STATUS OF DISASTER RISK MANAGEMENT

PLANS FOR FLOODS, HURRICANES AND DROUGHT IN THE AGRICULTURE SECTOR

A CARIBBEAN PERSPECTIVE

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EXECUTIVE SUMMARY

This report presents the findings of a study commissioned by the Food and Agriculture Organization of the United Nations (FAO) to review the status of development and implementation of disaster risk management (DRM) plans for the agriculture sector throughout the Caribbean. Specifically, the assignment was designed to achieve the following objectives:

- determine the availability of DRM plans for droughts, hurricanes and floods in the agriculture sector throughout 20 Caribbean countries, namely: Anguilla, Antigua and Barbuda, the Bahamas, Barbados, Belize, British Virgin Islands, Cuba, Dominica, the Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago and Turks and Caicos; and

- review existing plans to identify best practices, shortcomings, challenges and areas where development agencies may assist countries to complete and implement these plans.

The results of the study were presented at a writeshop formulated to strengthen member countries' capacities to develop and implement comprehensive DRM plans for the agriculture subsectors during the period 17–19 January 2012.

Data was collected from 19 countries out of the 20 (therefore 95 percent) that were invited to participate in the study.

- The study revealed a very low prevalence of agriculture DRM (ADRM) plans within the Caribbean. Only six countries (out of the total 19, therefore 31.6 percent) – Belize, the Dominican Republic, Grenada, Jamaica, Saint Lucia and Saint Vincent and the Grenadines – reported having draft plans in place to address related hazards. Thirteen countries (68.4 percent) reported not having, or being unsure of the presence or absence of, a DRM plan for the agriculture subsector.

- Consultant support, implementation of DRM-related projects and countries' experiences with the devastating impacts of recent natural hazards were identified as major contributing factors to plan development.

- Caribbean Ministries of Agriculture (MoAs) appeared to place a low priority on the development of ADRM plans, despite the devastating impacts of natural hazards on the subsector in the last decade.

- A disconnect exists, therefore, between the impacts of natural disasters on Caribbean agriculture economies and the importance of ADRM plans within MoAs in the region.

- Capacity constraints represented the most significant limiting factor to ADRM plan

development, according to MoA officials. However, the extent to which MoAs are proactively exploring opportunities for technical and financial assistance to develop DRM capacities and/or champion the need for DRM planning, requires further analysis.

- Three country groupings emerged based on the status of development and implementation of ADRM plans:

  1) countries with draft ADRM plans, namely Belize, the Dominican Republic, Grenada, Jamaica, Saint Lucia and Saint Vincent and the Grenadines;

  2) countries in the process of developing plans, namely the British Virgin Islands; and

  3) countries with no plans, to include all of the other 12 countries that participated in the study.

Facilitating completion and implementation of ADRM plans within each of the above groups requires slightly different modalities to achieve the expected outcome.

As the region moves beyond the writeshop, the following should be prioritized, if planned targets for DRM within the region are to be expected.

- Member countries should promote the development of an ADRM champion within the various MoAs, through the establishment of an ADRM Focal Point and/or DRM Coordinator (*timeline: short-term*).

- Urgent action is required by member countries to facilitate the completion and implementation of DRM plans, based on the current status as indicated by this study. This should be coupled with an aggressive drive to mobilize technical and financial resources to implement ADRM plans (*timeline: short-term*).

- FAO, in collaboration with its development partners, should support the development and implementation of a regional project designed to develop ADRM plans particularly within countries from the second and third groups mentioned above, and strengthen capacities for risk reduction in the agriculture sector. The following are priority areas for capacity building at the regional level:

  - risk identification;
  - development of disaster preparedness, mitigation, recovery and rehabilitation action plans;
  - institutional strengthening;
  - mainstreaming climate change adaptation, gender and the needs of vulnerable groups in ADRM plans;
  - articulation of integrated resource mobilization strategies for ADRM plan implementation (*timeline: short to medium term*); and

  - tools for monitoring and evaluating DRM plan implementation and the impacts of the intervention on the risk management performance of the agriculture sector (*timeline: short to medium term*).

- A number of pathways can be utilized to develop ADRM plans. Two of the most common include:

  - the comprehensive disaster management approach popularized by the Caribbean Disaster Emergency Response Agency, which focuses on the development of distinct action plans for reducing risk in each phase of the disaster cycle, as used in the case of the Jamaican DRM plan; and

  - development of risk reduction action plans based on the five priority areas of the Hyogo Framework for Action 2005–2015, as used in the case of the Belizean and Saint Lucian DRM plans.

- Implementation must become a culture within the region. The institutional framework within the MoAs in the Caribbean should be strengthened to foster implementation of ADRM and other key sectoral development plans. For example, the ADRM action plans should be mainstreamed into the annual work plan of the MoA staff (*timeline: short to medium term*).

- Scale up education programmes targeting all stakeholders, especially policy makers and senior administrative officials, to communicate the cost of no action to disaster risk reduction on livelihoods and national prosperity (*timeline: short to medium term*).

- Subsequent to the writeshop planned by FAO, a regional institution should be identified to monitor and hold countries accountable to develop and implement plans within an agreed timeframe (*timeline: short term*).

- A forum for sharing best practices and innovative technologies for ADRM plans (for example early warning systems, risk diversion schemes, data/information management) is recommended as a platform for maintaining contact with member countries after the writeshop, while also strengthening technical capacity within the MoAs (*timeline: short to medium term*).

Aerial shots of damage by Hurricane Mitch to agricultural land: African palm crops covered in mud.

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LIST OF ABBREVIATIONS

ADRM	Agriculture Disaster Risk Management
AECID	Spanish Agency for International Cooperation for Development
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Community
CCA	Climate Change Adaptation
CDEMA	Caribbean Disaster Emergency Management Agency
CDERA	Caribbean Disaster Emergency Response Agency
CDM	Comprehensive Disaster Management
DALA/DANA	Damage and Loss Assessment/Damage and Needs Assessment
DEGRYCC	Department of Risk Management and Climate Change – the Dominican Republic
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECLAC	Economic Commission for Latin America and the Caribbean
EWS	Early Warning Systems
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
HFA	Hyogo Framework for Action 2005–2015
IICA	Inter-American Institute for Cooperation on Agriculture
MALFF	Ministry of Agriculture, Lands, Forestry and Fisheries – Saint Lucia
MDGs	Millennium Development Goals
MoA	Ministry of Agriculture
MoAF	Ministry of Agriculture and Fisheries – Belize and Jamaica
NaDMA	National Disaster Management Agency – Grenada
NEMO	National Emergency Management Organisation – Belize and Saint Vincent and the Grenadines
NEMP	National Emergency Management Plan
NGO	Non-Governmental Organization
ODPEM	Office of Disaster Preparedness and Emergency Management – Jamaica
OECS	Organization of Eastern Caribbean States
RADA	Rural Agricultural Development Authority – Jamaica
SIDS	Small Island Developing States

INTRODUCTION

1.1 BACKGROUND AND CONTEXT

Natural disasters have had devastating impacts on the socio-economic and environmental landscape of the Caribbean within the last decade. On average, six natural disasters occurred in the region annually between 1970 and 2006, with higher incidences in Haiti and the Dominican Republic. The active hurricane season of 2004 resulted in damages in the Caribbean amounting to USD 3.1 billion,[1] with catastrophic impacts on the gross domestic product (GDP) of member countries, particularly Grenada (200 percent of GDP).[2] Similarly, Hurricane Dean in 2007 had a major destructive impact on the economies of Belize, Jamaica and Saint Lucia. Approximately 14 percent of the Saint Lucian population was affected, including 47 percent of the vulnerable community, with costs to the Jamaican and Belizean economies amounting to USD 329.34 million and USD 89.1 million, respectively.[3] According to the Centre for Research on the Epidemiology of Disasters,[4] damages from natural disasters in 2010 showed a different distribution than that seen for previous events. The Americas reported the major share of global damages (45.9 percent), attributed mostly to the 12 January 2010 earthquake in Haiti. Rasmussen[5] notes that these shocks may cause spillovers at the macroeconomic level, since fiscal and external pressures can lead to imbalances that spark economic crisis and an increased incidence of poverty.

The regional agriculture sector continues to be severely undermined as a result of natural disasters. Hurricane Ivan in 2004 decimated Grenada's agriculture sector and accrued losses in excess of USD 37 million. Ivan destroyed the entire banana industry and approximately 40 percent of mature cocoa trees. Almost all of the nutmeg trees[6] toppled (90 percent), with significant negative implications for the local rural economy.[7] Total annual average revenue available to farmers decreased by 89.9 percent, from USD 18.7 million during 2002–2004 to USD 1.9 million after the disaster (2005–2009).[8] Similarly, in 2007, Hurricane Dean ravaged Caribbean agricultural productivity. Jamaica reported damages of approximately USD 43 million. Overall, 56 537 crop farmers and 7 170 livestock farmers were seriously affected,

1 *Figure does not include costs associated with loss of human life, disruption of public services and human wellbeing, or increased poverty levels linked to loss of livelihoods.*

2 *Heger, M. Julca, A, and Paddison, O. 2008. Analyzing the impact of natural hazards in small economies - The Caribbean case. Research paper No. 2008/25. United Nations University and World Institute for Development*

3 *ECLAC. 2007. St. Lucia and Belize – Macro socio-economic assessment of the damages and loses causes by Hurricane Dean.*

4 *Guba-Sapir, D. Femke, V. Below, R. and S. Ponsirre. 2011. Annual disaster statistical review 2010 the numbers and trends. Available at http://www.emdat.be/.*

5 *Rasmussen, T. 2004. Macroeconomic implications of natural disasters in the Caribbean. IMF Working Paper WP/04/224.*

6 *Grenada was the second largest nutmeg producer globally, second to Indonesia.*

7 *OECS. 2004. Grenada – Macro-socio-economic assessment of the damages caused by Hurricane Ivan.*

8 *International Trade Centre. 2010. European Union ACP commodities program Caribbean region – Grenada nutmeg sector strategy. Available at http://www.euacpcommodities.eu/files/1CARB01_GRE_nut_Strategy_final_21June2010.pdf. Accessed on 24 November 2011.*

with the greatest impact being among smallholders.[9] Belize's agriculture sector documented damage and loss of USD 54 million[10], with the majority of costs recorded in the cropping subsector (90.6 percent). Saint Lucia's agriculture sector reported losses of roughly USD 10 million, with the banana industry accounting for 67 percent of the overall burden of the sector (USD 6.7 million).[11] The Economic Commission for Latin America and the Caribbean (ECLAC) posits that Hurricane Dean will have serious implications for future banana production in Saint Lucia, and predicted a reduction in banana export of USD 5.7 million up to February 2008.[12] Moreover, a Crop and Food Security Assessment Mission conducted by the Food and Agriculture Organization of the United Nations (FAO) in Haiti in September 2010 highlighted a decrease in the production of cereals (by 9 percent), pulses (by 20 percent), root crops (by 12 percent) and plantain (by 14 percent) when compared to previous years. Although the earthquake was largely an urban event, its effects resounded throughout the rural agricultural areas.[13]

A case study of the 2009–2010 El Niño-induced Caribbean drought reported startling impacts on the region's agriculture sector.[14] The study noted that vast amounts of finances were spent by some governments to mitigate the impacts of the drought. In Guyana, the Government allocated USD 1.3 million to bring relief to farmers in Region 2 in February 2010 and spent USD 16 000 daily in Region 5 to operate pumps and conduct other works essential to water delivery. The banana industry in Dominica reported a 43 percent reduction in production in 2010 compared to previous years. Similarly, the 2010 onion and tomato crops in Antigua and Barbuda decreased by 25 percent and 30 percent, respectively, due to water stressed conditions. Saint Vincent and the Grenadines documented a 20 percent overall decrease in agricultural productivity during the period. Impacts of the drought were also reflected to some extent in commodity prices.[15] Tomato prices in Saint Vincent and the Grenadines rose by 155 percent during the peak of the drought (February–March 2010). The Central Bank of Trinidad and Tobago reported an increase in the price of fruits in March 2010 by 20.1 percent when compared to February of the same year. According to the report, the drought-induced bush fires destroyed large acreage of citrus farms in the two-island republic, resulting in an increase in the cost of citrus importation from USD 6.3 million in 2008 to USD 8.3 million by the end of 2010. Grenada's preliminary assessment of the above drought conditions and bush fires on the agriculture sector in April 2010 reported a total of 38 small farmers affected in the northern and eastern districts, with total economic loss to the entire cropping sector, including the Maran Agriculture Station, amounting to USD 645 261.[16] Farrel *et al.*[17] emphasized that it is

9 *Planning Institute of Jamaica. 2007. Assessment of the socio-economic and environmental impact of Hurricane Dean on Jamaica.*

10 *Excludes impact on fisherfolk.*

11 *ECLAC. 2007. Belize and St. Lucia macro socio-economic assessment of the damages and losses caused by Hurricane Dean.*

12 *Ibid.*

13 *FAO. 2010. Haiti's most vulnerable communities rebuild their livelihoods. Available on http://www.fao.org/haiti-earthquake/faos-response/en/. Accessed on 24 November 2011.*

14 *Farrel, D. Trotman, A. and Christopher, C. 2010. Drought early warning and risk reduction – A case study of the Caribbean drought of 2009-2010 – Global assessment report on disaster risk reduction. Available at http://www.preventionweb.net/english/hyogo/gar/2011/en/bgdocs/Farrell_et_al_2010.pdf. Accessed on November 24, 2011.*

15 *Ibid.*

16 *Charles, R. 2010.Assessment report on the impact of drought and bush fires on the agriculture sector.*

17 *Ibid.*

imperative that the Caribbean Community (CARICOM) member countries mainstream their forecasting and alerting systems for drought, and develop and implement cost-effective policies for adapting and mitigating drought-related impacts.

The need to urgently integrate disaster risk management (DRM) in the agriculture sector is critical in light of the projected impacts of climate change and variability on Small Island Developing States (SIDS) within the Caribbean, the peculiar vulnerabilities of SIDS[18] and the moderate to high poverty levels of some states (see Box 1.1).[19]

Box 1.1: Poverty levels within select Caribbean states

Country	Percent poverty in population	Percent indigent in population
Dominica	40.0	-
British Virgin Islands	22.0	Almost absent
Saint Lucia	28.8	1.6
Grenada	37.7	2.4
Belize	43.0	16.0
Saint Vincent and the Grenadines	30.2	2.9
Dominican Republic	42.0	16.0
Haiti	65.0	32.3

In fact, many disaster-related losses can be avoided or reduced if appropriate policies and programmes are instigated to address the root causes of vulnerability, while also integrating mitigation, preparedness and response mechanisms into overall development planning.[20] The development of sectoral DRM plans for the agriculture sector at the national level represents, therefore, a powerful strategy for building resilience to natural hazards and forging a sustainable development pathway.

18 *Limited size and natural resource base, geographical dislocation, high exposure of population and infrastructure and limited adaptive capacity.*

19 *Based on national poverty assessment reports.*

20 *Baas, S., S. Ramasamy, J.D. DePryck, and F. Battista, 2008. Disaster risk management systems analysis – A guide book. Number 13 Environment and Natural Resources Management Series.*

1.2 CONCEPTUAL FRAMEWORK FOR DRM PLANS

1.2.1 The Hyogo Framework for Action 2005–2015

The Hyogo Framework for Action 2005–2015 (HFA)[21], driven by a need to build the resilience of nations and communities, elaborates a guiding agenda for disaster management globally for the ten-year period spanning from 2005 to 2015. It promotes the pursuance of the substantial reduction of disaster losses – including human lives and the social, economic and environmental assets of countries and communities – through the adoption of three strategic goals that are built on the following premises:

1) mainstreaming disaster risk considerations into sustainable development policies, planning and programmatic interventions with specific emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction;

2) strengthening institutional and administrative capacities to foster resilience, particularly at the community level; and

3) systematic incorporation of risk reduction into the design and implementation of emergency preparedness, response and recovery programmes for the reconstruction of affected communities.[22]

Action developed to achieve the expected outcome and strategic goals should take the following into consideration:

- the need for national responsibility for attainment of sustainable development goals and disaster risk reduction (DRR) objectives;
- concerted international cooperation that stimulates knowledge and capacity development for DRR;
- adoption of an integrated, multihazard approach to policy development and programming;
- employment of a gender perspective in DRM policies, planning and programming;
- cognizance of cultural diversity, age and vulnerable groups in DRR activities;
- empowerment of communities and local authorities;
- development of a culture of prevention that is affected through sustainable resource mobilization;
- recognition of the synergies between DRR and the attainment of the Millennium Development Goals (MDGs).

21 *Emanated from the World Conference on Disaster Reduction held in Kobe Hyogo Japan, 18–22 January 2005.*

22 *ISDR. 2007. Hyogo Framework for Action 2005-2015 Building the resilience of nations and communities to disasters – extract from the final report of the World Conference on Disaster Reduction (A/Conf.206/6). Available at http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf. accessed on 29 November 2011.*

Importantly, the HFA prioritizes five areas for action, as listed in Box 1.2. In addition, it emphasizes a focus on disaster-prone developing countries, especially least-developed countries and SIDS, due to their higher vulnerability and risk levels which often greatly exceed their capacity to respond to and recover from disasters.[23]

Box 1.2: Priority areas of the HFA

Ensure that DRR is a national priority with a strong organizational and policy basis for implementation.

1. Identify, assess and monitor disaster risks and enhance early warning.
2. Use knowledge, innovation and education to build a culture of safety and resilience.
3. Reduce the underlying risk factors.
4. Strengthen disaster preparedness and contingency planning for effective response.

1.2.2 The Caribbean Community Regional Framework 2005-2015[24]

In 2001, CARICOM (with leadership provided by the Caribbean Disaster Emergency Response Agency [CDERA])[25] adopted the comprehensive disaster management (CDM) strategy for the region, through a participatory process. The strategy was designed to provide a platform for regional unity and commitment to disaster loss reduction and the creation of an enabling environment to foster implementation of resultant programme areas.

For the period 2005–2015, CARICOM proposed to focus its programming on critical actions needed to implement five intermediate results of the CDM strategy and framework. These priority actions are as follows:

- hazard mapping and vulnerability assessment;
- flood management;
- community disaster planning;
- early warning systems (EWS);
- climate change; and
- knowledge enhancement.

23 *Ibid. pg 5.*

24 *Comprehensive Disaster Management Strategy and Programme Framework 2007–2012.*

25 *Now changed to the Caribbean Disaster Emergency Management Agency (CDEMA).*

This decision was adopted cognizant of the disaster risks of the region, the priorities promulgated for the World Conference on Disaster Reduction in 2005 (refer to Box 1.2), and the complex linkages between poverty, disasters and sustainable development.

Developing and strengthening resilience of nations and communities to the impacts of hazards represents the principal focus for the Caribbean region during the period under study. CARICOM declares that resource mobilization will be undertaken to expand and replicate several ongoing best practices throughout the region. In addition, at the national level, governments and civil society will be encouraged to integrate DRR principles into development decisions and programmes. The Caribbean region will therefore augment resilience through the pursuit of five courses of action, as listed below:

- governance – institutional and policy frameworks for risk reduction;
- knowledge management;
- community disaster planning;
- flood management; and
- adaptation to climate change.

Within the context of a DRM plan for the agriculture sector, the key objectives and expected outcomes for the latter three thematic areas are particularly relevant.

1.2.3 Enhanced CDM Strategy and Programme Framework 2007–2012

Consistent with the needs for adaptive management and monitoring, an enhanced CDM Strategy and Programme Framework for the five-year period spanning 2007–2012 was elaborated to facilitate a more results-based management approach to loss reduction.

The enhanced framework, which proposes four priority outcomes, as shown in Box 1.3, is based on three underpinning pillars[26]: the review and assessment of the 2001 CDM Strategy and Programme Framework; the global and regional disaster management agenda, including the HFA; and the CARICOM Regional Programming Framework. Outcomes 3 and 4, which prioritize the mainstreaming of DRM into key economic sectors and enhancing of community resilience within member countries, provide the basis for development of a DRM plan for the agriculture subsector.

26 *Comprehensive Disaster Management Strategy and Programme Framework 2007–2012.*

Box 1.3: Priority outcomes for enhanced CDM Strategy and Programme Framework

Outcome 1: Enhanced institutional support for CDM programme implementation at national and regional levels.

Outcome 2: An effective mechanism and programme for management of CDM knowledge has been established.

Outcome 3: DRM has been mainstreamed at national levels and incorporated into key sectors of national economies (including tourism, health, agriculture and nutrition).

Outcome 4: Enhanced community resilience in CDERA states/territories to mitigate and respond to the adverse effects of climate change and disasters.

1.2.4 The Jagdeo Initiative

The Jagdeo Initiative identifies and defines critical and binding constraints to agricultural repositioning in the Caribbean, and aims to develop and implement targeted and practical interventions at both the regional and national levels to overcome the constraints. Between 2004 and January 2005, national and regional consultations were held by the Inter-American Institute for Cooperation on Agriculture (IICA) to further elaborate the constraints to the sector. Ten key binding constraints and interventions were identified, two of which are directly related to the development of agriculture DRM (ADRM) plans, as listed below:

- inefficient land and water distribution and management systems; and
- deficient and uncoordinated risk management measures, including praedial larceny.

1.2.5 DRM framework and implications for sectoral plan development and implementation

The DRM paradigm promotes aggressive and proactive risk reduction, effective preparedness, response and post-disaster recovery and rehabilitation within the context of management principles and practices.[27] The associated framework conceptually differentiates the different phases of the DRM cycle, and therefore represents a strategic planning tool for building resilience at every stage in the cyclical process.

The framework is generally consistent with the international and regional disaster management agenda discussed above, which purports the following key principles and best practices:

27 *Baas, S., S. Ramasamy, J.D. DePryck, and F. Battista, 2008. Disaster risk management systems analysis – A guide book. Number 13 Environment and Natural Resources Management Series.*

1) CDM must be cognizant of all stages in the DRM cycle and should pursue the adoption of a multihazard approach to disaster management. Mainstreaming disaster risk considerations into the planning framework and throughout all stages of the disaster management cycle is imperative. The establishment of capable institutions with clear directives, responsibilities and coordinating protocol to operationalize the DRM framework must be central to the planning framework. Strong institutions are considered the pivot of successful DRM in the Caribbean.[28] Without institutions, there would be no action and DRM would remain a concept on paper.[29] Baas *et al.* emphasize that both DRR and DRM systems are contingent on sound institutional capacities by key actors at different levels of government, the private sector and civil society, as well as effective coordination between these actors and levels.[30] Ongoing analysis of the institutional arrangements is therefore critical if the desired outcomes are to be achieved (see Box 1.4[31] for a summary of key entry points to assess DRM-supported institutional platforms).

Box 1.4: Entry points to evaluate institutional capacity and coordination within a DRM framework

1. What institutional structures, mechanisms and processes are driving national DRM programmes in the agriculture, forestry and fisheries sectors?
2. What technical capacities, tools, methods and approaches are available within existing institutional structures to operationalize DRM at the national and local levels?
3. What existing good practices (either indigenous or scientific) are actually applied at the local level to strengthen community resilience against climatic and other natural hazards, and what are the potential technology gaps (including access to technologies) at the local level?

2) Empowerment of communities at the local level is necessary to ensure effectiveness and efficiency of the DRM framework.

3) Recognition and integration of the following cross-cutting themes in disaster management planning and implementation are critical to the success and sustainability of DRM programming at the national level: adaptation to climate change and variability, gender sensitivity, cultural diversity and peculiarities, and vulnerable populations.

28 *CDERA. No date. CDM – Strategy and programme framework 2007–2012.*

29 *Baas, S., S. Ramasamy, J.D. DePryck, and F. Battista, 2008. Disaster risk management systems analysis – A guide book. Number 13 Environment and Natural Resources Management Series.*

30 *Ibid.*

31 *Ibid.*

1.3 ASSIGNMENT OBJECTIVES

In 2000, FAO (in collaboration with CDERA) provided assistance through a regional project[32] to the Governments of Barbados, Trinidad and Tobago and the Organization of Eastern Caribbean States (OECS) to identify needs and improve planning frameworks for enhanced DRR in the agriculture, forestry and fisheries sectors. The project produced a number of important outputs, including documentation of good practices for DRR and development of a framework DRM plan for the sectors. As a result of that project, some countries successfully drafted DRM plans which outlined procedures to reduce disaster risks and empower the Ministries of Agriculture (MoAs) to effectively respond to and recover from disasters. However, in a number of countries, the plans have not been prepared and in other cases are not comprehensive. For instance, some sectoral plans do not cover vulnerability and damage assessments or are not widely distributed within and outside the MoAs to key stakeholders. Consequently, implementation of these plans is very weak.

In an effort to augment capacities for disaster management in the agriculture sector, FAO commissioned a study in September 2011 to review the status of development and implementation of DRM plans for the sector throughout the Caribbean. Specifically, the assignment was designed to achieve the following objectives:

- determine the availability of DRM plans for droughts, hurricanes, and floods in the agriculture sector throughout 20 Caribbean countries, namely: Anguilla, Antigua and Barbuda, the Bahamas, Barbados, Belize, British Virgin Islands, Cuba, Dominica, the Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago and Turks and Caicos (refer to Figure 1.1); and

- review existing plans to identify best practices, shortcomings and areas where development agencies may assist countries to complete and implement these plans.

The results of the study will be presented at a writeshop formulated to strengthen member countries' capacities to develop and implement comprehensive DRM plans for the sector.

32 *Titled "Emergency Assistance for the Formulation of Hurricane Disaster Preparedness and Impact Mitigation Plans."*

Figure 1.1: Map showing general location of the countries targeted for study

source: [33]

1.4 METHODOLOGICAL APPROACH

Working in collaboration with the FAO Representative in Guyana, a research instrument was developed to collect data consistent with the study's objectives (refer to Appendix 1 for a copy of research instruments). Prior to the commencement of the study, the FAO Representative forwarded a correspondence to Permanent Secretaries in the MoAs in each targeted country, copied to the FAO Regional Representatives. The correspondence summarized the study's objectives and requested cooperation in effective implementation of the assignment. Utilizing e-mail technology and numerous telephone calls, senior agriculture officials were contacted to complete the questionnaire. Numerous follow-up e-mails and telephone conversations were used to clarify issues and request additional information. The results of the study were limited to some extent by lack of face-to-face communication and the difficulty in securing timely completed questionnaires from some countries.

33 *Accessed on 10 December 2011 at: http://www.infoplease.com/atlas/caribbean.html.*

1.5 REPORT STRUCTURE

This report is organized into four sections:

Section 1 provided a background to the study with specific emphasis on the impacts of disasters on the regional agriculture sector, conceptual frameworks informing DRM plans, research objectives and methodology.

Section 2 presents the results of the status of development and implementation of DRM plans for the agriculture sector in the targeted 20 Caribbean countries.

Section 3 summarizes the outcome of a review of existing DRM plans based on approved international and regional conceptual frameworks with particular focus on comprehensiveness, best practices and shortcomings.

Section 4 presents an analysis of the study, and culminates with priority recommendations for facilitating timely completion and sustainable implementation of the ADRM plans within the region.

Pineapple field in destroyed by mud and sand in the wake of flooding caused by Hurricane Mitch.

STATUS OF DRM PLANS IN THE AGRICULTURE SECTOR: A CARIBBEAN PERSPECTIVE

Workmen rebuilding and improving an irrigation system damaged in the last hurricane in an effort to prevent future flooding and minimize damage during the rainy season.

2.1 PARTICIPATION RATE

Data were collected from 19 countries (95 percent) out of the 20 who were invited to participate in the study. Table 2.1 summarizes country participation in the research endeavour.

Table 2.1: Participation of target countries

List of target countries	Status of participation
Antigua and Barbuda	+
Barbados	+
Dominica	+
Grenada	+
Saint Kitts and Nevis	+
Saint Lucia	+
Saint Vincent and the Grenadines	+
Trinidad and Tobago	+
Suriname	+
Guyana	+
Jamaica	+
Bahamas	+
Belize	+
Anguilla	+
British Virgin Islands	+
Montserrat	+
Turks and Caicos	+
Haiti	+
Cuba	x
Dominican Republic	+

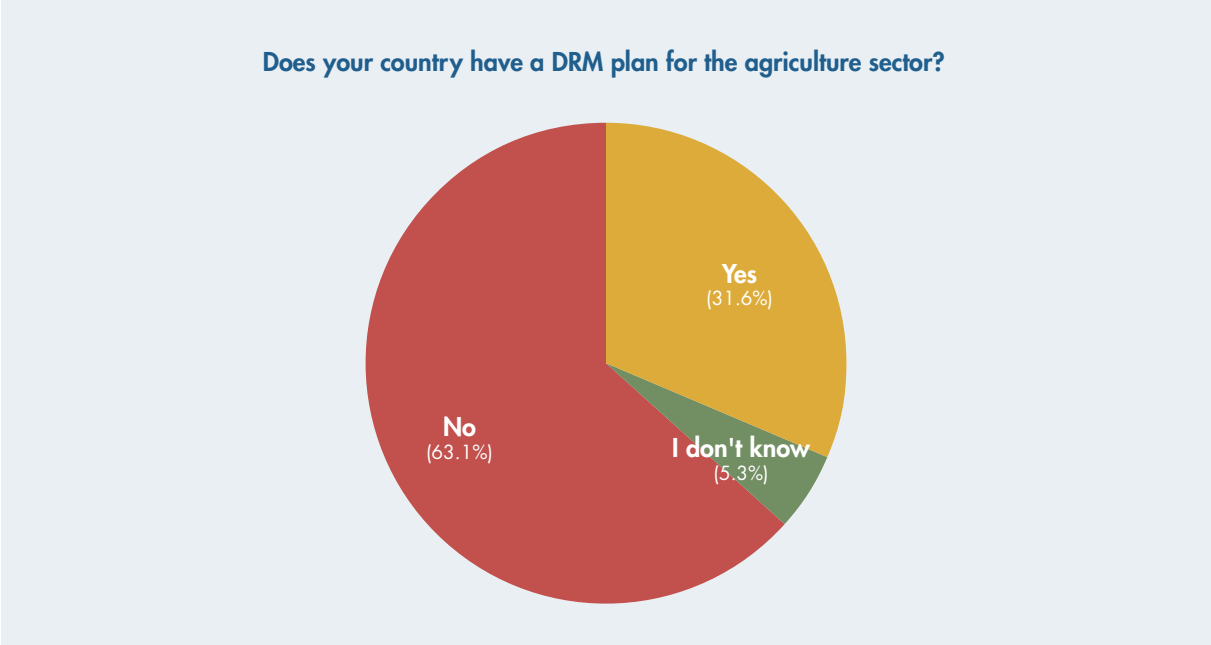
Key: + Participated in study; x did not participate in study

2.2 DEVELOPMENT AND IMPLEMENTATION OF DRM PLANS

2.2.1 Availability of DRM plans for the agriculture sector

The majority of participating countries reported the absence of a DRM plan for the agriculture sector (12 countries, or 63.1 percent), as shown in Figure 2.1. Only six countries reported having a DRM plan in place to manage selected hazards (31.6 percent). These countries were: Belize; the Dominican Republic; Grenada; Jamaica; Saint Lucia[34]; and Saint Vincent and the Grenadines. Saint Vincent and the Grenadines further stated that although most divisions within the MoA are equipped with DRM plans, there is an urgent need to consolidate all documents into one comprehensive plan. Moreover, Antigua and Barbuda (5.3 percent) stated that they were unaware of the presence or absence of a national plan for the sector.

Figure 2.1: Availability of DRM plans for the agriculture sector in Caribbean countries



All countries reporting a DRM plan for the agriculture sector (six countries in total) indicated that it is in draft form. The following summarizes the status of approval in each of the above five countries.

- Although Saint Vincent and the Grenadines was the first country to develop the requisite plan in 2005, Jamaica (followed by Belize) appeared to be more advanced with respect to formalizing the document.

34 *Interestingly, the official reporting for Saint Lucia was unaware that a DRM plan for the agriculture sector had been developed by the Ministry of Agriculture, Lands, Forestry and Fisheries (MALFF) with technical and financial support from FAO. Information about the availability of an ADRM plan was obtained from FAO, illustrating a major communication gap within MALFF in Saint Lucia.*

- Jamaica indicated that the country's DRM plan for the sector, developed in 2009, was accepted by the Ministry of Agriculture and Fisheries (MoAF), although not yet submitted to the Cabinet for official approval.
- Similarly, Belize submitted its draft DRM plan, developed in 2011, to the MoAF for approval with the goal of securing full endorsement by that Ministry by the end of 2011. Confirmation of approval was not determined during the preparation of this document.
- Developed in 2011, the DRM plan for the Dominican Republic is pending formal adoption by the MoA.
- Grenada's plan was forwarded to the Cabinet through the Permanent Secretary, Ministry of Agriculture, Forestry and Fisheries during 2009. However, the plan has not yet been sent to the final government decision-making body. Similarly, the draft document was submitted to the National Disaster Management Agency (NaDMA) in the same year to ensure synergy and inclusion in the national disaster management plan. No comments were received from the Agency to date (refer to Table 2.2 for a summary of plan development).
- Saint Lucia's plan, developed in 2011, is awaiting formal approval by MALFF. Importantly, the recent election and change of government in November 2011 was not catalytic for securing formal approval by the related Ministry and/or Cabinet.

Table 2.2: Summary of DRM plan development

Name of country	Year of plan development	Status of draft plan
Saint Vincent and the Grenadines	2005	Not yet approved by the MoA
Jamaica	2009	Approved by the MoAF. Not yet submitted to Cabinet
Grenada	2009	Submitted to Cabinet through the Ministry of Agriculture, Forestry and Fisheries and the NaDMA. Not yet approved by either agency.
Belize	2011	Submitted to the MoAF; expecting approval at the end of 2011.
Dominican Republic	2011	Submitted to the MoA for approval.
Saint Lucia	2011	Submitted to Cabinet for approval.

2.2.2 Methodology used to develop DRM plans

2.2.2.1 Consultant support

Four of the six countries that developed the target output – namely Belize, the Dominican Republic, Jamaica and Saint Lucia – reported using a consultant to develop the sectoral DRM plan (66.7 percent). In the case of Jamaica, the resultant plan was developed by the recruited consultant in conjunction with personnel from the MoAF and the Rural Agricultural Development Authority (RADA).[35] Similarly, the national consultant collaborated closely with the MALFF in Saint Lucia during the plan's development.

Two countries (33.3 percent) – Grenada and Saint Vincent and the Grenadines – indicated that a consultant was not employed to develop the plan. Rather, a committee was convened to complete the document in each case. In the Grenadian situation, the World Bank provided technical assistance to develop a disaster management policy on request from the Ministry of Agriculture, Forestry and Fisheries. The draft plan was subsequently developed by a ministerial Disaster Management Committee comprising all heads of department. Using a similar approach, Saint Vincent and the Grenadines utilized a multisectoral committee comprising private sector companies, civil society organizations and sectoral government representatives to constitute the plan. The National Emergency Management Organisation (NEMO) within that State coordinated the activity.

2.2.2.2 Stakeholder involvement

As shown in Table 2.3, countries utilized participatory principles to develop the draft plan, with some variation. In each country, a multisectoral stakeholder group was consulted to develop the DRM plan, with the exception of Grenada, which adopted this approach during the development of its DRM policy for the agriculture sector.

35 *RADA is a statutory body under the MoAF established by the Rural Agricultural Development Authority Act of 1990, replacing the Lands Authorities Act and began its operation on 1 August 1990. It is Jamaica's chief agricultural extension and rural development agency, as quoted from RADA's website http://www.rada.gov.jm/about_rada.php, accessed on 7 January 2012.*

Table 2.3: Stakeholder engagement approach in DRM plan development

Countries	Participatory approach adopted during plan development	Number of times stakeholders consulted
Jamaica	• Consulted with the ADRM Committee and a diverse multisectoral stakeholder group including farmers; fisherfolk; RADA and MoAF divisional officials; College of Agriculture, Science and Education; Jamaica Information and Service (Government media); Caribbean Boilers; agricultural input suppliers; 4 H; ADRM, etc.	• Mulitsectoral stakeholder group – once • ADRM committee - at least twice, before and after plan drafted
Saint Vincent and the Grenadines	• Established an ad hoc committee comprising representatives from various government ministries including the MoA, civil society organizations and private agencies to develop the plan.	• Met numerous times with support from NEMO
Grenada	• Consultation with a multisectoral group including government, private sector agencies, farmers and non-governmental organizations (NGOs) to develop the agriculture disaster management policy • Established an ad hoc ministerial disaster management committee constituted of department heads.	• Once via a workshop facilitated by the World Bank • Met a number of times
Belize	• Consulted with a diverse sectoral audience inclusive of state (e.g. MoAF, Ministry of Environment, and Ministry of Economic Development) and non-state actors (IICA, the Caribbean Agricultural Research and Development Institute [CARDI], the Red Cross, farmers, agroprocessors, banana growers association, academia and NGOs)	• Five major country-wide meetings
Dominican Republic	• Secured the views of a multisectoral group including the risk management sector, technical officers from the MoA, and Civil Defense and Emergency Committees	• Once via a workshop organized by FAO and the MoA
Saint Lucia	• Consulted with representatives of the MALFF, NaDMA, and the OECS Secretariat to develop a draft plan. • Conducted review meetings to discuss and validate the draft plan; engaged MALFF, FAO technical officials, NaDMA and the OECS Secretariat.	• Once via a stakeholder workshop • Met a number of times

2.2.2.3 Type of technical studies used in plan development

Figure 2.2 outlines the principal technical studies used during plan development as reported by technical officers. The HFA provided the overarching framework for the processes in Jamaica and Belize. The Poverty Elimination Plan, a principal macroeconomic policy, informed development of the Belize plan. Select vulnerability, damage and loss, and damage and needs assessments informed the Belizean process, and to a lesser extent the plans of Grenada and the Dominican Republic. In addition, national agricultural statistics provided the baseline for the outputs of Belize and the Dominican Republic.

Figure 2.2: Technical studies used in DRM plan development as reported by technical officers

Jamaica	•HFA 2005-2015 •International Strategy for Disaster Reduction •National Disaster Management Plan •National Hazard Mitigation Policy
St Vincent & The Grenadines	•Information not provided
Grenada	•Damage and loss assessments and socio-economic assessments of Hurricanes Ivan (2004) and Emily (2005) •Assessment of the Grenada drought and bush fire 2009-2010 •National Disaster Management Plan
Dominican Republic	•Statistical data from MoA showing key sector indicators •Economic evaluation of damage and loss assessments of previous hazards
Belize	•Country profile information •Vulnerability and adaptation assessment of fisheries and aquaculture industries to climate change •National Food and Agriculture Policy •National Poverty Assessment (2010) and National Poverty Elimination Action Plan (2007-2011) •Belize National Hazard Mitigation Plan •Belize Climate Change vulnerability and adaptation assessment for sugarcane, citrus (Belize Second National Communication project) 2008

2.2.2.4 Source of funding

As shown by Table 2.4, donor agencies particularly FAO and the Spanish Agency for International Cooperation for Development (AECID) provided funding to countries that employed consultants to develop the DRM plans. In contrast, non-consultant driven projects used in-kind government assistance to achieve the desired output. Figure 2.3 presents a summary of the methodology adopted by member countries to develop their DRM plan for the agriculture sector.

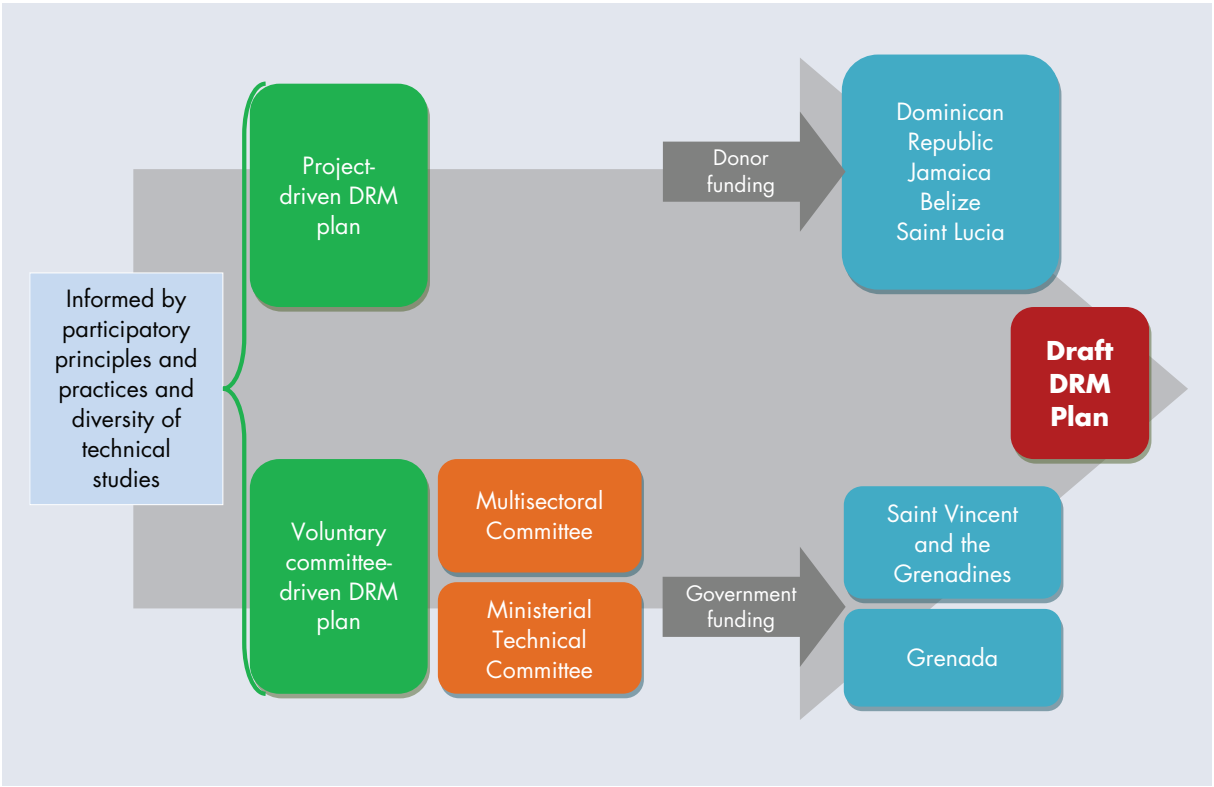
Table 2.4: Source of funding for DRM plan development

Name of country	Source of funding	Expenditure/USD
Jamaica	FAO	USD 92 293.00
Saint Vincent and the Grenadines	Government of Saint Vincent and the Grenadines	In-kind contribution
Grenada	Government of Grenada	In-kind contribution
Belize	FAO through the Technical Cooperation Programme "Improved national and local capacities for hurricane-related disaster mitigation, preparedness and response in the agriculture sector 2008–2011"	-
Dominican Republic	AECID* and FAO Government of the Dominican Republic has allocated funds for plan implementation in 2012	Amount of funds not known by country official** 50 million pesos (US$)
Saint Lucia	MALFF and FAO Technical Cooperation Programme "Disaster Risk Mitigation in Agriculture, Forestry, Fisheries"	60,00.00

* *AECID is the official Spanish agency for international development cooperation and for humanitarian assistance, responsible for the coordination of the whole Spanish humanitarian aid as quoted from http://www.actionagainsthunger.org/taxonomy/partners/institutional/aecid-spanish-agency-international-cooperation-and-development; accessed on 7 January 2012.*

** *Known by FAO Regional Office – was not determined during preparation of document.*

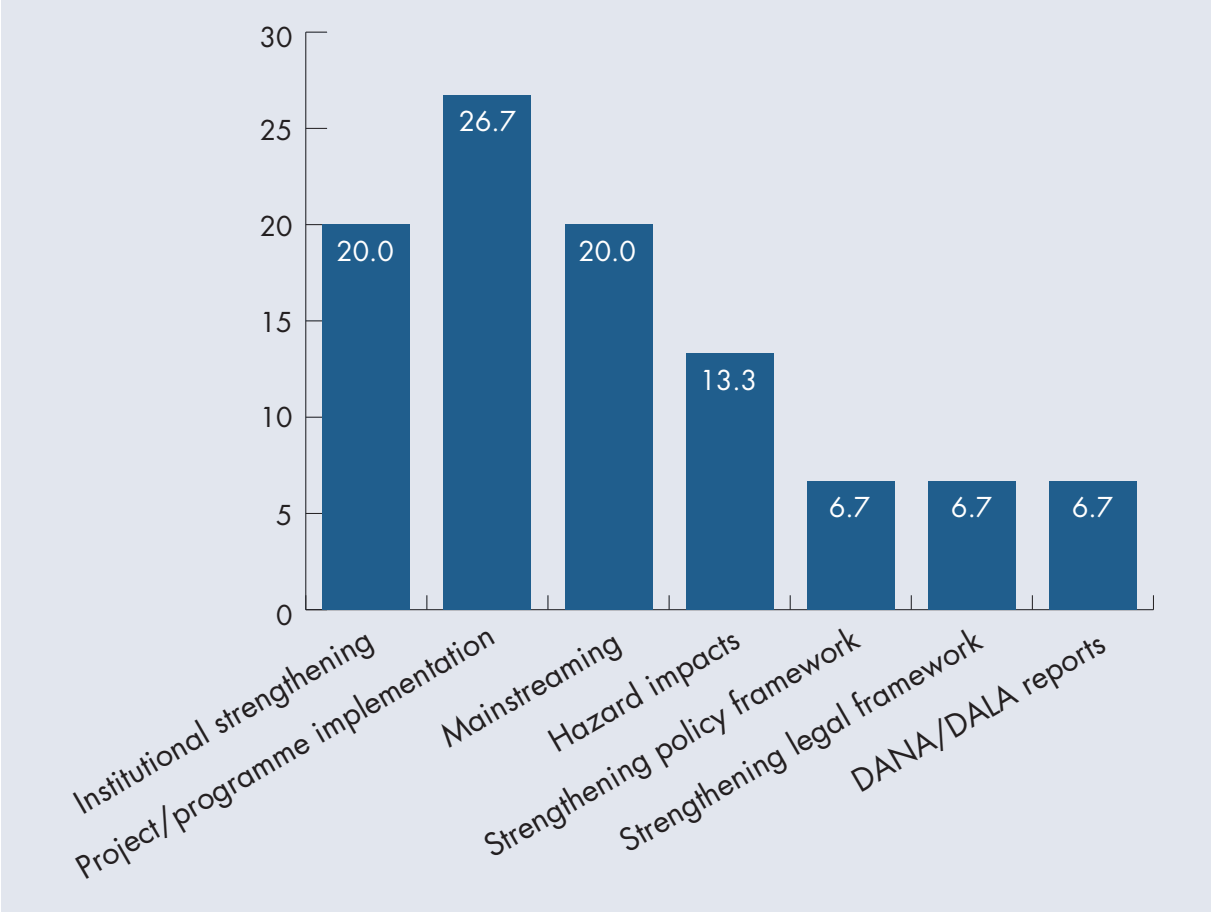
Figure 2.3: Illustrative summary showing process used to develop DRM plans



2.2.2.5 Relevant initiatives that contributed to DRM plan development

As illustrated by Figure 2.4, a range of systemic, institutional and programmatic interventions influenced development of country DRM plans.

Figure 2.4: Summary interventions contributing to country DRM plan development



Implementation of projects and/or programmes represented the most common contributing factor to plan development (n=4, 26.7 percent), followed by institutional strengthening and mainstreaming (n=3, 20 percent). Knowledge of the destructive impacts of recent hazards was deemed important by two countries (13.3 percent). Other contributing factors included strengthening policy and legislative frameworks and the review of damage and loss/needs assessment (DALA/DANA) reports (n=1, 6.7 percent). Refer to Table 2.5 for a comprehensive presentation of related interventions.

Table 2.5: Initiatives, projects, and programmes that contributed to DRM plan development

Country	Contributing initiatives, projects and programmes
Grenada	**Institutional strengthening and mainstreaming** •MoA's participation in the National Disaster Executive Advisory Council, NaDMA. The Advisory Council is the leading authority on DRR at the national level. Headed by the Prime Minister, the Council's principal role is to develop appropriate policies that ensure effective implementation of the national disaster plan. **Hazard impacts** •Hurricanes Ivan and Emily, in 2004 and 2005, respectively.
Dominican Republic	**Institutional strengthening** •Creation of the Department of Risk Management and Climate Change by Resolution No. 34-2011 in the MoA designed to achieve the following objectives: –incorporate, in a sustainable manner, the actions of the MoA to the national system of risk management and climate change in the Dominican Republic; –contribute to the institutional strengthening of the MoA in relation to risk management and climate change; and –provide effective response before, during and after natural disasters, with special emphasis on those that affect the national agrofisheries sector. **Project/programme implementation** •Implementation of two World Bank-funded projects (a) supporting small producers in consumption and technologies and (b) agricultural insurance
Belize	**Mainstreaming** •Government efforts to mainstream climate change and DRM into national development plans. **Hazard impacts** •Hurricanes Dean (2007) and other tropical systems with devastating impacts on rural communities and farmers. **Project/programme implementation** •MoAF initiatives to build resilience among rural communities.
Saint Vincent and the Grenadines	**Strengthening legislative frameworks** •Passage of the National Emergency and Disaster Management Act 2006, which addresses issues relating to the functioning of NEMO and disaster management generally. **Project/programme implementation** •Implementation of the Regional Disaster Vulnerability and Climate Risk Reduction Project, funded by the World Bank and Climate Investment Fund, in 2011.
Saint Lucia	•Framework for the Caribbean 2009-2015 climate change. •National Emergency Management Plan (NEMP). •Disaster Management Act 2006. •National Hazard Mitigation Plan.

Country	Contributing initiatives, projects and programmes
Jamaica	**Institutional strengthening and mainstreaming** •Commissioning of the national ADRM Coordinating Committee; and parish ADRM committees; and •development of parish preparedness plans. **Project/programme implementation** •Implementation of the National School Garden Programme – Government of Jamaica, Jamaica food security programme; •implementation of the following RADA projects and programmes: land husbandry and crop care; natural disaster agricultural damage assessments; parish ADRM subsector parish profiles; and crop and livestock production statistics; •implementation of the Government of Jamaica Building Disaster Resilient Communities and Fruit Tree Crop projects; •final report emanating from the FAO-funded project (2007): "Assistance to improve local agricultural preparedness in Caribbean countries highly prone to hydrometeorological hazards"; and •FAO/International Labour Organization (2009) final report: "The Livelihoods Assessment Toolkit: Analysing and Responding to the Impact of Disasters on the Livelihoods of People". **Strengthening policy framework** •Completion of the national disaster management plan; •establishment of the Office of Disaster Preparedness and Emergency Management (ODPEM); and •completion of the MoAF Plant Health Policy and Emergency Animal Disease Preparedness Plan. **Damage and loss/needs assessment reports** •ECLAC-United Nations Development Programme (2004) "Assessment of the socio-economic and environmental impact of Hurricane Ivan on Jamaica"; and •ECLAC-Caribbean Development and Cooperation Committee (2001) "Assessment of the damage caused by flood rains and landslides in association with Hurricane Michelle".

2.2.3 Best practices in DRM plan development

Countries were asked to identify best practices used in development of DRM plans. Box 2.1 summarizes the results of this inquiry.

Box 2.1: Reporting officers' perception of best practices used in development of ADRM plans

- Assignment of a technical officer with sole responsibility for DRM in the MoA (Grenada);
- inclusion of the MoA technical heads of department as the lead committee to develop the DRM plan (Grenada);
- extensive primary research and use of secondary literature (Belize);
- extensive consultation with multistakeholder groups (Belize);
- adopted steps to ensure that the DRM plan was in harmony with international protocols and agreements, for example the HFA (Belize); and
- integrated best practices emanating from implementation of pilot projects in strategic locations for hazard reduction in DRM plan (Belize).

2.2.4 Challenges in plan development

Four of the six countries with draft DRM plans (66.7 percent) – Belize, the Dominican Republic, Grenada and Jamaica – indicated that their country experienced challenges in the development of the ADRM plan. Saint Vincent and the Grenadines and Saint Lucia gave no indication of the presence or absence of challenges during the development process. As shown by Table 2.6, financial constraints and inadequate knowledge management (n=2, 28.6 percent) represented the most common challenges reported by countries, followed by inadequate capacity to conduct vulnerability assessments, inadequate administrative support and stakeholder participation (n=1, 14.3 percent).

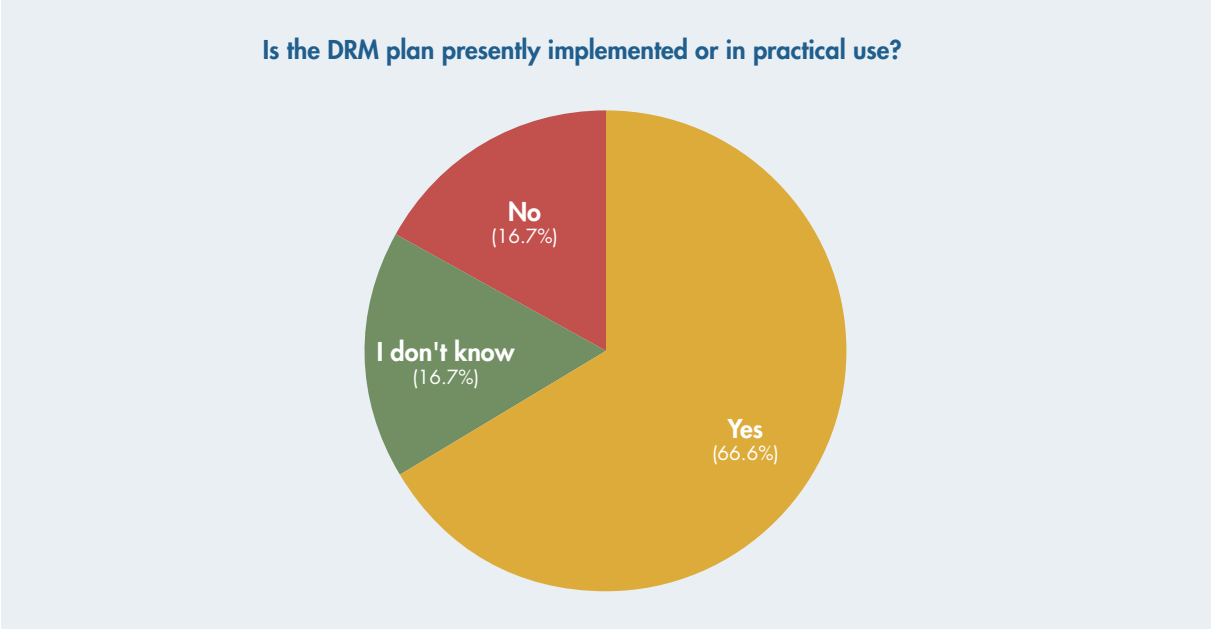
Table 2.6: Challenges experienced by Caribbean countries during the development of ADRM plans

Country	Contributing initiatives, projects and programmes
Dominican Republic	**Inadequate capacity to conduct vulnerability assessment** •High number of vulnerable areas throughout the Republic. **Financial constraints** •Limited economic resources.
Grenada	**Inadequate administrative support** •Inadequate support at the highest administrative level in the Ministry with responsibility for agriculture during development of plan. **Financial constraints** •Lack of a budget to develop plan.
Belize	**Inadequate stakeholder participation** •Securing optimal stakeholder representation and participation during consultations. **Inadequate knowledge management** •Obtaining reliable and relevant local and national data and information to inform plan development.
Jamaica	**Inadequate knowledge management** •Insufficient historical data on damage and loss assessments.
Saint Vincent and the Grenadines & Saint Lucia	Not stated

2.2.5 Status of implementation of ADRM plans

Country officials who reported development of an ADRM plan were asked whether or not the plan was presently implemented or in practical use. Four of the six countries with ADRM plans indicated current implementation (66.6 percent), including the Dominican Republic, Jamaica, Belize and Saint Vincent and the Grenadines. Grenada reported been unsure whether implementation is presently occurring (16.7 percent), while Saint Lucia (16.7 percent) noted that implementation has not yet commenced, since the plan is awaiting formal endorsement (see Figure 2.5).

Figure 2.5: Percent implementation among countries with DRM plans



Five of the six countries with ADRM plans reported only preliminary implementation, as shown by Box 2.2. Some initial efforts at establishing institutional and coordinating mechanisms were executed by Belize, the Dominican Republic and Grenada. In addition, Jamaica and Grenada indicated action to strengthen public awareness of disaster preparedness among key stakeholders.

Box 2.2: Extent of implementation of ADRM within the Caribbean

Country	Implementation actions
Dominican Republic	•Created the regional committee and unit of fast answer; and •disseminated DRM plan to regional directors in regions with the greatest vulnerability.
Grenada	•Establishment of parish agriculture disaster management coordinators and committees; •preparation of terms of reference for parish committees and preparation of reporting system; •conducted an inventory of MoA assets, and established contact database for the MoA; and •developed and commenced implementation of a public relations campaign on disaster preparedness.
Belize	•Established DRR committee and recruited a DRR coordinator within the MoAF.
Jamaica	•Sensitization of farmers on disaster preparedness and best practices for risk reduction by DRM trained officials.
Saint Vincent and the Grenadines	•At time of study not yet applicable.

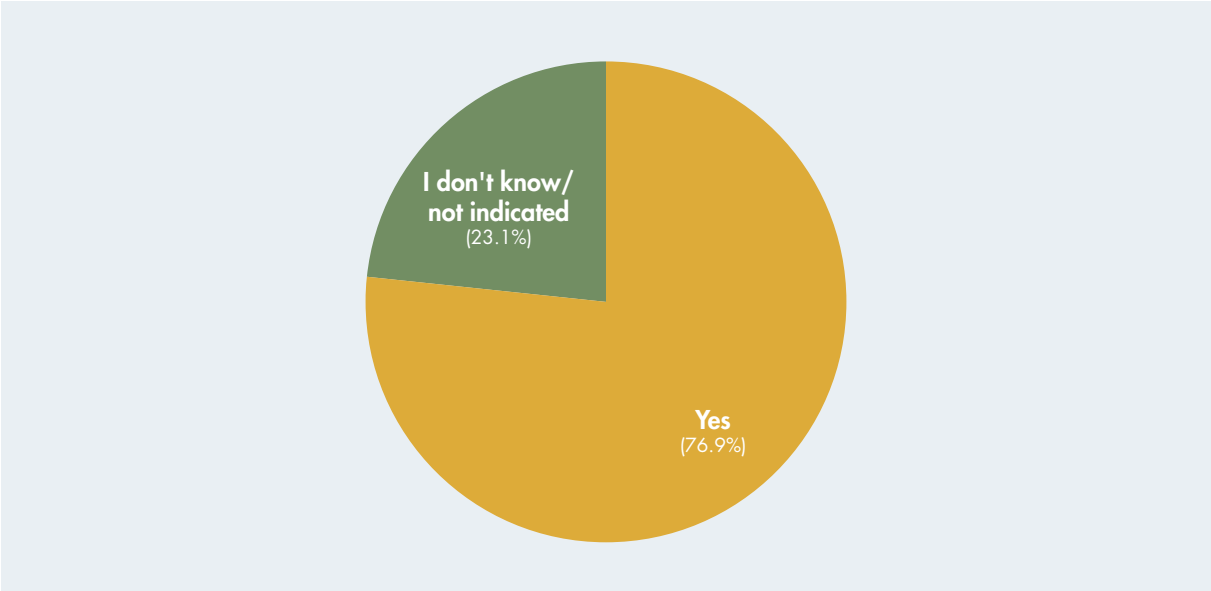
Grenada noted, however, that actions have halted due to the lack of a champion and designated personnel to support plan execution.[36] Therefore, all institutional structures established (i.e. the ministerial disaster management and parish committees) are currently non-functional. Jamaica identified resource constraints as a contributing factor to low implementation. In the case of Belize, implementation is only in its initial stages due to the fact that the plan has not yet been formally approved.

2.2.6 Future development of DRM plans

2.2.6.1 Intention to prepare DRM plan

Countries reporting not having in place an ADRM plan (a total of 13 countries) were asked whether they intended to prepare the target output. As shown by Figure 2.6, the majority of countries reported having some intention to develop the sectoral plan (10 countries, or 76.9 percent). However, three countries (23.1 percent) noted that they were unaware or did not indicate their country's preference to develop the plan (see Table 2.7 for details on member countries' future thinking regarding DRM plans).

Figure 2.6: Countries' perception of development of DRM plans in the future



2.2.6.2 Proposed timeline

Of the countries that reported intention to develop an ADRM plan (a total of ten countries), three stated a specific time period of interest to undertake the assignment (30 percent). Guyana anticipated commencement at the end of 2011,[37] while Haiti and the Bahamas preferred 2012. The majority of countries, however, did not establish a timeline to commence the activity (seven out of the ten countries, or 70 percent) as illustrated in Table 2.7.

36 *The Disaster Management Coordinator that spearheaded the development of the disaster management policy and plan was reassigned to another project in 2010.*

37 *Unsure if this activity commenced.*

Table 2.7: Country plans to develop ADRM plan

Country	Plans to develop ADRM plan	Target year	Comments
Bahamas	Yes	2012	• Pending availability of technical and financial resources. • "I was under the impression that FAO had a project to assist with DRM for the agrisector" [Chief Economist, Ministry of Agriculture and Marine Resources, the Bahamas].
Anguilla	Yes	Timeline not determined	• Preliminary discussion to develop plan undertaken.
Montserrat	Yes	Timeline not determined	• Very preliminary discussion between the Director of Agriculture and the Disaster Management and Coordinating Agency – no specific details finalized. Funding source not identified. • "I have not discussed the plan with the Minister for Agriculture. Due to the importance of the plan to the sector, I believe that the Minister will support the venture… the Ministry does not have the technical and financial resources necessary to dedicate to development of a DRM plan" [Director of Agriculture, Ministry of Agriculture, Land, Housing and the Environment, Montserrat].
Saint Kitts and Nevis	Yes	Timeline not determined	• Currently reviewing five-year draft strategy for agriculture – synergistic activity. • "Interested in participating in any regional initiatives to develop ADRM plan" [Policy Analyst, MoA, Saint Kitts & Nevis].
Haiti	Yes	2012	• No comments
Turks and Caicos	Unknown	N/A	• Presently awaiting national legislation to establish a MoA. • "We need help first to develop the agriculture sector before we can consider a DRM plan …do not know what a DRM plan looks like … agriculture is primarily subsistence, very few farmers in country. At this stage we are not really aware of the relevant of the DRM plan for the agriculture sector" [Director of Agriculture, Ministry of Environment, Turks and Caicos].
Antigua and Barbuda	Unknown	N/A	• No comments
Guyana	Yes	End of 2011	• Development of the Guyana DRM Plan for the agriculture sector commenced in August 2012 with plans to complete in early 2013.

Country	Plans to develop ADRM plan	Target year	Comments
British Virgin Islands	Yes	Timeline not determine	• Commenced development of DRM plan, however, process halted due to inadequate capacity to undertake activity. • "The MoA was given a template by the Department of Disaster Management to guide development of a DRM plan for the agrisector. I feel there has been a halt on it because we are not able to properly complete the necessary information being asked on it" [Deputy Chief Agriculture Officer, Department of Agriculture, British Virgin Islands].
Trinidad and Tobago	Yes	Timeline not determined	• "In the near future" [Planning Officer 11, Ministry of Food Production, Land and Marine Affairs, Trinidad and Tobago] .
Dominica	Yes	Timeline not determined	• Preliminary first draft prepared as a component of the FAO-funded project "Assistance to improve DRM capacities in agriculture sectors carded to culminate in December 2011". • "Much more work and consultation is required on this draft, which it is hoped, can be accommodated in a Phase 11 project, subject to FAO approval" [Technical Officer, MoA, Dominica].
Suriname	Not stated	N/A	• N/A
Barbados	Yes	Not indicated	• Pending development of technical capacity. • "As soon as requisite information and skills are available" [Ralph Farnun, Acting Chief Agriculture Officer, Agriculture, Food, Fisheries and water Resource Management, Barbados].

2.2.6.3 Needs in DRM plan development

Countries were asked to identify specific areas where development agencies may assist in the development of DRM plans for the agrisector. Table 2.8 summarizes countries' views.

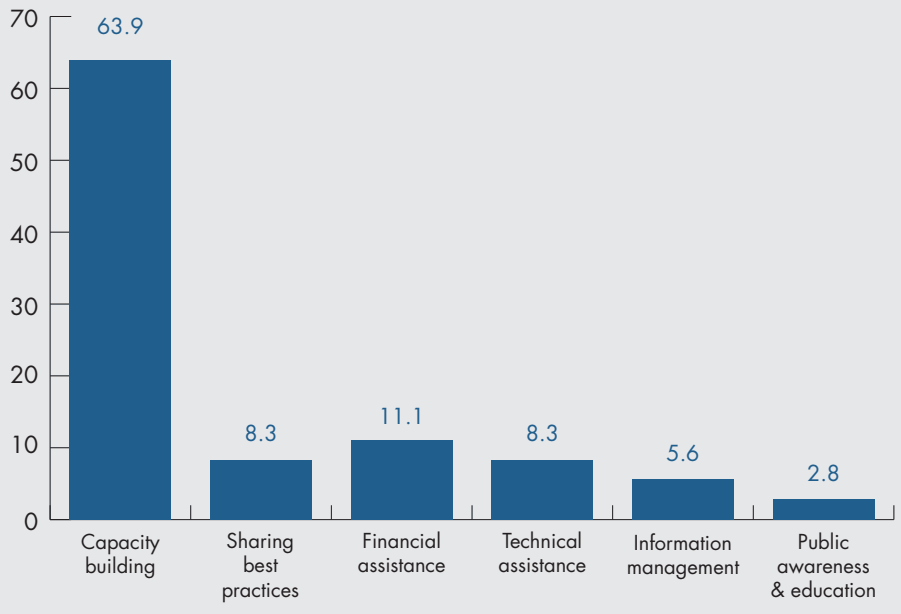
Table 2.8: Summary of countries' perception of needs in development of ADRM plan

Country	Identified needs
Bahamas	**Capacity building** •Formalization and dissemination of disaster preparedness and mitigation procedures for hurricane and drought-related hazards at all levels. **Sharing best practices** •Best practices for mitigating against agrochemical spills. **Financial assistance** •Financing the national crop insurance program.
Anguilla	**Sharing best practices** •Sharing lessons learnt of best practices from countries on methodology and components of a good DRM plan.
Montserrat	**Technical and financial assistance** •Need technical and financial assistance to develop DRM plan; and •identification of consultant and development of terms of reference for assignment.
Saint Kitts and Nevis	**Information management** •Creating map showing all farms within the State. **Public education and awareness** •Providing public education and awareness materials for DRR.
Haiti	**Capacity building** •Hazard and vulnerability assessment and mapping; •development of preparedness plans for the sector and EWS; •mechanism and procedures to develop a DRM unit within the MoA; •relation and linkage between the MoA and other line ministries for DRM; •strategy to implement plan at central and decentralized levels; and •experiences of other Caribbean countries in implementation of the HFA related to the agriculture sector. **Information management** •Data and information sharing at national and regional levels. **Sharing best practices** •Experience of other Caribbean countries in introduction of low cost technologies for DRM in the agrisector.
Turks and Caicos	**Technical and financial assistance** •Assistance to develop the agriculture sector.
Antigua and Barbuda	**Capacity building** •Vulnerability mapping, risk assessment and mitigation; •response and recovery; and •development of EWS for indentified hazards.
Guyana	**Financial assistance and capacity building** •Funding a consultant to develop the DRM plan and in-house training to do the same.

Country	Identified needs
British Virgin Islands	**Capacity building** •Capacity building to DRM plan development.
Trinidad and Tobago	**Capacity building** •Flood prevention and control; •drought mitigation; •recovery from hurricane damage; and •mitigating effects of climate change.
Dominica	**Technical assistance** •Assistance to include DRM interventions for non-meteorological hazards that affect the sector.
Saint Lucia	**Capacity building** •Risk assessment and reduction; •preparedness to include EWS; and •response and rehabilitation.
Suriname	Not stated
Barbados	**Capacity building** •Risk assessment and insurance systems.

Figure 2.7 presents the results of a prioritization of countries' needs to develop ADRM plans. Three of every five countries viewed capacity building as the most important thematic area of assistance (63.9 percent of the countries surveyed), followed by financial assistance (11.1 percent). Other needs included sharing best practices (8.3 percent), technical assistance (8.3 percent), information management (5.6 percent) and public awareness and education (2.8 percent).

Figure 2.7: Summary of the countries' needs for development of ADRM plans by thematic area



Capacity building needs were further analysed to reveal three levels of priority based on the prevalence of reporting by countries. As illustrated in Figure 2.8, capacity building in the areas of risk assessment, disaster preparedness and institutional strengthening were deemed most critical within the region. This was followed by technical training and assistance in the areas of mitigation, response and recovery.

Figure 2.8: Levels of priority of capacity building needs within the Caribbean for development of ADRM plan

REVIEW OF EXISTING DRM PLANS

This section conducts a review of existing draft DRM plans for the agriculture sector within the Caribbean with the object of identifying best practices, shortcomings and needs.

A local farmer resuming household gardening for family consumption after Hurricane Ivan.

3.1 BEST PRACTICES IN PLAN DEVELOPMENT

3.1.1 Dominican Republic

- The risk profile of the agriculture sector in the Dominican Republic was adequately informed by an assessment and mapping of hurricane hazards using historical data for three decades. Information on hurricane-related hazards, impacts on the sector, frequency and subsector components most at risk were presented. Quite notable is the extensive information provided on areas vulnerable to hurricanes to include cropping systems in high risk locations. Geographic vulnerability to floods was included to a lesser extent.

- Reference in the objectives statement that the contingency plan be used as a decision-making tool by all national stakeholders and the United Nations System, is consistent with best practices for ensuring a standardized approach to DRM.

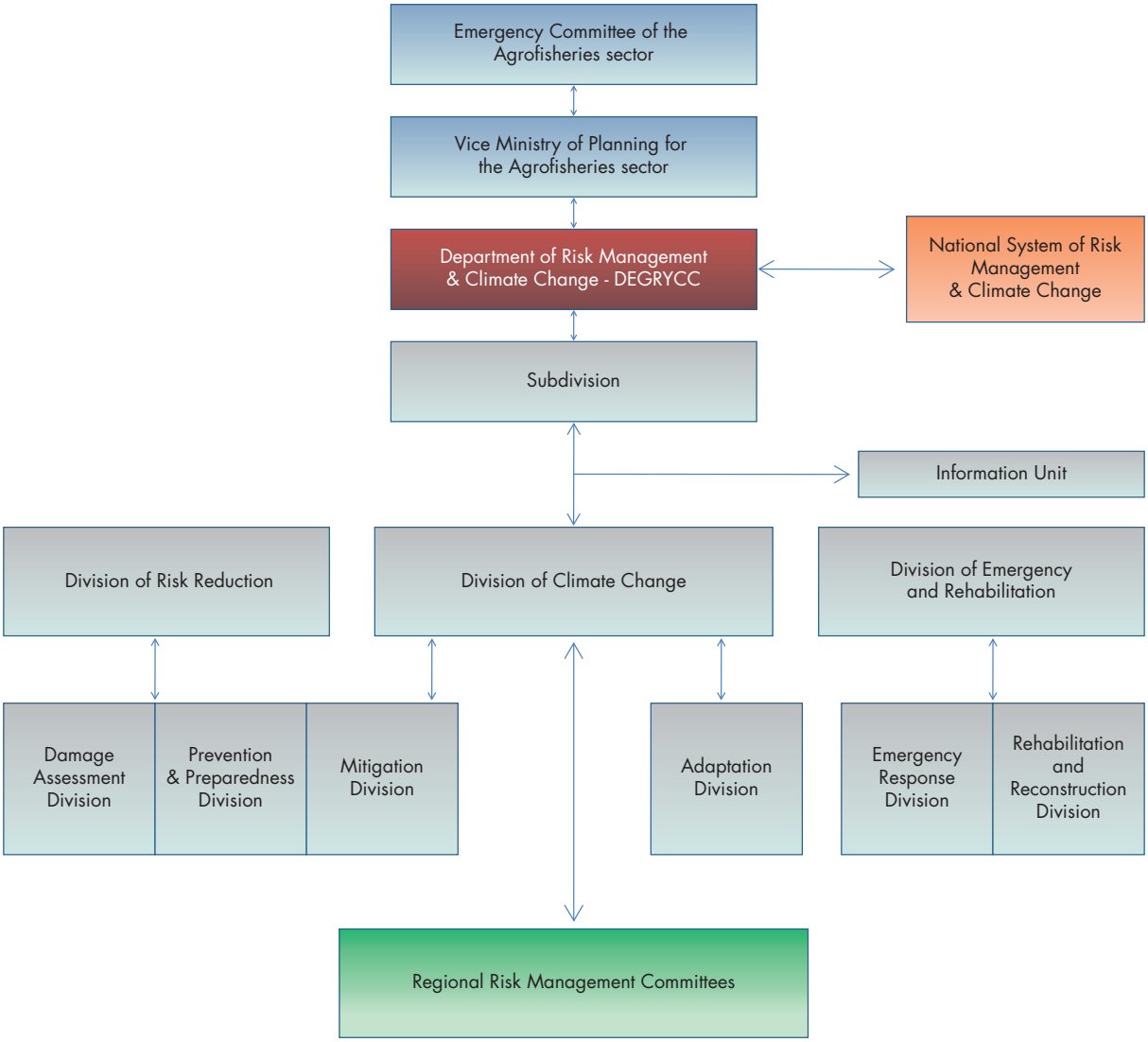
- Presented an analysis of the weaknesses of the EWS and established a network of focal points to disseminate alerts to the agriculture community in vulnerable areas.

- The formal establishment of the Department of Risk Management and Climate Change (DEGRYCC)[38-39] in June 2011 as a functioning entity assigned to the Vice Ministry of Planning, the MoA represents an excellent institutional model for mainstreaming DRM and climate change adaptation (CCA) within the sector. Charged with a coordinating responsibility, the DEGRYCC will incorporate the strategic actions of the MoA in the National System of Risk Management and Climate Change in the Dominican Republic. In addition, the Department will manage all emergency situations affecting the national agriculture and fisheries subsectors. Importantly, as illustrated in Figure 3.1, the three main divisions of the DEGRYCC (Divisions of Risk Reduction, Climate Change and Emergency and Rehabilitation) address all stages of the DRM cycle, including climate change. Its policy decisions and directives are implemented at the ground level through a hierarchical system comprising the regional risk committees and the regional response units. The latter serves as the operative instrument of the DEGRYCC and are responsible for promoting and maintaining coordination among the different operative aspects of production, extension and rural organization to effectively manage emergency situations in the agrofishing sector.

38 *Officially created through resolution No. 34-2011.*

39 *Emanated as a key recommendation from the FAO-funded project TCP/DOM/3105, implemented between February 2008 and January 2009, aimed at strengthening capacities of government institutions as it relates to risk management.*

Figure 3.1: Organizational structure of the DEGRYCC, the Dominican Republic[40]



- Resolution Number 34-2011, which establishes the DEGRYCC, succinctly communicates the seriousness of natural hazards and climate change on the agriculture and fisheries subsectors of the Dominican Republic, and the imperative of DRM and CCA as underpinning pillars in the new economy. Its adoption therefore represents a powerful tool for mainstreaming and advocating DRM and climate change through sectoral programming. Moreover, the Resolution speaks volumes of the political and administrative will and commitment to transforming the development culture.

40 *FAO & AECID. 2011. Contingency Plan for the agriculture and fishing sectors – Hurricane season 2011.*

- Effective and efficient response to hurricane-related hazards is facilitated through a formalized institutional framework called "The structure of rapid response". The organizational structure shows clear lines of communication from the Vice Ministry of Planning, MoA and DEGRYCC to all regional units to allow for quick and urgent action at the farm level.
- The plan also includes a comprehensive inventory of the Ministry's assets and key contact officials.

3.1.2 Grenada

- Articulation of an agriculture disaster management policy by the MoA to provide an overarching framework for DRM is consistent with best practices. The policy, although not comprehensive, is an excellent platform to propel the Government of Grenada's position regarding natural disasters. It can be further strengthened by demonstrating synergies with international and regional disaster management policies and programming, outlining clear principles and values, augmenting the institutional arrangements for DRM particularly at the community and farm level, mainstreaming CCA, and providing clear policy interventions to facilitate sustainable rehabilitation within the sector.
- The proposed institutional structure for DRM activation within the MoA parallels to a large extent the model used at the national level, integrating national, parish/district and community levels.
- DANA was included as a strategic invention in the draft document. In fact, training in DANA represents a strategic intervention for preparedness planning.

3.1.3 Belize

- Distinct synergies were established between the HFA, the national policy and legislative framework governing DRM and the draft national DRM plan.
- Effective mainstreaming of the concepts of DRR and CCA is evident in the draft document.
  - For example, use of the term DRM throughout the plan is significant because it promotes stakeholders' familiarity with the concept. This is a low-level, yet critical, ingredient needed for effective mainstreaming.
  - In communicating the MoAF's current and new roles in DRR, the author noted: "MoAF needs to flag up the importance of mainstreaming DRR and CCA in all other relevant sectors to support and achieve sustainable results.... It is essential that...MoAF systematically incorporates DRR and CCA as an integral component into its own policy planning, as well as flag up the gaps and needs in national documents to ensure country-wide efficient and effective agriculture and fisheries services."
  - Goal 1, designed to establish an effective institutional set-up for DRR and CCA in agriculture and fisheries, is operationalized through three strategies. Strategy 1 seeks to institutionalize DRR and CCA within the MoAF. The specific interventions are promulgated in Box 3.1 below.

Box 3.1: Actions for institutionalizing DRR and CCA within the MoAF, Belize

- Establish a planning and implementation committee of 3–5 members on DRR and CCA in agriculture and fisheries, headed by a senior position of the MoAF, and with representation from fisheries, livestock and cropping subsectors. The committee will develop synergies and maximize resources through dialogues, linkage and networks among the ministry, national and international NGOs and research organizations. The committee will co-opt representatives from the private sector.
- Review and assess the MoAF's policies, sector planning documents and various programmes and activities and integrate or mainstream DRR and CCA aspects into those policy documents and programmes to ensure sustainable impacts.
- Conduct a comprehensive capacity development needs assessment of the MoAF to identify capacity gaps on DRR and CCA; develop a staff capacity building mechanism; and organize classroom and filed based training workshops for all levels of MoAF staff on DRR, including follow-up staff development plans.
- Gradually incorporate DRR and CCA activities into job description of MoAF staff to guide DRR and CCA implementation processes at national, district and local levels.

- In addition, Strategy 2 promotes the mainstreaming of DRR and CCA via strategic partnerships with NEMO, other relevant governments, NGOs, research organizations and the private sector.
- Strategy 3 seeks to empower communities through adoption of an efficient and effective community-based DRR process. This process prioritizes community DRR programming, development of community-based DRR plans, mobilization of financing for plan implementation, and incorporation of community DRR plans into the national ADRM planning framework.
- Box 3.2 documents an excellent model for improving local communities' knowledge and access to climate information and early warning messages tailored to the needs of agriculture resource users. Additionally, it strengthens the plans' capacity to mainstream CCA at the grassroots level.

Box 3.2: Strategy for enhancing EWS of climate information for farmers and fisherfolk, Belize

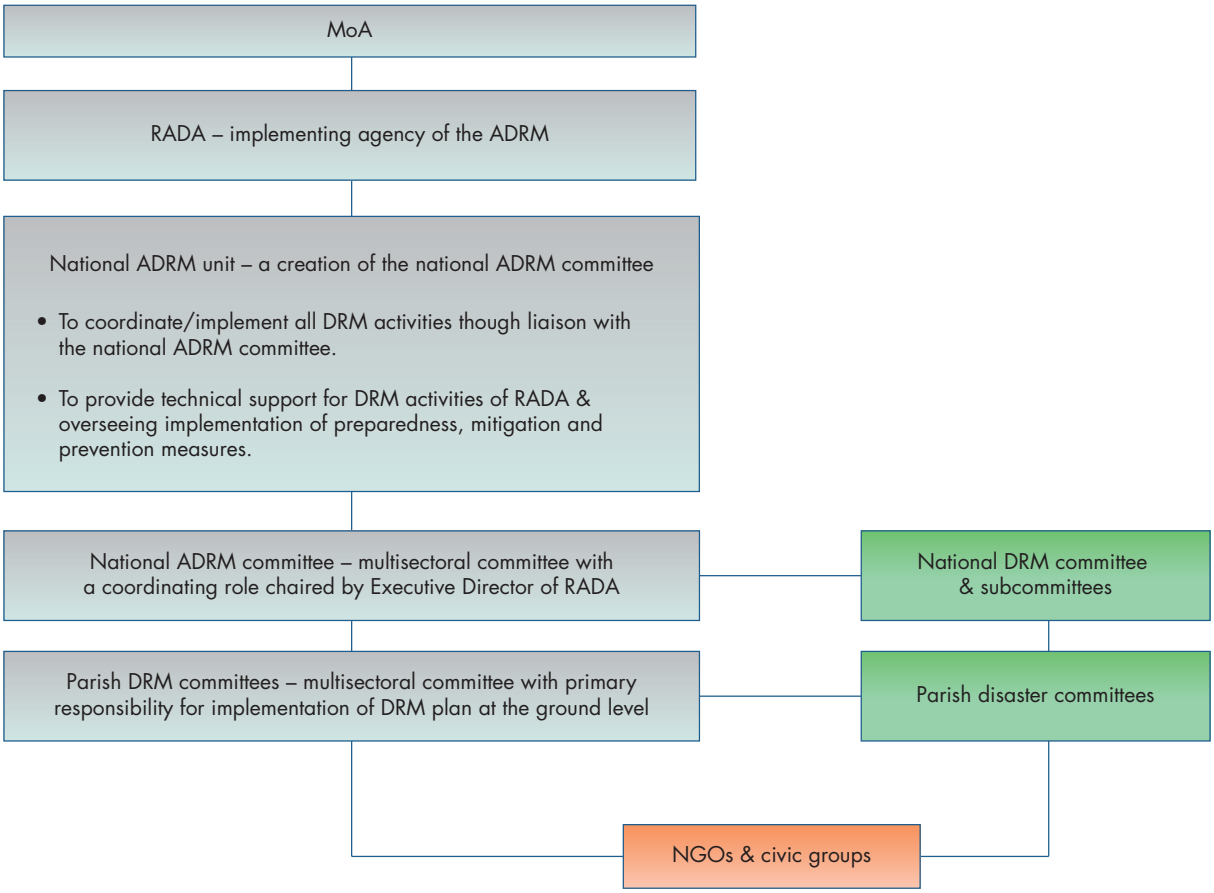
- Establish/agree on a standard methodology for community risk and vulnerability analysis, with a special focus on the agriculture sector, and conduct thereafter a consistent analysis of all hazard-exposed districts/villages of Belize.
- Advise NEMO and other institutions in carrying out an in-depth sociotechnical study on current and future climate risks and impacts on the agriculture and fisheries sectors, and use the study outcomes for agricultural development planning.
- Improve extension staffs' expertise on climate information products, early warning dissemination and ways to enhance outreach to the local level.
- Collaborate with the National Meteorological Service on improved climate information and early warning tools and products tailored to the needs of agriculture producers. These tools will assist farmers to optimally adjust their planting dates, crop varieties, and practices to reduce agricultural vulnerabilities to hydrometeorological hazards.
- Train selected MoAF staff to translate climate information into location-specific agricultural impact outlook and strategic cropping advice on the basis of agrometeorological forecasts.
- Enhance outreach of information products through radio, TV and extension to the grass root level.

- The systematic piloting, evaluation and replication of best practices for DRR suited to the needs of specific locations to increase resilience against natural hazards and climate change is innovative and worthy of replication in other member countries.
- As part of its preparedness interventions, the following interventions can positively impact the response, recovery and rehabilitation phases:
  - Prepare a hazard impact assessment methodology integrating regular baseline assessments with a livelihood-based DALA/DANA for agriculture. The combined methodology will assist the MoA to keep regularly updated community profiles as the basis for reliable post-disaster socio-economic damage and impact assessments in hazard-affected villages.
  - Establish partnership with the credit union and other financial institutions to assess the scope and feasibility for financial back-up and risk transfer mechanisms in the agrisector. Priority areas will be the following: promotion of a culture of saving and insurance for individual farms to recover from risk and development of an incentive program that encourages the productive sector to actively participate in implementing practices that mitigate and adapt to climate change.

3.1.4 Jamaica

- A very comprehensive table of contents that articulated most of the components of an effective ADRM plan.
- Comprehensive hazard mapping, vulnerability assessment and risk profiling of hydrometeorological (drought hurricanes/strong winds and floods) and biological (crop and livestock infestation) hazards informed by credible historical data.
- The ADRM plan is creatively framed within the context of international and national disaster management strategies – namely the MDGs, HFA, International Strategy for Disaster Reduction, Jamaica Food Security and National School Garden Programmes – facilitating synergy and sustainability in programming.
- Institutional framework for DRM is linked to, and parallels, the national DRM structure with strong implementation focus at the community level (see Figure 3.2). Strengths, weaknesses and challenges of the national DRM framework in relation to the agriculture sector, and the comparative advantages of MoAF regarding DRM, are lucidly presented.

Figure 3.2: Proposed institutional framework and implementation mechanism for the Jamaica ADRM plan[41]



- The ADRM plan proposed a formal institutional framework and implementation mechanism to achieve its DRR objectives, with some established roles and responsibilities and horizontal and vertical coordinating protocol with ODPEM[42] and parish-based operating entities.
- Importantly, the institutional structure and mechanism for facilitating a prompt response is also detailed using the above framework.
- Detailed prevention, mitigation and preparedness action plans are presented.
- Standard operating procedure delineating authority, roles and procedures during the emergency phase of DRM is outlined.
- Elaboration of a generic monitoring and evaluation framework, with timelines and target outputs to be completed by the national DRM committee.

41 *Spence, B. 2009. Agricultural Disaster Risk Management Plan – Jamaica (Draft). Applied Disaster Emergency Studies Department, Brandon University, Canada.*

42 *Represents the national disaster management agency, formed in 1993 as a statutory body under the Disaster Preparedness and Emergency Management Act.*

3.1.5 Saint Lucia

- Distinct synergies were established between the HFA, the regional, national policy and legislative framework governing DRM and the national DRM context. In fact, the strategic approach to strengthen capacities for DRR within the agriculture subsector was elaborated based on the five priority areas of the HFA, similar to the pathway used for the Belizean plan.

- The plan elaborated a comprehensive strengths, weaknesses, opportunities and threats analysis of the MALFF capacities for DRR and CCA and used the results to guide development of strategic interventions for DRR.

- Effective mainstreaming of the concepts of DRR and CCA is evident in the draft document.

- The draft document presented an efficient institutional arrangement for DRM in the agriculture sector, as shown in Box 3.3. Development of an integrated resource mobilization strategy for DRR and climate change as a strategic intervention is commendable, and represents a key aspect of DRM planning that is often omitted by member countries. Similarly, the action to establish a monitoring and evaluation system to monitor project implementation, including the impacts of the strategic actions on risk management performance in the sector, is forward thinking and consistent with best practices recommended by the Caribbean Development Bank.

- The community-centered, partnership-based approach to augment capacities for disseminating tailored climate information, early warning and climate impact analysis in the agriculture sectors, offers opportunities for sustainability in programming, and is consistent with best practices at both regional and international levels.

- The participatory approach[43] – elaborated to develop technical options to reduce the underlying risk in the agriculture subsectors through systematic assessment, documentation and adaptation of good practices – is excellent, and should be modelled by other states.

43 *Engaged agriculture producers.*

Box 3.3: Strategy for institutionalizing DRR and climate change within the MALFF

- Nominate a MALFF focal point for DRR/climate change and establish a technical working group composed of departmental focal points from all MALFF departments to coordinate the institutionalisation and delivery of DRM and CCA within agriculture, livestock, fisheries and forestry. The MALFF focal point for DRR/climate change would chair the working group.
- Incorporate DRM and CCA into MALFF's policies and sector planning, including enforcement measures.
- Ensure efficient and transparent communication mechanisms within MALFF related to DRM and climate change.
- Review MALFF's programmes and activities to identify activities that directly relate to DRR and CCA and gaps. Further integrate DRR and CCA in MALFF's portfolio.
- Organize needs-based training for all levels of MALFF staff on DRM and CCA.
- Define roles and responsibilities of MALFF staff regarding DRR/climate change and gradually incorporate DRR- and climate change-related activities into job descriptions of MALFF staff.
- Develop detailed annual implementation plans for each main result area to roll out the strategic framework.
- Set up monitoring and evaluation system to monitor DRR- and climate change-related projects and activities of MALFF, including on impacts.
- Develop an integrated resource mobilization strategy for DRR and climate change implementation programmes through MALFF.

- Similar to Belize, the focus on preparing a hazard impact assessment methodology that integrates regular baseline assessments with a livelihood-based DALA/DANA for agriculture is critical, and can positively impact the response, recovery and rehabilitation phases.
- The prioritization of measures to improve access of agricultural producers to financial risk-sharing mechanisms linked with initiatives in the OECS and CARICOM is important, and can offer a case study or model for member countries once operationalized and successful.

3.2 SHORTCOMINGS/AREAS FOR DEVELOPMENT

3.2.1 Dominican Republic

- The plan is referred to as a Contingency Plan for the Hurricane Season 2011. The title used is restrictive with a short-term focus, and does not address all hydrometeorological hazards that can affect the sector or the broader aspects of DRM, including prevention, mitigation, preparedness, recovery and rehabilitation. This is consistent with the plan's objective, which seeks to facilitate effective and efficient response in crisis periods. Clearly, the prevention, mitigation and preparedness phases of a disaster are not addressed in the above plan.

- Some inconsistencies were noted in the plan regarding hazards of focus. Clearly, hurricanes are the major issue to be addressed through the plan. However, mention is made to floods, droughts and tornados. Detailed hazard mapping and vulnerability assessment is required for drought, floods and tornados (if deemed important).

- Profiling of the country and agriculture sector is inadequate and is required to properly contextualize the ADRM plan.

- The capability of the DEGRYCC as a holistic institution designed to manage all aspects of the DRM cycle including climate variability and change, as revealed through its organizational structure, was not communicated in the draft plan. Its mandate, as developed in the draft plan, appeared to be heavily focused on response which supports a reactive paradigm to DRM. Coherent prevention, mitigation, preparedness and rehabilitation action plans need to be articulated within the context of the role and capability of the DEGRYCC and its affiliated entities. In addition, information on the composition and terms of reference of the various divisions of the DEGRYCC is also lacking.

- The organizational structure of the DEGRYCC should clearly communicate the modality for fostering DRR at the community and farm levels.

- No analysis of the synergies between the ADRM plan and the following were elucidated: international, regional and national disaster management policies and programming; other agriculture and development frameworks; and the national disaster management organizational and/or operative approaches.

- Although a budget is provided for initially activating the contingency plan, no resource mobilization strategy or plan is presented. This can pose serious problems for implementation and sustainability of DRM programming.

- The plan lacks a monitoring and evaluation framework to evaluate the effectiveness and efficiency of implementation, and the impacts of executing the DRM action plans on the risk management performance in the sector.

- There is no inclusion of gender dimensions in planning framework.

3.2.2 Grenada

- The draft plan was not framed within the context of the country and sector profile; this was addressed to some extent in the agriculture disaster management policy.
- Although the objectives of the plan addressed to some degree all phases of the disaster management cycle (except mitigation), it appears to be primarily a response/recovery – and to a lesser extent preparedness – plan. The DRR principles and programmatic interventions related to prevention and mitigation were not articulated. Similarly, no strategic planning is provided for facilitating medium-term rehabilitation of the sector following a disaster.
- The plan identified a list of hydrometeorological,[44] chemical, geological and biological hazards impacting the agrisector. However, it does not indicate the specific hazards addressed through the draft plan. Additionally, it lacks information on risk identification.
- No analysis of the synergies between the ADRM plan and the following were elucidated: international, regional and national disaster management policies and programming; other agriculture and development frameworks; and the national disaster management organizational and/or operative approaches.
- EWS were not included in the draft plan.
- The draft plan did not effectively present an institutional and coordination framework to facilitate implementation of the plan. Mention was made to the communication protocol to be adopted during the response phase, with a focus on vertical communication between the disaster coordinator based in the MoA and district coordinators, to assess the status of staff within the district. A mechanism for facilitating communication with communities and farmers and the principal disaster management agency, NaDMA, was not presented. Importantly, an organizational chart to operationalize the disaster management platform that mimics the national DRM operative framework is available as a standalone document. However, it is not included in the draft DRM plan. Additionally, the specific roles and responsibilities of the main players involved in the DRM organizational structure are not available.
- A mechanism for establishing an emergency fund was included. However, a financing strategy for implementing the plan was not elaborated.
- In summary, the draft document is in the form of a PowerPoint presentation that briefly mentions select components of the ADRM plan, but does not provide the technical details required for a comprehensive DRM plan for the sector.
- The plan lacks a mechanism for monitoring and evaluation, specifically to evaluate the effectiveness and efficiency of implementation, and the impacts of executing the DRM action plans on the risk management performance in the sector.

44 *With the exception of drought.*

- Similarly, it is not engineered on the basis of gender sensitivity, needs of vulnerable groups and CCA. Moreover, sustainability planning is not incorporated in the overall planning framework.

3.2.3 Belize

- The plan lacks detailed risk profiling for drought and floods.
- The draft plan lacks a structural representation of the institutional framework for DRM with detailed roles and responsibilities and lines of communication.
- Low priority is placed on strategic interventions for the rehabilitation phase.
- The plan lacks a monitoring and evaluation framework to evaluate the effectiveness and efficiency of implementation, and the impacts of executing the DRM action plans on the risk management performance in the sector.
- Similarly, gender issues and mechanisms for sustainability programming are not integrated into the document.

3.2.4 Jamaica

- Clear rationalization of the roles and responsibility of the national ADRM unit and committee is needed, since there appear to be some slight disparities in stated functions. For example, both are referenced as coordinating entities, as indicated in the quote below:
- "the national ADRM unit will play a coordinating role for all ADRM activities through constant liaison with the national ADRM committee. The national ADRM unit should be a creature of the national ADRM committee. The committee should therefore play the coordinating role and the unit the implementing role" [pg 32, draft DRM plan].
- In addition, the hierarchical structure of the institutional framework should be revisited to reflect the thinking that the national ADRM unit is a "creature" of the national ADRM committee.
- Detailed terms of reference outlining the scope of work of each entity, comprising the institutional structure for ADRM implementation as illustrated in Figure 3.1, is missing and represents a critical tool for effective operationalization of the plan. Similarly, the technical composition of the national ADRM unit was not provided.
- The draft plan lacks an integrated financing strategy to facilitate sustainable implementation of the DRM plan.

- Although the draft document references the need for the national ADRM committee to develop a monitoring and evaluation strategy, lack of this critical piece of information in the draft plan can result in no or low priority being given to monitoring and evaluation, a historical deficiency of project and programme implementation in the region. Importantly, the monitoring and evaluation framework should be designed to evaluate the effectiveness and efficiency of implementation, as well as the impacts of executing the DRM action plans on the risk management performance in the sector.

- Review of the composition of the national ADRM committee reveals absence of small farmers, research/tertiary academic institutions and local agriculture development agencies (e.g. CARDI, IICA).[45] The roles and expectations of the national ADRM committee should be further discussed to determine relevance of the above stakeholders in the local Jamaican context.

- Although the interventions proposed in the draft plan will achieve to some extent the sector's adaptation to climate change and variability, there is no specific linkage between climate change and the sector's vulnerability in the document. An overt inclusion of the impacts of climate change on the sector, and interventions to build resilience is critical for effective mainstreaming.

3.2.5 Saint Lucia

- More detailed risk identification is needed that clearly illustrates the areas vulnerable to specific hazards.

- The plan is not engineered on the basis of gender sensitivity and/or the needs of vulnerable groups within the agriculture sector.

- Major consideration should be given to consultation with the farming community prior to finalization of the DRM plan to foster greater participation, increased ownership and implementation potential at the district and farm levels.

- Limited or no focus and inclusion of stakeholders or formal entities at the district and/or farm level within the institutional framework for DRM within the MALFF/ agriculture sector.[46]

45 *Later two agencies have implications for research and promotion of best practices in DRR at the field level.*

46 *With the exception of early warning systems.*

3.3 SUMMARY OF INFORMATION INCLUDED IN DRAFT DRM PLANS

Tables 3.1 and 3.2 summarize the degree of comprehensiveness of draft DRM plans in Belize, Grenada, Jamaica and the Dominican Republic.

Table 3.1: Summary of risk profile information included in DRM plans

Country	Hazards included in DRM plan							Information used to develop hazard vulnerability and risk profile			
	Flood	Drought	Winds	Hurricane	Tsunami	Insect infestation	Other	Hazard mapping & assessment	Vulnerability assessment	Impact on sectors	Risk assessment
Grenada	M	–	–	M	M	–	–	–	–	–	–
Jamaica	+	+	+	+	–	+	Bush fires, land-slides	+	+	+	+
Belize	–	–	–	+	–	–	Climate change	+	+	+	+
Dominican Republic	+	M	–	+	–	–	Tornado	+	+	+	+
Saint Lucia	+	+	+	+	M	+	Land-slides, siltation, wildfires, volcanic eruptions, praedial larceny, technological hazards	+	–	+	–

Key:

M *suggests identification of the hazard as affecting the national agriculture sector; however, it was not addressed during plan development.*

+ *Information included to some extent in draft document.*

– *information not included in draft plan.*

Table 3.2: Extent to which key information sets are included in DRM plans

Components of a sectoral DRM plan	Grenada	Belize	Dominican Republic	Jamaica	Saint Lucia
Country and sector profile	–	+		+	+
Linkages with agriculture and development frameworks	–	+	–	+	+
Analysis of national DRM framework in relation to agrisector	–	+	–	+	+
Linkages of national DRM framework and ADRM	–	+	–	+	+
Proposed institutional framework for ADRM	–	+	+	+	+
Organizational structure for operationalization of plan	–	–	+	+	+
Roles and responsibilities	–	+	+	–	–
Prevention action plan	–	+	–	+	+
Mitigation action plan	–	+	–	+	+
Preparedness action plan	+	+	–	+	+
Response action plans	+	–	+	+	+
Recovery and rehabilitation action plans	–	–	–	+	–
Agriculture insurance/ risk transfer mechanism	–	+	–	+	+
Training/capacity building plans	–	–	–	+	+
Monitoring and evaluation framework	–	–	–	–	+
Integrated financing strategy	–	–	–	–	+
Sustainability plan	–	–	–	+	–
Mainstream gender	–	–	–	–	–
Mainstream CCA	–	+	+	–	+
Mainstream vulnerable groups	–	–	–	–	–

Key:

\+ *Information included to some extent in draft document.*

– *Information not included in draft plan.*

CONCLUSION AND RECOMMENDATION

4.1 DISCUSSION AND CONCLUSION

The study revealed a very low prevalence of ADRM plans within the Caribbean. Less than three of every ten countries (26.3 percent) reported having a DRM plan to manage hazards affecting the agriculture sector. Interestingly, consultant support and implementation of DRM-related projects were identified as major contributing factors to plan development. The fact that seven of every ten countries in the Caribbean (73.7 percent) reported not having an ADRM plan is an area of concern with potential negative implications for Caribbean agriculture, food and nutrition security and sustainable livelihoods. In fact, it appears that Caribbean MoAs have placed a low priority on development of ADRM plans, despite the devastating impacts of natural hazards on agriculture economies in the last decade. A clear disconnect between the policy and programmatic focus of member countries and recent and projected hazard realities is obvious.

Technical and financial constraints were identified as the principal constraints for ADRM plan development among the 14 countries without plans. These two deficiencies must be urgently addressed if any serious positive changes are anticipated in the short to medium term. However, the extent to which MoAs are proactively exploring opportunities for technical and financial assistance to develop DRM capacities and/or championing the need for DRM planning, requires further analysis. Cognizant of the above hindrances, a more detailed qualitative assessment should be undertaken to better understand the root causes of low adoption of DRM plans within member countries.

Three country groupings emerged based on the status of development and implementation of ADRM plans listed below:

1) countries with draft ADRM plans, namely Belize, the Dominican Republic, Grenada, Jamaica, Saint Lucia and Saint Vincent and the Grenadines;

2) countries in the process of developing plans, namely the British Virgin Islands; and

3) countries with no plans, to include all of the other 12 countries that participated in the study.

Facilitating approval and implementation of ADRM plans within each group requires

slightly different modalities to achieve the expected outcome. Countries in the first group are required to undertake a detailed assessment of draft plans to identify gaps and pragmatic approaches for addressing deficiencies prior to the commencement of the 2012 hurricane season. This may include the need for technical support from development agencies for countries[47] that lack the requisite skills to promulgate a comprehensive DRM plan. Countries in the second and third groups should consider submitting a request to development agencies for technical support to advance development of required plans in 2012. Opportunities for sharing best practices and lessons learnt during the development of ADRM plans by Jamaica, Belize and Saint Lucia should be facilitated to catalyse future efforts.

4.2 RECOMMENDATIONS

- Member countries should promote the development of an ADRM champion within the various MoAs through establishment of an ADRM Focal Point and/or DRM Coordinator (*timeline: short term*).
- Urgent drafting of roadmaps/action plans by member countries based on the current status of development of DRM plans for the agrisector is imperative. This should be coupled with an aggressive drive to secure technical and financial assistance to operationalize these roadmaps (*timeline: short term*).
- FAO, in collaboration with its development partners, should support the development of regional projects with ADRM plan development and capacity building as two key components. The following are priority areas for capacity building at the regional level:
  - risk identification;
  - development of disaster preparedness, mitigation, recovery and rehabilitation action plans;
  - institutional strengthening;
  - mainstreaming CCA, gender, needs of vulnerable groups in ADRM plans;
  - articulation of integrated resource mobilization strategies for ADRM plan implementation; and
  - tools for monitoring and evaluating DRM plan implementation and the impacts of the intervention on the risk management performance of the agriculture sector (*timeline: short to medium term*).
- A number of pathways can be utilized to develop ADRM plans. Two of the most common include:

47 *Grenada and Saint Vincent and the Grenadines.*

  - the CDM approach popularized by CDERA, which focuses on the development of distinct action plans for reducing risk in each phase of the disaster cycle, as used in the case of the Jamaica's DRM plan; and
  - development of risk reduction action plans based on the five priority areas of the HFA, as used in the case of Saint Lucia's and Belize's DRM plans.

- Implementation must become a culture within the region; the institutional framework within the MoAs in the Caribbean should be strengthened to complement plan implementation. For instance, the ADRM action plans should be mainstreamed into the annual work plan of MoAs (*timeline: short to medium term*).
- Scale up education programmes targeting all stakeholders, especially policy makers and senior administrative officials, to communicate the cost of no action to DRR on livelihoods and national prosperity (*timeline: short to medium term*).
- Subsequent to the writeshop planned by FAO, a regional institution should be identified to monitor and hold countries accountable to develop and implement plans within an agreed timeframe (*timeline: short term*).
- A forum for sharing best practices and innovative technologies for ADRM plans (for example EWS, risk diversion schemes, data/information management) is recommended as a platform for maintaining contact with member countries following the writeshop, while also strengthening technical capacity within MoAs (*timeline: short to medium term*).

Sorghum crop destroyed by mud left by flooding caused by Hurricane Mitch. Approximately 60% of the sorghum crop was lost.

APPENDIX 1: RESEARCH INSTRUMENT

Questionnaire

FAO, in collaboration with its regional partners (Caribbean Development Bank, CDEMA, Inter-American Development Bank and the Caribbean Community Climate Change Centre), is conducting an assessment to determine the status of development and implementation of DRM plans for the agriculture sector in Caribbean countries. We kindly request that you answer the following questions providing as many details as possible to assist us in our assessment process.

Kindly send an email to robertsprojects11@gmail.com for an electronic version of this form so the assessment can be completed online.

Name of Country:

Name of Reporting Officer:

Position/Title:

Ministry/Organization:

Telephone:

Email:

No.	Questions	Answers
Q1.	Does your country have a DRM plan for the agriculture sector?	Yes ☐ No ☐ I do not know ☐ **If *No* or *I do not know*, go to Question 14.**
Q2.	Is the plan in draft form or approved by your Government?	Draft Form ☐ Approved by Government ☐ **Comments:**
Q3.	In what year was the plan developed?	
Q4.	Provide a brief description of the approach/methodology used to develop the plan.	a. **Consultant Support:**
		b. **Level of stakeholder participation:** (e.g. type of stakeholders included, number of times engaged, stage in the development process engaged etc.)
		c. **Type of technical studies used in development of DRM plan:**
		d. **Other:**
Q5.	What was the source of funding for development of the plan (e.g. FAO, Inter-American Development Bank, Government, etc.)? Please indicate amount of money provided.	
Q6.	What are the relevant initiatives, projects or programmes undertaken in your country that contributed to development of the DRM plan?	
Q7.	Share with us specific areas where development agencies may assist your country in implementation of your DRM plan for the agriculture sector.	

Q8.	What were the best practices used in development of the DRM plan?	
Q9.	Did your country experience any challenges in development of the DRM plan?	Yes ☐ No ☐ I do not know ☐ If *Yes*, please explain:
Q10.	Is the DRM plan presently implemented or in practical use?	Yes ☐ No ☐ I do not know ☐ **If *No* or *I do not know*, go to Question 12.**
Q11.	To what extent is the plan implemented or in practical use (e.g. have you begun to build capacities to operationalize the plan, are roles and coordinating mechanisms outlined in the plan established, etc.)	
Q12.	Why is your DRM plan for the agriculture sector not implemented?	
Q13.	Does your country intend to prepare a DRM plan for the agriculture sector?	Yes ☐ No ☐ I do not know ☐ **If *No* or *I do not know*, go to Question 16.**
Q14.	When does your country intend to prepare the plan?	
Q15.	Share with us specific areas where development agencies may assist your country in development of your DRM plan for the agrisector?	

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