and time constraints of stakeholders.

Discussion on Costs and Benefits

Benefits of strengthening governance mechanisms for DRR at the National Level

Positive Outcomes and Negative Outcomes Avoided

There are several positive outcomes which may accrue from the development and strengthening of national governance mechanisms for Disaster Risk Reduction. These include general cross sectoral as well as sector specific benefits. Governance mechanisms may be considered the vehicle through which CDM planning can take place for the mobilization of efforts towards institutionalizing DRR/CDM at the national level through legislation, policy and strategy. The mobilization of financial resources from national, regional and international sources can also be facilitated through adequately functioning governance mechanisms. Specifically, governance mechanisms facilitate the organisation of other financial processes such as the compensation of DRR committee members and teams. Direct coordination with International and Regional partners can also be expedited through these governance mechanisms. The promotion of adequate building codes across sectors is another critical area which would benefit from a well functioning committee. It could also promote advances in knowledge building by pursuing research which is commonly agreed upon as beneficial by relevant stakeholders.

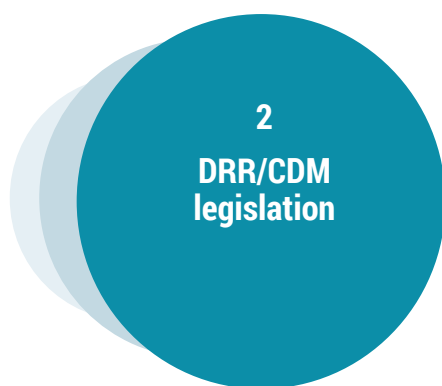
In developing robust disaster committees throughout the region, there are a number of negative outcomes which may be avoided. These include 'in-silo' planning and organisation of projects and programmes which result in duplication and the consequent waste of resources, a critical area of concern in the developing Caribbean region. Overall, a well-functioning Disaster Committee or Governance Mechanism can be one of the major elements of reducing disaster losses at the national and regional levels, which is the overall objective of CDM.

Costs associated with strengthening governance mechanisms for DRR at the National Level

Resources Expended and Negative Outcomes

Arguably the main resource to be expended in strengthening the functionality of national governance mechanisms is time. Stakeholders from multiple government and non-governmental departments and organizations will understandably have competing interests to attend to and as such, the factor of time may be of paramount consideration. Financial resources to be expended would vary from territory to territory, with frequency of meetings and other basic considerations such as venue, number of persons and catering also playing a part. There are no documented negative outcomes which may result from strengthening governance mechanisms for DRR at the national level.

2. Enacted DRR/CDM legislation



The second recommendation arising within Priority Area One is the enactment of legislation governing CDM activities. This aligns with Regional Outcome 1.2 which says that CDM should be integrated into policies, strategies and legislation of CDEMA Participating States.

Throughout the EKACDM Case Studies, attention was drawn to the need for legislation governing various aspects of DRR.

Within the CDEMA architecture, there have also been provisions made for the establishment of effective CDM Legislation which covers the tenets of CDM. The Model CDM Legislation 2013 was designed for countries to develop new or to adjust existing legislation to employ measures consistent with the CDM Strategy and the Caribbean's direction for resilience building.

Further, in the international landscape, there are several resources available which give guidance on appropriate DRR legislation to supplement regional materials. Arguably the most notable in recent years came about as a result of collaboration between the United Nations Development Programme and the International Federation of Red Cross. A handbook and checklist on Law and Disaster Risk Reduction was produced in 2015, emphasizing the importance of having effective DRR legislation in building community resilience and reducing existing risks posed by natural hazards. These tools also take practitioners and policy makers through a step by step process which allows stakeholders to easily identify the elements of effective DRR legislation present within their jurisdiction (Figure 2).

1	Does your country have a dedicated law for disaster risk management that prioritizes risk reduction and is tailored to your country's context?
2	Do your country's laws establish clear roles and responsibilities related to risk reduction for all relevant institutions from the national to the local level?
3	Do your country's laws ensure that adequate resources are budgeted for disaster risk reduction?
4	Do your country's relevant sectoral laws include provisions to reduce existing risks and prevent the creation of new risks?
5	Do your country's laws establish clear procedures and responsibilities for conducting risk assessments and ensuring risk information is considered in development process?

In order for effective development and operationalisation of DRR Legislation, there is need for partnerships among several stakeholders including policy makers as well as law practitioners and those within sectors critical to DRR such as agriculture, tourism, education, finance and physical planning. While there are resources available regionally and internationally, the development and revision of legislation in the Caribbean has historically been a lengthy process.

FIGURE 2: A SNAPSHOT OF THE CHECKLIST ON LAW AND DRR

Discussion on Costs and Benefits

Benefits of enacting CDM/DRR legislation

Positive Outcomes and Negative Outcomes Avoided

Disaster Risk Reduction is one of the most critical challenges facing the region and it impacts every facet of society for generations to come. As such DRR requires strong legal foundations on which to stand, in order to effectively advance its objectives and realize its goals. Common enacted and enforced legislation can be the catalyst for generating a culture of resilience building in the region. Further, the tenets of the regional and international frameworks can be mainstreamed into legislation, solidifying their positions in the regional legislative landscape and serving as incentives for donors.

Costs associated with enacting CDM/DRR legislation

Resources Expended and Negative Outcomes

Costs associated with the development and enactment of CDM legislation, as well as the time taken to go through the entire process, would be considered resources expended. Updating legislation has traditionally required a significant amount of time and as such, it may be years before completion.

3. DRR/CDM Policies and Strategies



The third and final Priority Area One recommendation emerging from the EKACDM Case Studies was aligned with Regional Outcome 1.2 ('CDM is integrated into policies strategies and legislation by Participating States'). In similar fashion to the second recommendation, the case studies highlighted the need for robust DRR policies within the targeted countries, which was thought to be an area preventing effectiveness in the themes covered by the case studies.

There has been unanimity across the literature regarding the need for policies which directly address Disaster Risk Reduction along with development policies in which DRR is mainstreamed. It is said that the success of policy initiatives aimed at overall development is dependent on the reduction of vulnerability and disaster risk (Twigg 2015). This linkage has led to the promotion of DRR policy at the national level by several entities (regionally and internationally) and the development of resources which give policy guidance and promote the value of DRR policy in national development. These include but certainly are not limited to:

- > Model Comprehensive Disaster Management Legislation and Regulations 2013
- > Model Comprehensive Disaster Management Policy and Adaptation Guide
- > Effective law and regulation for disaster risk reduction: a multi country report
- > Words into Action Guidelines- Implementation guide for local disaster risk reduction and resilience strategies: A companion for implementing the Sendai Framework target E
- > Characteristics of a Disaster-Resilient Community: A Guidance Note

The promotion of DRR policy is not a new concept for the Caribbean. Within the CDEMA system, there has been a push towards the development of CDM Policies throughout CDEMA Participating States which strengthened States in fulfilling the requirements of the CDM Strategy. One avenue through which this was conducted was the now ended Comprehensive Disaster Management Harmonisation and Implementation Project. This project resulted in nine (9) CDEMA Participating States having CDM Policies and/or Strategies (CDEMA 2013). The countries are:

- | | |
|------------------------|-----------------------------------|
| 1. Antigua and Barbuda | 6. Grenada |
| 2. Anguilla | 7. Jamaica |
| 3. Virgin Islands | 8. St. Vincent and the Grenadines |
| 4. Guyana | 9. Turks and Caicos Islands |
| 5. Trinidad and Tobago | |

¹ http://cdema.org/index.php?option=com_joomdoc&view=docman&gid=83&task=cat_view&Itemid=231&limitstart=10

While these countries possess policies, further research is needed in order to investigate the extent to which these are effective. This resides outside of the scope of this report.

While the benefits of policies and strategies are clear, there is a school of thought which states that emphasis should be placed on DRR practice rather than policy as it has been noted that in many cases globally, DRR policy has seen little impact (Benson and Twigg 2007).

Similar to the development of CDM/DRR legislation, significant participation of several multi sector stakeholders is required for adequate development. The CDM Strategy 2014-2024 identified seven priority sectors which, along with any additional sectors deemed critical by specific countries may be engaged. These sectors also form part of the CDM Coordination and Harmonisation Council. The CDM Strategy's priority sectors are Agriculture; Civil Society; Education; Finance; Health; Physical and Environmental Planning and Tourism.

Discussion on Costs and Benefits

Benefits of developing and strengthening DRR Policy and Strategy

Positive Outcomes and Negative Outcomes Avoided

The development of DRR Strategies and Policies throughout the region serves to set out a deliberate pathway for which the region is to achieve its goals. They also provide the opportunity to incorporate the tenets of regional and international Frameworks which the region would have signed on to, making a statement to donors and other partners that the critical areas of development have been prioritized by decision makers. The successful implementation of sector-specific DRR plans in vulnerable economic sectors such as agriculture can lead to economic growth in those sectors over time and a reduction in losses that would have otherwise been incurred as a result of hazards or disasters impacting the region. Specifically as it relates to the CDM Policy and Strategy, there are several benefits which would accrue, as the Model CDM Policy and Strategy covers a variety of areas such as education and awareness, the strengthening of the institutional capacities and the consideration of vulnerable groups in the region.

Costs associated with developing and strengthening DRR Policy and Strategy

Resources Expended and Negative Outcomes

In implementing CDM policies and strategies, significant financial and human resources are required. Specific examples would include trained personnel to conduct training individuals to manage and monitor projects and the required infrastructure.

PRIORITY AREA TWO

Increased and Sustained Knowledge Management and Learning for CDM

Priority Area Two also saw three recommendations emerging from the EKACDM Case Studies which aligned with the Regional Outcomes of the CDM Strategy 2014-2024. These were:

1. The promotion of hazard and vulnerability assessments
2. Increased training of public sector staff in DRR
3. Improved interagency data sharing

1. Promotion of hazard and vulnerability assessments



Regional Outcome 2.3 aims at ensuring that there is improvement in the incorporation of community and sector-based knowledge into risk assessment. Within this RO, the specific indicator requires that communities have hazard and vulnerability assessments completed in consultation with community and sector partners.

The assessment of vulnerability requires the ability to both identify and understand the susceptibility of elements at risk and of the society as a whole to hazards (Fuchs, Birkmann and Glade 2012).

This recommendation was made particularly by the St. Vincent Case which covered the Post Disaster Needs Assessment (PDNA) process after the December 2013 rains. In addition, the case study also called for landslide susceptibility maps, to include other interacting risks such as floods, rockslides and mudslides with particular attention given to areas which are left unstable after the flood event. The importance of utilizing these in development planning was also highlighted.

The International Federation of Red Cross has been one of the leading Development Partners conducting initiatives in which the vulnerability and capacity of communities are assessed. Vulnerability Assessments have also been conducted as part of community projects region wide. Current projects such as the PAHO Smart Healthcare Facilities initiative, funded by the Department For International Development heavily consulted with communities for assessing the impact of hazards on the Healthcare Facilities being assessed for retrofitting.

Despite these documented Hazard and Vulnerability Assessments, the CDM audit reported that risk assessment is generally weak as regional standards (and tool/ methodology) for structural vulnerability is available but not adequately applied at the national level.

Discussion on Costs and Benefits

Benefits of conducting hazard and vulnerability assessments

Positive Outcomes and Negative Outcomes Avoided

Hazard and vulnerability assessments provide a range of benefits. They help practitioners and decision makers understand social, economic and environmental problems and their underlying causes. They also aid in prioritising and sequencing actions and inputs. Hazard and vulnerability assessments also help evaluate specific risks and empower and mobilise vulnerable communities. These processes can significantly aid in providing reliable and readily available data for future research and decision making processes. By identifying their vulnerabilities and capacities, local communities can aid in the recognition and implementation of strategies for immediate and longer-term risk reduction, as well as identify what they can do themselves to reduce risk and where they need additional resources and external assistance. Assessments can then provide insight into specific vulnerability reduction measures for implementation such as building codes; insurance and social protection (risk); economic diversity and resilient livelihoods; knowledge and awareness raising and preparedness measures.

In foregoing the processes of conducting hazard and vulnerability assessments, a range of negative outcomes may result, including the inefficient allocation of resources among communities. Without a thorough understanding of the existing vulnerabilities, it is difficult and sometimes even impossible to decide on effective strategies and programmes to address vulnerability. Ultimately, the result of a lack of strategic decision making at the community level guided by appropriate hazard and vulnerability assessments will be an increase in disaster losses.

Costs associated with conducting hazard and vulnerability assessment

Resources Expended and Negative Outcomes

There are several human and financial resources needed to carry out effective hazard and vulnerability assessments. These costs are often absorbed by donors and other development partners such as the International Federation of Red Cross who conduct such assessments in countries they serve. Further, there is also need for the acquisition of personnel to carry out these assessments, which may also require financial resources. Poljanšek et al (2017) called for the establishment of well-funded, long term agreements as a means of mitigating against the discontinuity brought on by short-term projects, and time “lost” in starting and ending series of projects.

2. Increased Training of government staff



The CDM Strategy acknowledges the importance of training of technical professionals in Regional Outcomes 2.1 and 2.4. Outcome 2.1 requires that the Regional Disaster Risk Management Network for informed decision-making at all levels be improved. Regional Outcome 2.4 states that educational and training materials for CDM should be standardized, improved and applied in the region.

Within the EKACDM Case Studies, there was direct acknowledgement of this need. In the case of PDNAs in St. Vincent, it was said that there is a need for the identification of capacity gaps and further provision of tailored training for staff in key ministries in risk management and response. Barbados' case highlighted the need for training in field operations utilizing a standardized methodology.

Throughout the region, there has been consistent support from development partners in the area of multisectoral DRR training for both the public and private sectors alike. Partners such as the Pan American Health Organization (PAHO) have provided a number of courses in areas such as Mass Casualty Management, Emergency Care and Treatment, Incident Command Systems and Health Emergency Operations Centres. In the agriculture sector, the Food and Agriculture Organization of the United Nations (FAO) and Inter-American Institute for Cooperation on Agriculture (IICA) conduct frequent courses in areas such as climate-smart agriculture practices. The International Federation of Red Cross also conducts several courses within the region and possesses an online learning Platform.

The EKACDM initiative is also playing a significant role in promoting the use of standardized training materials for DRR which all stakeholders, including public sector practitioners, can utilize. In accordance with this, the second intermediate outcome of the initiative is "The increased use of standardized gender-sensitive educational and training materials for CDM by professionals and students in the Caribbean".

CDEMA has also embarked on efforts to increase and improve DRR training for various stakeholders. The Regional Training Centre, while not fully operational, has provided training for hundreds of individuals, in both the private and public sectors. Further, CDEMA implemented projects such as the Comprehensive Disaster Management Harmonized Implementation Programme (CDM-HIP) as well as the Natural Disaster Risk Management Programme (NDRM) which also provided training for National Disaster Offices (NDO) in CDEMA Participating States.

While it can be said that much training has been conducted, there are still gaps which exist as indicated by the Case Studies. These may be due to reasons such as the lack of institutional memory and contingency planning. As such, there is need for continued collaboration and support of development partners in various sectors to promote the training of individuals in the public sector.

Discussion on Costs and Benefits

Benefits of identifying capacity gaps and providing tailored training in DRR for staff in key ministries

Positive Outcomes and Negative Outcomes Avoided

In pursuing this recommendation, there would be an increase in capacity of personnel in government Ministries, aiding the mainstreaming of DRR across sectors. Another benefit to be obtained from this investment is increased data sharing across ministries, departments and agencies, promoting more congruent systems. Capacity development is one of the most critical areas in achieving a reduction in disaster risks and ultimately a more resilient Caribbean.

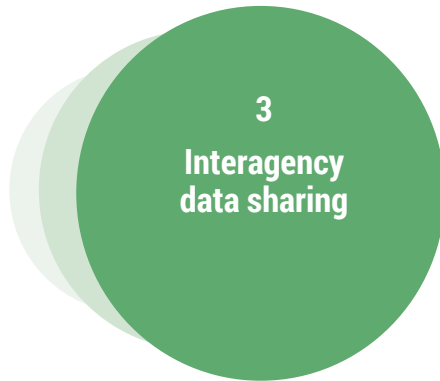
An investment in building the capacity of the public sector would reduce the need to outsource for certain DRR undertakings, which can reduce expenditure and debt.

Costs associated with identify capacity gaps and provide tailored training in DRR for staff in key ministries

Resources Expended and Negative Outcomes

While capacity building in DRR can reap several rewards, it is never a one-time endeavour. Capacity building requires sustained efforts for long-term effectiveness. In this vein, budgetary considerations should always be made for capacity building.

3. Improved interagency data sharing



The CDM Strategy Regional Outcome 2.2 states that integrated systems for fact-based policy and decision making should be established. As the indicator in the Performance Monitoring Framework established, this regional Outcome speaks directly to the use of the Caribbean Risk Information System (CRIS). While CRIS has been envisioned and identified as the avenue through which data should be shared, it has not yet become fully operational and so is not available for use.

Within the EKACDM Case Studies, a lack of communication among agencies has been deemed a major challenge causing disjointed activities and ineffective use of resources and as such requires attention. While the operationalisation of a data sharing platform may be a step towards facilitating increased data sharing among agencies, generating a culture of data sharing and managing intra-agency bureaucracy may require ongoing attention.

The success of a recommendation such as this will require the participation of all individuals and agencies in all sectors.

Global case studies shed light on various approaches to secure integration and sharing of data for disaster management. In the Philippines in particular, three strategic instruments have been utilized to promote data sharing. i.e. Memoranda of Understanding, Data Sharing agreements and Executive Directives (Fabic, 2012).

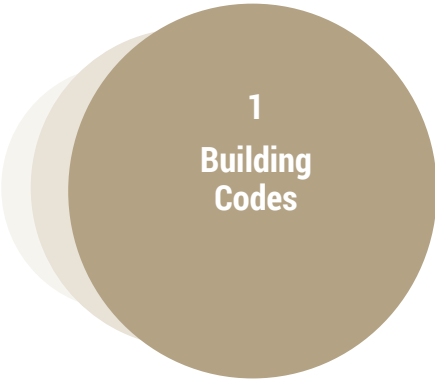
PRIORITY AREA THREE

Improved integration of CDM at sectoral levels

There were several recommendations coming out of the Case Studies which fell under Priority Area Three. The St. Vincent case study offered the strongest basis for the recommendations that emerged. There were four general recommendations in this area, the final three of which had overlaps, and were linked directly to Priority Area One, highlighting the need for strengthened institutional arrangements. These recommendations also had a strong linkage to the cross cutting theme of environmental sustainability. The recommendations highlighted the need to:

- 1. Advance and adopt risk reduction-based building codes and strengthen training and enforcement in these areas
- 2. Incorporate watershed and flood risk management in national land-use planning processes
- 3. Identify and act on the development of required legislation to manage land-use in high risk areas particularly in recurrent floodplain zones
- 4. Develop land use policies which include improved lands, water and river management and the rehabilitation of degraded forests

1. Advance and adopt risk reduction-based building codes and strengthen training and enforcement



The second Regional Outcome in Priority Area Three (RO 3.2) speaks to the importance of incorporating hazard information into development planning and work programming for Priority Sectors. This recommendation highlights an integral consideration for risk reduction in the literature, one of the predominant aspects of addressing underlying risk factors - the need for adequate building codes.

This was recommended in the Barbados Case Study.

At a working session for the third World Conference on Disaster Risk Reduction, emphasis was placed on standards for DRR including building codes.

It was stated that successful implementation of a post-2015 framework will hinge significantly on standards which provide a common terminology and process, promote accountability as well as good governance. Overall five recommendations were made based on existing gaps. These are depicted in Figure 3 below.

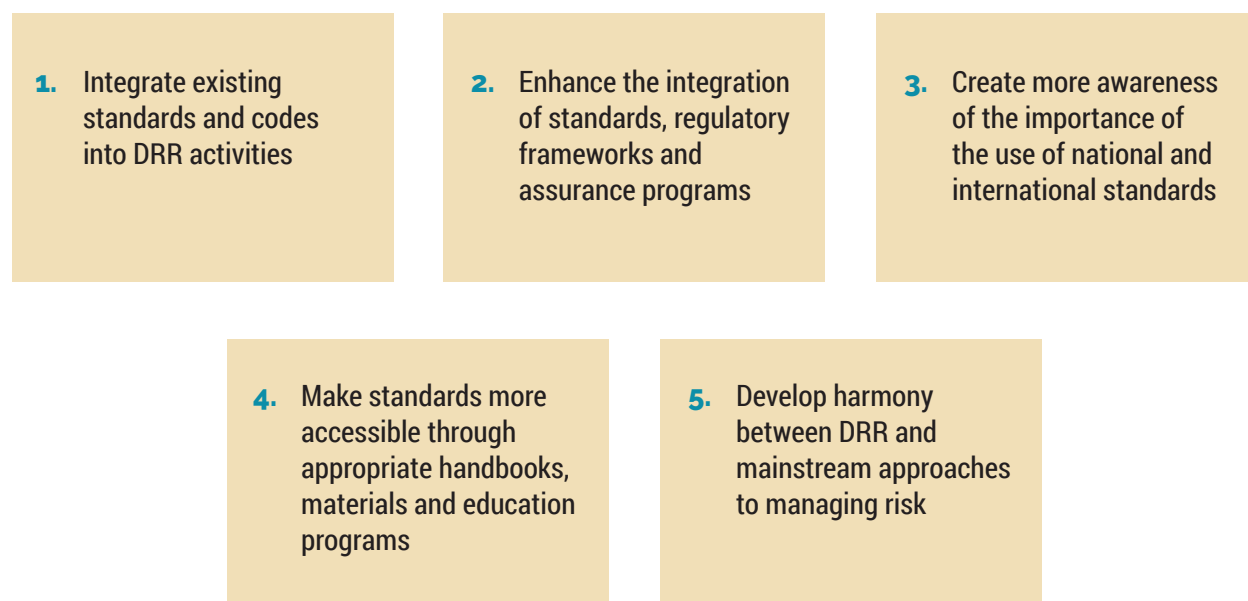


FIGURE 3: SIX MAJOR RECOMMENDATIONS FOR INCORPORATING STANDARDS AND CODES FOR REDUCING DISASTER LOSSES

In integrating standards and codes into disaster risk reduction activities as stated in the first recommendation, areas in which relevant standards are missing or inadequate should first be addressed and partnerships should be established with international standards bodies to facilitate this. This would aid in including other disaster risk reduction perspectives such as business continuity and disaster management as well as safety levels between newly constructed buildings and existing buildings.

As alluded to in the third recommendation, there is need for stronger linkages between DRR practitioners and policy makers and their national and international standards institutions. In terms of training and capacity building the following stakeholders may be targeted:

- > Policy makers
- > Businesses
- > Engineers
- > Regulators
- > Infrastructure builders and managers
- > Insurance providers

World Bank² cements these reflections and further posits that incremental implementation is key in successful reduction of disaster losses. Several examples were provided from developed nations with mature and enforced building codes who experienced significantly less losses than their developing counterparts who experienced the same hazards. This again emphasizes the importance of first addressing underlying risk factors in reducing disaster losses.

² <https://openknowledge.worldbank.org/.../Building0regul0sks0for0safer0cities.pdf>

One useful tool which may aid in guiding the development of adequate building codes for the region is The International Building Code®³. This publication establishes minimum requirements for building systems using prescriptive and performance-related provisions, based on principles which allow for the use of new materials and new building designs. It aligns with other international codes, developed by the International Code Council and is embraced by many jurisdictions globally.

At the regional level, the CDM Audit conducted in 2016 suggests the need for building codes to be legislated and better enforced at the national level, however, limited resources have been identified as a challenge prohibiting adequate enforcement of standards. The audit also states that Regional Building Standards (RBS) are widely applied among countries but national building code requirements are non-binding and therefore there is little incentive for enforcement. Four of the countries participating in the audit however have updated their national building codes in accordance with the Regional Building Standards.

The role of PAHO's Smart Healthcare Facilities in promoting building codes has also been emphasized within the case studies, particularly that of St. Kitts and Nevis. While several resources have been made available through this initiative, there is need for greater implementation of these as was consistently recognized within the region. One of the available resources emerging from the initiative is the model policy for smart health facilities⁴ which builds on the established principles and priorities which governments in the Caribbean use to improve resilience of these facilities. The policy also provides a platform for integrating initiatives currently underway that seek to make facilities both structurally and non-structurally resilient to hazards and producing a small environmental footprint.

Another valuable instrument emerging from this project is the Smart Hospital Toolkit⁵. This serves as a practical guide for hospital administrators, health disaster coordinators and other stakeholders for achieving Smart Health Facilities, through the conservation of resources, cutting of costs, increasing of efficiency in operations and the reduction of carbon emissions.

Discussion on Costs and Benefits

Benefits of advancing and adopting risk reduction-based building codes and strengthening training and enforcement

Positive Outcomes and Negative Outcomes Avoided

In pursuing this recommendation, there would be an increase in capacity of personnel in government Ministries, aiding the mainstreaming of DRR across sectors⁶. Another benefit to be obtained from this investment is increased data sharing across Ministries, departments and agencies, promoting more congruent systems. Ultimately, capacity development is one of the most critical areas in achieving a reduction in disaster risks and ultimately a more resilient Caribbean.

An investment in building the capacity of the public sector would reduce the need to outsource for certain DRR undertakings, which can reduce expenditure and debt.

³ <https://codes.iccsafe.org/public/document/IBC2018>

⁴ https://www.paho.org/disasters/index.php?option=com_docman&view=download&category_slug=smart-hospitals-toolkit&alias=2141-a-model-policy-for-smart-health-facilities&Itemid=1179&lang=en

⁵ http://health.bmz.de/what_we_do/climate_health/adaptation_measures/siem_reap_adapt_climate_health_risks/dateien/SmartHospitalsToolkit.pdf

⁶ <https://www.eesi.org/papers/view/the-value-and-impact-of-building-codes#6>

Costs associated with advancing and adopting risk reduction-based building codes and strengthen training and enforcement

Resources Expended and Negative Outcomes

While capacity building in DRR can reap several rewards, it is never a one-time endeavour. Capacity building requires sustained efforts for long-term effectiveness. In this vein, budgetary considerations should always be given for capacity building.

2. Incorporate watershed and flood risk management in national land-use planning process

Similar to recommendation number one, this recommendation is rooted in Regional Outcome 3.2 (Hazard information integrated into development planning and work programming for priority sectors) and has been proposed by the case study coming out of St. Vincent and the Grenadines.



The CDM Strategy 2014-2024 within Priority Area Three provides support for the use of Watershed Management as a traditional tool for use in the promotion of environmental management. The Strategy states that both pre-existing and new tools may be used in hazard mitigation and for disaster recovery and rehabilitation efforts for the maintenance of ecosystem values and functions. It is also emphasized that decisions taken post hazards should not cause further degradation of habitats as they likely also support livelihoods and degradation of these habitats may reduce the biodiversity values of an area.

Land-use planning has moved toward a more risk-based approach, which incorporates improved definitions of levels of risk for more effective planning for natural hazards. A notable tool which is available was highlighted in a publication by Saunders, Beban and Kilvington (2013)⁷ entitled 'Risk-based land use planning for natural hazard risk reduction'. The tool proposed a five step system for the proper consideration of not only flood risk but for risks associated with other hazards. The five steps are:

1. Know your hazard
2. Determine the severity of the consequences
3. Evaluate the likelihood of an event
4. Take a risk-based approach
5. Monitor and evaluate

Although the toolkit finds its origin in New Zealand, its broad-based approach may also be applied to the Caribbean experience.

⁷http://isref.co.nz/docs/GNS_MS_67_Risk_based_land_use_planning.pdf

Another guide for risk-based land use planning emerges from Canada⁸ and possesses an additional step within the process, however, it bears significant similarities to the New Zealand guide and may also be applied to the Caribbean context to help guide planning.

At the time of writing, a UNEP-CARPHA implemented project encompassing the tenets of effective land use planning and watershed management was underway within the Caribbean.⁹ The Objective of this GEF funded initiative is to *“contribute to the preservation of Caribbean ecosystems that are of global significance and the sustainability of livelihoods through the application of existing proven technologies and approaches that are appropriate for small island developing states through improved fresh and coastal water resources management, sustainable land management and sustainable forest management that also seek to enhance resilience of socio-ecological systems to the impacts of climate change.”*

This project certainly embodies the core of this recommendation and further addresses larger regional and international goals for sustainable development. Lessons learned and approaches utilized may be replicated within other jurisdictions in order to strengthen overall land use planning and environmental management.

Discussion on Costs and Benefits

Benefits of watershed and flood risk management in national land-use planning process

Positive Outcomes and negative outcomes avoided

Watershed and flood risk management serve as critical elements of the land use planning process. The presence and proper use of these provide a better understanding of the most at-risk flood-prone areas, helping to protect watershed communities from natural hazards such as flooding and erosion. The preservation and enhancement of watershed land and water resources and the accompanying ecosystem services would also result. Elements such as floodplain mapping will be able to provide accurate data, both geographic and hydrologic to aid in the guidance of land-use planning. Again, this recommendation ultimately lends itself to the reduction of disaster losses.

Costs associated with pursuing watershed and flood risk management in national land-use planning process

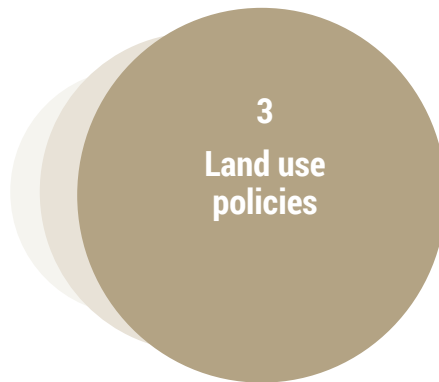
Resources expended and negative outcomes

Significant financial and technical resources are needed in seeking to fully incorporate watershed and flood risk management into land use planning. In many cases there would be need to outsource personnel with the required technology, which would require additional costs.

⁸ https://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/download_e.web&search1=R=295981

⁹ <http://cep.unep.org/gef-iweco-1/gef-iweco>

3. Develop land use policies which include improved lands, water and river management and the rehabilitation of degraded forests



This recommendation follows a similar path as the previous, with Regional Outcome 3.2 being the central linkage to the CDM Strategy. Its articulation zeros in on the need for improved lands, water and river management and the rehabilitation of degraded forests and goes one step further to highlight the need for policy support of these actions.

The Caribbean Region comprises a number of water-scarce nations. A water-scarce country is one that has available less than 1000 m³ of water per capita per year. Countries such as Barbados and Antigua and Barbuda rely heavily on groundwater, while others have available to them surface water

abstractions such as rivers. Residual forest cover exists in the majority of countries in the region; however, this is now predominantly confined to the interior parts of the countries, which are largely inaccessible. The forested areas serve firstly as reservoirs for a range of biological resources but are vital for watershed and aquifer protection and by extension water supply.

Given the inherent connection among these, the implications associated with water availability post disaster as well as possible health implications due to contamination of water supply and the critical role of adequate watershed management in reducing risks associated with flooding, these areas were seen as important to be regulated by policy. Several Caribbean Countries have National Action Plans and some possess formally-approved policy instruments that govern these, while others exist in draft. However these instruments possess little power of enforcement.

The project being undertaken by the UNEP also addresses policy and institutional strengthening generally, as a key consideration to improving the conditions of watershed and overall environmental sustainability. Within the project document, critical information on the status of participant countries and best practices in the area of adequate land use, including water resources management and reduction of forest degradation may be replicated.

Practitioners may be guided by the UN-HABITAT-published book “Land and Natural Disasters”, which offers a range of policy steps and options for addressing land issues in the response and recovery phases of the disaster management cycle (UNHABITAT 2010).

Discussion on Costs and Benefits

Benefits of developing land use policies which include improved lands, water and river management and the rehabilitation of degraded forests

Positive Outcomes and negative outcomes avoided

This recommendation also reflects the benefits of the aforementioned recommendations in this Priority Area, coupled with those associated with strengthened institutional capacities, as noted in Priority Area One. Land use policies which address critical areas of watershed management would aid in identifying and solidifying countries' position on these issues and setting a clear path towards development in light of these.

The absence of clear policy direction attending to issues of water and river management, improved lands and the rehabilitation of degraded forests, can lead to a lack of impetus for action in addressing these issues. Therefore, having this direction would avoid losses associated with flooding, which can be perpetuated by the presence of communities in flood prone areas.

Costs associated with developing land use policies which include improved lands, water and river management and the rehabilitation of degraded forests

Resources expended and negative outcomes

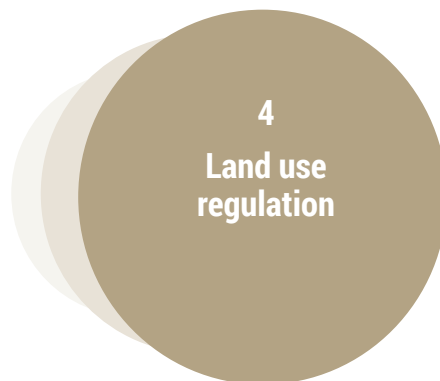
The resources expended in order to pursue this recommendation would include finances, personnel and time associated with development and implementation.

4. Identify and act on the development of required legislation to manage land-use in high risk areas particularly in recurrent floodplain zones

Finally, this recommendation highlights the advancement of effective land-use management through legislation. Again, its linkage to the CDM Strategy is Regional Outcome 3.2.

In the Caribbean, flood risk is among the highest ranking disaster risks. Flooding is linked not only to infrastructural incapacities such as poor drainage systems and in many cases, poor agricultural practices but with the presence of rivers in varying sizes and the natural resultant spill ways, or flood plains, which are associated with these. With the majority of Caribbean countries being riverine in nature, these floods are not uncommon. The high exposure of individuals and communities in flood plains have resulted in losses and damage over the years and as such, strongly enforced legislation is required to manage land use in these areas. Coastal areas are also high risk areas in which strong legislation is needed due to the impending risk associated with both rapid and slow onset events such as storm surge and sea level rise respectively. Within the Caribbean, the majority of settlements exist along the coastline and significant economic and cultural wealth exists there, thus creating higher risks due to significant exposure.

Most countries possess town and country planning legislation which is generally geared towards the control of building infrastructure development and therefore in many cases land use within floodplains is addressed. While these exist, there is a low level of enforcement due to the lack of capacity within state institutions, which usually bear the responsibility.



Specifically, there are several approaches to flood plain management, one of which is highlighted by The Nature Conservancy, called Floodplains by Design¹⁰. This approach utilizes both structural and non-structural mechanisms in order to reduce flood risk and if tried and applied in the Caribbean, may be legislated for greater reduction of losses within floodplains.

In order for successful legislation to be passed in this area there is need for input from national government stakeholders such as the National Disaster Offices, the Ministries of Finance, Ministries of Works, Planning Departments and government agencies responsible for drainage and hydraulic works.

Discussion on Costs and Benefits

Benefits of developing required legislation to manage land-use in high risk areas particularly in recurrent floodplain zones

Positive outcomes and negative outcomes avoided

There are several positive outcomes to be had from the development of legislation to manage land-use in high risk areas such as flood plains. Robust legislation along with a strong enabling environment can serve as a cornerstone for supporting policies and plans aimed at minimising risks associated with high risk areas. Legislation presents further strength and opportunity for enforcement of the tenets which are presented through policy.

Costs associated with developing required legislation to manage land-use in high risk areas particularly in recurrent floodplain zones

Resources expended and negative outcomes

In the development of robust legislation, significant time would be needed, specifically if there is no existing legislation on which to build. This effort would also require adequate financial resources as well as technical capacity. Studies such as Mucklestone (1983) have indicated that the introduction of floodplain regulation enforcement did not show effects on residential land value. Nonetheless, policymakers and practitioners should be made aware of the possible effect of the enforcement on land values in their particular national contexts.

¹⁰ <https://www.nature.org/photos-and-video/video/what-is-floodplains-by-design>

PRIORITY AREA FOUR

Increased and Sustained Community Resilience

Priority Area Four recommendations which mapped to the CDM Strategy 2014-2024, covered areas of Community Organisations, PDNAs, risk transfer options as well as hazard and risk assessment and hydromet monitoring systems. Specifically, these are:

1. Enhanced promotion and support of local Community DRR Organisations
2. Investigate and develop risk transfer options with respect to government assets and private sector losses
3. Address critical gaps in data needed to generate hazard and risk assessment particularly with respect to hydromet monitoring systems

1. Enhanced promotion and support of local Community DRR Organisations

The first recommendation of Priority Area Four aligns with Regional Outcome 4.2- Community Based Disaster Management capacity built/strengthened for vulnerable groups. This recommendation, proposed within the Barbados Case Study, draws attention to the role of communities in building resilience.



There have been several tools made available within the region regarding Community Based Disaster Risk Management (CBDRM) and the literature is generally replete with global examples of CDBRM good practices that can be applied to the Caribbean context.

Within the region, there is a Standard Community Resilience Framework for CDEMA Participating States in draft form which may be accessed directly through CDEMA. This Framework outlines the key components to be considered in the development of

a Community Resilience Framework at the national level, which have been adapted from John Twigg's "Characteristics of a Disaster-Resilient Community"¹¹. According to Twigg (2009), these elements are:

1. Policy and political commitment
2. Legal and regulatory systems
3. Integration with development policies and planning
4. Integration with emergency response and recovery
5. Institutional mechanisms, capacities and structure, allocation of responsibilities
6. Partnerships
7. Accountability and community participation

¹¹ https://www.preventionweb.net/files/2310_Characteristicsdisasterhighres.pdf

Several tools currently available for strengthening CBDRM within the region, which have all guided the completion of the Community Resilience Framework are as follows:

- i. Austrian Development Agency (ADA) funded Mainstreaming Climate Change Adaptation in Disaster Management in the Caribbean (specific reference to the Climate Smart Community Disaster Management programme)
- ii. ACP-EU Model Community Disaster Preparedness Programme Toolkit for CDEMA Participating States
- iii. Building Disaster Resilient Communities (BDRC) Programme – Office of Disaster Preparedness and Emergency Management, Jamaica
- iv. Characteristics of a Disaster Resilient Community – Dr. John Twigg, University College London
- v. IFRC Report on Community Resilience Characteristics
- vi. IFRC Framework for Resilience
- vii. Strategic Targeting Methodology guidelines and manual

In order to facilitate the achievement of community resilience, support should be provided to community groups in the form of financial assistance, training, provision of tools and equipment for response activities post-hazard and increased engagement in the decision making processes.

Discussion on Costs and Benefits

Benefits of enhanced promotion and support of local Community DRR Organisations

Positive Outcomes and Negative Outcomes avoided

In lending support to local community DRR organisations, a sense of empowerment can be generated among local communities. Further, in equipping local groups with the tools needed to complete complex tasks in their communities, there would be reduced burden on National Authorities in response and recovery, as well as mitigation and preparedness. Increased participation of individuals at the local level in the decision making process would also result from an investment in the capacity of DRR community groups.

Cost of enhanced promotion and support of local community DRR Organisations

Resources expended and negative outcomes

In order to facilitate a higher level of promotion and support of local DRR organisations, there is need for finances and personnel to conduct adequate training. Dedication of time will also be required. The Government of the Republic of Maldives recognized hindrances to capacity development, which is required to sustain a cadre of knowledgeable human resources, such as high-frequency staff transfers. Under their National Community Based Disaster Risk Reduction (CBDRR) Framework, they offered a number implementation arrangements and opportunities, including: the promotion of an incentive scheme for active facilitators of Community-Based Disaster Risk Reduction; the development of a national database of human capacities; and the promotion of long-term behavioural change amongst youth (NDMC, 2014).

2. Investigate and develop risk transfer options with respect to government assets and private sector losses



This recommendation aligns with Regional Outcome 4.4 of the CDM Strategy which requires that community livelihoods are safeguarded and strengthened through effective risk management.

Within the last decade several risk transfer options were made available through the Caribbean Catastrophe Risk Insurance Facility, now a Segregated Portfolio Company (CCRIF SPC) and the first multi-country risk pool in the world. CCRIF SPC provides parametric insurance products to governments covering excess rainfall, earthquake and tropical cyclones. According to CCRIF's 2016-2017 Annual Report¹², the company paid out a

total of USD\$130.5 million between June 2007 and October 2017 over thirty-six payouts made to thirteen member governments. All payments of the CCRIF have been made within fourteen days of a claim having been made. Barbados, Belize, St. Lucia, St. Vincent and the Grenadines, Dominica, Turks and Caicos and the Bahamas are all countries which benefited from this product. During the stirring hurricane season of 2017, CCRIF SPC paid out a total of USD \$61,417, 489 across 10 affected countries.

Regarding private sector risk transfer products in support of livelihoods, the CCRIF is engaged with several stakeholders to develop parametric insurance products to be marketed to the fisheries sector through a programme called the Caribbean Oceans and Aquaculture Sustainability Facility (COAST). One of the main outcomes of this initiative will be to increase the insurance penetration and the number of fishers indirectly covered by climate-risk insurance.

Over the period 2010-2014, CCRIF partnered with the Munich Climate Insurance Initiative to implement a project called the Climate Risk Adaptation and Insurance in the Caribbean project. Through this project, two products were developed, one of which targeted individuals whose livelihoods could be lost as a result of a climate-related hazard. The Livelihood Protection Policy (LLP) helps vulnerable low income individuals such as labourers and farmers by providing swift cash payouts following extreme weather events.

¹² https://www.ccrif.org/sites/default/files/publications/CCRIFSPC_Annual_Report_2016_2017.pdf

Discussion on Costs and Benefits

Benefits of investigating and developing risk transfer options with respect to government assets and private sector losses

Positive outcomes and negative outcomes avoided

In developing risk transfer options to secure public and private sector assets, there is the opportunity to extend the safety nets of these groups, as risk transfer instruments (and other ex-ante financing options) may serve as an addition to a suite of risk management strategies that include risk reduction and prevention like ex-post Disaster Risk Finance Instruments¹³. In utilizing varied types of risk transfer instruments including micro-, meso- and macro-level insurance, there is less burden on governments, and parties down to the household level are able to address losses occurring from hazards. One group that may be particularly excluded from these insurance products would be the poor. Government programmes may therefore need to be accessed, designed or enhanced in or to fill this gap as a means of benefitting the most economically vulnerable. One study suggests the establishment of “creative alliances among NGO/community groups, microfinance organizations, government regulators, entrepreneurs, and international financial and donor institutions in pioneering microinsurance programs” (Mechler et al, 2006). In this way, a way can be considered for private insurers to be able to offer low-cost instruments with government and donor backing.

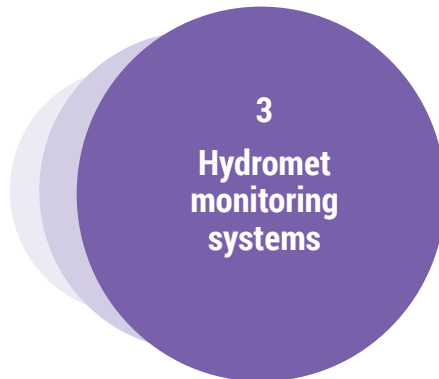
Costs associated with investigating and developing risk transfer options with respect to government assets and private sector losses

Resources expended and negative outcomes

At every level of risk transfer/insurance, there are required payments, facilitated through a plan or framework which is usually designed to fit the needs of the insured individual/business/country. However, according to Dercon and Clarke (2016), more important than the insurance products themselves are governments' actions in functioning in accordance with the principles and processes of insurance, if DRR improvements are to be catalysed.

¹³ https://www.unisdr.org/files/globalplatform/591d4f658e046Risk_transfer_and_insurance_for_disaster_risk_management_evidence_and_lessons_learned.pdf

3. Address critical gaps in data needed to generate hazard and risk assessments particularly with respect to hydromet monitoring systems



This, the third recommendation emerging out of Priority Area Four, links with the CDM Strategy from dual perspectives. Firstly, the element concerned with data gaps and hazard and risk assessment is associated by nature with Priority Area Two which deals with knowledge management and learning for CDM. Secondly, the specification of hydromet monitoring systems zeros in on Regional Outcome 4.3- **Community Early Warning Systems integrated, improved and expanded.**

In general, there is no surprise in the suggestion that data gaps need to be addressed for the generation of hazard and risk assessments as this generally has been an area which required attention. While there have been hazard and risk assessments conducted in the past, the CDM audit (2016) states that assessments in the participating countries have been weak.

Within the region, the Caribbean Institute for Meteorology and Hydrology is the lead entity for the generation of hydro meteorological data. Its mission is to improve the hydrological and meteorological services and to assist in promoting awareness and economic well-being within its 16 member countries. The institute collects, analyses and publishes meteorological and hydrological data daily from its thirty-eight stations which is available at CIMH. The CIMH maintains data records which date back to 1970 in temperature, humidity, wind speed and direction, atmospheric pressure, cloud types, precipitation and other types of weather elements. Both hourly and daily readings are available (CIMH 2018).

The National Oceanic and Atmospheric Association (NOAA) in the United States also provides hydromet data through a range of satellites and forecast tools.

Discussion on Costs and Benefits

Benefits of addressing critical gaps in data needed to generate hazard and risk assessment particularly with respect to hydromet monitoring systems

Positive Outcomes and negative outcomes avoided

In addressing this recommendation, there is expected to be increased data which would aid to support more accurate assessments and better decision making. In the long term, with proper planning, there would also be a reduction in disaster losses due to flooding and other associated hazards. Future research efforts also stand to benefit from addressing data gaps.

The lack of high-resolution data results in there being more generalized models of hazard and risk, which are less reliable for specific applications. By addressing this recommendation, more calibrated models would be produced and more detailed plans can be based on them. Costs associated with addressing critical data gaps needed to generate hazard and risk assessment particularly with respect to hydromet monitoring systems

Resources expended and negative outcomes

The most notable costs associated with this recommendation would be financial resources needed to obtain the correct infrastructure to facilitate hydromet monitoring as well as the technical capacity to identify data gaps and generate hazard and risk assessments.

The latest regional project entitled “Strengthening Hydro-Meteorological and Early Warning Services in the Caribbean” bears a component for supporting the piloting of high priority national activities including impact-based forecasting amounting US\$2,200,000.00. The key output of this project component would be regional monitoring, forecasting and warning products for extreme events.

**GENDER
MAINSTREAMING IN
COMPREHENSIVE
DISASTER
MANAGEMENT (CDM)**



5 GENDER MAINSTREAMING IN COMPREHENSIVE DISASTER MANAGEMENT (CDM)

Within the CDM Strategy, gender mainstreaming in CDM is said to comprise “the assessment of the differences in vulnerabilities between women and men, girls and boys, and how these vulnerabilities should be taken into account in the design of policies, strategies and programmes aimed at safeguarding our populations in the face of the negative effects of disasters and in the recovery and reconstruction thereafter.” Box 1 below highlights the specific recommendations which fell under the cross cutting theme of gender.

Three explicit gender related recommendations made:

1. Promote the inclusion of women and youth in local Community DRR Organisations
2. Collection of gender disaggregated data in all areas of data collection
3. Place emphasis on the needs of vulnerable groups such as single parent families (especially those headed by females) and the elderly

1. Promote the inclusion of women and youth in local Community DRR Organisations

The Barbados Case Study highlighted the growing role of women in leadership positions in local parish councils is an important phenomenon to note. With women in these leadership roles, it provides evidence over the long term that women can and do perform at the same levels or greater than men in these important decision making and resource allocation roles. It reduces possible prejudices towards women in leadership at the very community level and this contributes to societal change in the long run. While this situation has evolved uniquely over time, it is not at all widely prevalent in all spheres and levels of community governance in Barbados or the Caribbean. As such, a women’s leadership quota policy should be opened for discussion within the sphere of disaster risk management and more broadly in community development. This provides a secure mechanism to build community confidence in women leadership and in women themselves that they can and should lead. Such programs have solid precedence of success with examples from Rajasthan, India (Banerjee, Duflo, Pande 2011, Empowering Female Leaders and voters in Rajasthan, India) to Botswana (Pande and Ford, 2011).

2. Collection of gender disaggregated data in all areas of data collection

The St. Vincent case study has identified gender as an important cross-cutting issue in Post-Disaster Needs Assessment, and therefore warrants the collection of gender-disaggregated data. 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 characterized 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.

3. Place emphasis on the needs of vulnerable groups such as single parent families (especially those headed by females) and the elderly

The Barbados case study did a particularly good job at recommending the diversification of forms of gendered service opportunities available to women and men. The study provided an example of women being less likely to participate in nightly meetings when they are expected to tend to children, while sick and elderly while men were cited as being less likely to attend during mid day hours when they participate in the formal workforce.

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APPENDIX



APPENDIX 1 - LESSONS LEARNED TABLE

Priority Area	No.	Recommendations BY PRIORITY AREA	Benefits of Recommendation	Costs/Disadvantages of Recommendations	Target Implementor(s)/ Relevant Stakeholders	CDM Priority Area(PA) National/Regional Outcome (RO)	Potential Indicator for Implementation Plan
PRIORITY AREA ONE	1	Strengthened governance mechanisms for DRR at the National Level	<ul style="list-style-type: none"> • Provides a medium through which multiple sectors can assemble to discuss matters concerning the advancement of CDM • Helps to alleviate the issue of initiatives being actioned in an in-silos manner 	<ul style="list-style-type: none"> • Requires significant amount of time on a reasonably consistent basis 	<ul style="list-style-type: none"> • Policy Makers 	Priority Area 1- Strengthened Institutional Arrangements for CDM Regional Outcome 1.1 - National Disaster Organisations and CDEMA CU strengthened for effective support of the implementation, monitoring and evaluation of CDM in Participating States	Number of countries with a functioning National CDM governance mechanism present
	2	Enact DRR/CDM legislation	<ul style="list-style-type: none"> • Legal foundation to guide all phases of the DRM cycle • Inclusion of priority themes critical to resilience building • This can be done with relative ease due to the presence of the model CDM legislation which was developed by CDEMA. • Demonstrates government commitment to CDM 	<ul style="list-style-type: none"> • Buy-in of policy makers due to competing priorities • Updating legislation has traditionally required a significant amount of time and as such, it may be years before completion 	<ul style="list-style-type: none"> • Policy Makers 	Priority Area 1- Strengthened Institutional Arrangements for CDM Regional Outcome 1.2- CDM is integrated into policies strategies and legislation by Participating States	Number of countries with enacted DRR/CDM legislation
	3	DRR/CDM Policy or Strategy	<ul style="list-style-type: none"> • Provides strategic direction for implementation of country specific DRR actions within a set time frame 	<ul style="list-style-type: none"> • Lack of adequate financial and technical resources for the completion 	<ul style="list-style-type: none"> • Policy Makers 	Priority Area 1- Strengthened Institutional Arrangements for CDM Regional Outcome 1.2- CDM is integrated into policies strategies and legislation by Participating States	Number of countries with CDM Policy

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PRIORITY AREA TWO	4	Conduct Hazard and Vulnerability Assessments	<ul style="list-style-type: none"> • Prioritization of communities for DRR initiatives • Provision of reliable and readily available data for future research and decision making processes 	<ul style="list-style-type: none"> • Lack of adequate financial and technical resources within National Offices • May require external technical assistance 	<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners • Communities 	Priority Area 2- Increased Knowledge Management and Learning for CDM Regional Outcome 2.3 - Incorporation of community and sectoral based knowledge into risk assessment improved Priority Area 4- Strengthened and Sustained Community Resilience	Number of countries with hazard and vulnerability assessments conducted within the majority (85%?) of parishes/communities
	5	Identify capacity gaps and provide tailored training in disaster risk reduction for staff in key ministries	<ul style="list-style-type: none"> • Increased coordination among key Ministries on DRR issues • Reduction in the duplication of efforts • Pooling of technical capacities for DRR actions Nationally 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners • Communities 	Priority Area 2 - Increased Knowledge Management and Learning for CDM Regional Outcome 2.1- Regional Disaster Risk Management Network for informed decision-making at all levels improved Priority Area 4- Strengthened and sustained community resilience	Number of staff members within key Ministries (need to identify) who are trained in DRR
	6	Improve interagency data sharing and archiving	<ul style="list-style-type: none"> • Improves data availability among agencies • Avoids duplication of activities • Better use of financial resources 	<ul style="list-style-type: none"> • May require investments into information and communication technologies to facilitate processes 	<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 2- Increased Knowledge Management and Learning for CDM Regional Outcome 2.1- Regional Disaster Risk Management Network for informed decision-making at all levels improved Regional Outcome 2.2 - Integrated systems for fact based policy and decision making established Priority Area 3- Improved integration of CDM at sectoral levels	Number of countries with at least one national data sharing platform

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PRIORITY AREA THREE	7	Advance and adopt risk reduction-based building codes and strengthen training and enforcement in these areas	<ul style="list-style-type: none"> • Maintains consistent standards for safe buildings • Overall reduction of losses from disasters • Promotes longterm change 	<ul style="list-style-type: none"> • Lack of personnel for enforcement 	<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 3- Improved Integration of CDM at Sectoral levels Regional Outcome 3.2 - Hazard information integrated into development planning and work programming for priority sectors	
	8	Incorporate watershed and flood risk management in the national land-use planning process	<ul style="list-style-type: none"> • Aids in the analysis of impacts of floods and implement measures to manage and respond to these • Reduction of losses associated with flooding 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 3- Improved Integration of CDM at Sectoral levels Regional Outcome 3.2 - Hazard information integrated into development planning and work programming for priority sectors	
	9	Identify and act on the development of required legislation to manage land-use in high risk areas particularly in recurrent floodplain zones	<ul style="list-style-type: none"> • Aid in preparation for future disaster loss events. • Avenue for discussion on options for government self insurance, formal support systems for low income citizens as well as private sector insurance requirements 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 3- Improved Integration of CDM at Sectoral levels Regional Outcome 3.2 - Hazard information integrated into development planning and work programming for priority sectors	
	10	Adopt a watershed management legal framework			<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 3- Improved Integration of CDM at Sectoral levels Regional Outcome 3.2 - Hazard information integrated into development planning and work programming for priority sectors	Number of countries with a legal framework specific to watershed management
	11	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 (e.g. survives 100, 200, 500 wind, flood, seismic event)	<ul style="list-style-type: none"> • Reduction in damage to infrastructure such as roads and bridges after an event • Proactive approach vs reactionary which reduce risks 	<ul style="list-style-type: none"> • High upfront cost 	<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 3- Improved Integration of CDM at Sectoral levels Regional Outcome 3.2 - Hazard information integrated into development planning and work programming for priority sectors	

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	12	Develop land use policies which include improved lands, water and river management and the rehabilitation of degraded forests	<ul style="list-style-type: none"> • Addresses the cross cutting theme of Environmental Sustainability within the CDM Strategy 2014-2024 • Seeks to preserve the ecosystem services which are found in the watershed • Reduces impacts of flooding 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 3- Improved Integration of CDM at Sectoral levels Regional Outcome 3.2 - Hazard information integrated into development planning and work programming for priority sectors Priority Area 1-	Number of countries with land use policies aimed at risk reduction
PRIORITY AREA FOUR	15	Enhanced promotion and support of local Community DRR Organisations	<ul style="list-style-type: none"> • Generates a sense of ownership within communities • Increases capacity of members of these organisations to manage vulnerabilities at the local level as well as be first responders in the face of a hazard • Higher level of exposure for community groups which may result in increased participation • Increased financial and logistical resources for community groups 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 4- Strengthened and Sustained Community Resilience	Number of countries with functioning local DRR organisations spanning the majority (85%?) of parishes/communities
	16	Conduct gender sensitive Post Disaster Needs Assessments with a focus on livelihoods	<ul style="list-style-type: none"> • This aids in addressing the needs of vulnerable groups such as women (who are generally found in service industries which are not functional immediately after an event) • Can lead to facilitate the start of economic activity within a country after an event when these needs are met 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 4- Strengthened and Sustained Community Resilience	

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	17	Investigate and develop risk transfer options with respect to government assets and private sector losses	<ul style="list-style-type: none"> • Reduction in the amount of external financial assistance needed post-disaster over time • Presents an opportunity for private and public sector partnership • Opportunity for the development of innovative+risk transfer options 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 4- Strengthened and Sustained Community Resilience Regional Outcome 4.4- Community livelihoods safeguarded and strengthened through effective risk management	
	18	Address critical data gaps needed to generate hazard and risk assessment particularly with respect to hydromet monitoring systems	<ul style="list-style-type: none"> • Facilitates adequate planning for future hazard events by providing a more comprehensive picture of the risks • Will lead to more robust policy and projects, particularly as it relates to hydromet monitoring systems 		<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 4- Strengthened and Sustained Community Resilience Regional Outcome 4.3- Community Early Warning Systems integrated, improved and expanded	
	19	Install additional meteorological and stream gauging stations at a density to accommodate engineering scale analysis for design and planning			<ul style="list-style-type: none"> • Policy Makers • DRR Practitioners 	Priority Area 4- Strengthened and Sustained Community Resilience Regional Outcome 4.3- Community Early Warning Systems integrated, improved and expanded	Number of countries with stream gauging systems installed in priority locations

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/>