

# Training Workshop on Multi-Hazard Early Warning Systems

March 22-25, 2010 Costa Rica

## **Comprehensive Disaster Management (CDM):**

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**A Platform for advancing  
Early Warning Systems in  
the Caribbean**



**Andria Grosvenor**

**Technical Manager, Preparedness and Country Support  
CDEMA Coordinating Unit, Barbados**

# INTRODUCTION TO CDEMA

CDEMA was established in 2009 through an Agreement of the Heads of Government of the Caribbean Community. It replaces CDERA established in 1991

- CDEMA is Responsible for 18 Participating States
- CDEMA Coordinates the Regional Response Mechanism (RRM) in the Caribbean
- CDEMA is the Champion for Comprehensive Disaster Management (CDM) in the Caribbean Region

# THE CARIBBEAN LANDSCAPE

## Significant Hazard Exposure

- Natural Hazards

- Hurricanes
- Floods
- Drought
- Earthquakes
- Volcanoes
- Landslides
- Tsunamis



- Human Induced

- Fires
- Oil Spills
- Chemical Explosions
- Epidemic
- Water Pollution
- Insurrection
- Theft and robberies
- Accidents
- Bomb Threats
- Kidnappings

# A REGIONAL FRAMEWORK FOR DISASTER MANAGEMENT



- Comprehensive Disaster Management (CDM) is the management of **all hazards**
- through **all phases** of the disaster management cycle – prevention and mitigation, preparedness, response, recovery and rehabilitation
- by **all peoples** public and private sectors, all segments of civil society and the general population in hazard prone areas.
- CDM involves **risk reduction & management** and
- **integration of vulnerability assessment** into the development planning process. (CDERA 2001, 2006)

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# CDM IN CONTEXT OF GLOBAL AND REGIONAL AGENDAS

- Hyogo Framework for Action 2005-2015
  - CDM supports priority areas of the HFA
  - Identified as the global platform for Caribbean region
- CARICOM Regional Programming Framework
- Caribbean Single Market and Economy
- St. George's Declaration

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# CDM Strategy Summary

## Goal

*Regional Sustainable Development enhanced through Comprehensive Disaster Management*

## Purpose

*To strengthen regional, national and community level capacity for the mitigation, management and coordinated response to natural and anthropological hazards, and the effects of climate change*

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# CDM Framework 2007-2012 - OUTCOMES

1. Enhanced **institutional support** for CDM Program implementation at national and regional levels
2. An effective mechanism and programme for management and **sharing of CDM knowledge** is established and utilized for decision making
3. Comprehensive Disaster Management has been **mainstreamed** at national levels and incorporated into **key sectors** of national economies (including tourism, health, education, infrastructure, planning and agriculture)
4. Enhanced **community resilience** in CDEMA states/ territories to mitigate and respond to the adverse effects of climate variability and change and disasters

# CDM STRATEGY AND FRAMEWORK

GOAL <i>Regional Sustainable Development enhanced through Comprehensive Disaster Management</i>			
PURPOSE <i>'To strengthen regional, national and community level capacity for mitigation, management, and coordinated response to natural and technological hazards, and the effects of climate change.'</i>			
OUTCOME 1:	OUTCOME 2:	OUTCOME 3:	OUTCOME 4:
Enhanced institutional support for CDM Program implementation at national and regional levels	An effective mechanism and programme for management of comprehensive disaster management knowledge has been established	Comprehensive Disaster Management has been mainstreamed at national levels and incorporated into key sectors of national economies (including tourism, health and agriculture)	Enhanced community resilience in CDERA states/ territories to mitigate and respond to the adverse effects of climate change and disasters
↓	↓	↓	↓
1.1 National Disaster Organizations are strengthened for supporting CDM implementation and a CDM program is developed for implementation at the national level	2.1 Establishment of a Regional Disaster Risk Reduction Network to include a Disaster Risk Reduction Centre and other centres of excellence for knowledge sharing and management in the region	3.1 CDM is recognised as the road map for building resilience and Decision-makers in the public and private sectors understand and take action on Disaster Risk Management	4.1 Preparedness, response and mitigation capacity (technical and managerial) is enhanced among public, private and civil sector entities for local level management and response
1.2 CDERA CU is strengthened and restructured for effectively supporting the adoption of CDM in member countries	2.2 Infrastructure for fact-based policy and decision making is established/enhanced	3.2 Disaster Risk Management capacity enhanced for lead sector agencies, National and regional insurance entities, and financial institutions.	4.2 Improved coordination and collaboration between community disaster organizations and other research/data partners including climate change entities for undertaking comprehensive disaster management
1.3 Governments of participating states/ territories support CDM and have integrated CDM into national policies and strategies	2.3 Improved understanding and knowledge sharing on priority hazards	3.3 Hazard information and Disaster Risk Management is integrated into sectoral policies, laws, development planning and operations, and decision-making (in the tourism, health and agriculture sectors, planning and infrastructure	4.3 Communities more aware and knowledgeable on disaster management and related procedures including safer building techniques
1.4 Donor programming integrates CDM into related environmental, climate change and disaster management programming in the region.	2.4 Existing educational and training materials for Disaster Risk Reduction and Disaster Management are standardized in the region.	3.4 Sectoral Prevention, Preparedness and Response/Mitigation Procedures developed and Implemented (in the tourism, health and agriculture, planning and infrastructure	4.4 Standardized holistic and gender-sensitive community methodologies for natural and anthropogenic hazard identification and mapping, vulnerability assessments and early warning systems developed and applied in selected communities.
1.5 Improved coordination at national and regional levels for disaster management	2.5 A Strategy and curriculum for building a culture of safety is established in the region		4.5 Early Warning Systems for disaster risk reduction enhanced at the community and national levels
1.6 Capacity for monitoring, evaluation and reporting is built			

# EXPERIENCES – Meteorological events



Riverine Flooding Guyana



Flash Flooding Jamaica: August, 2008



Storm Surge Martinique (Eastern Caribbean): November 1999

# Flood : A hazard to tackle with priority in the Caribbean

Floods are the most common, frequent and serious hazards among all disasters in the Caribbean.



# APPROACH FOR FLOOD HAZARD MANAGEMENT IN THE CARIBBEAN

Comprehensive Disaster Management  
(CDM)

Flood Hazard  
Mapping

The first step for  
all measures

Community Disaster  
Management

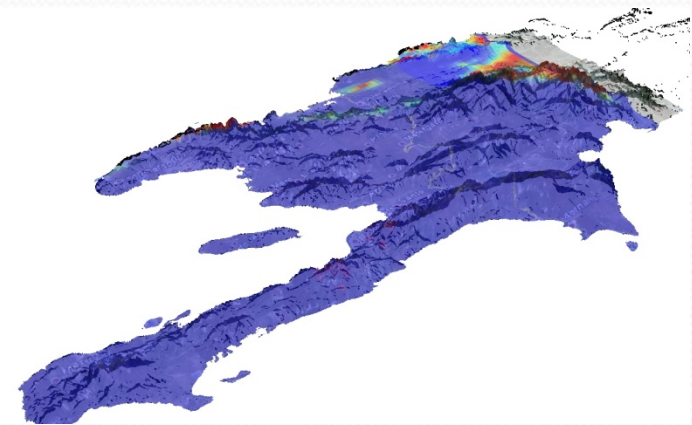
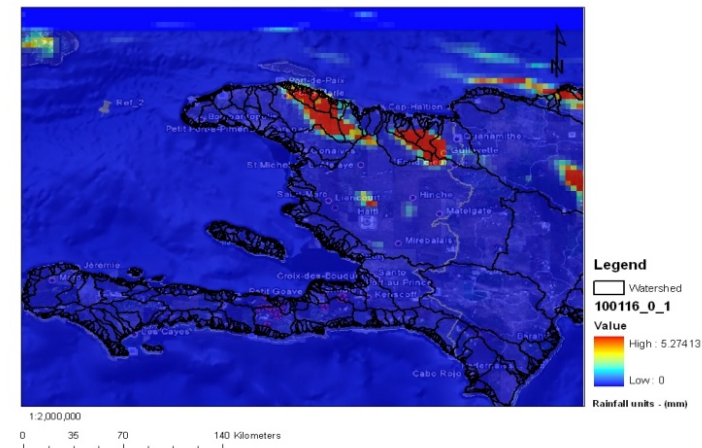
Essential for any  
measures to be  
effective

**CADM**

# FLOOD WARNING SYSTEMS

- Support for Haiti – post January 12, Earthquake
  - Provision of 4km resolution numerical weather prediction rainfall accumulation over Haiti
  - Rainfall forecasts are superimposed onto a map of watershed delineations
  - Outputs are produced daily and posted online for public viewing at <http://63.175.159.26/~haiti>
  - CIMH has been approached to support the production of flood hazard maps to support the recovery and restoration efforts on the ground.
  - Working with CaribRM/CCRIF to identify selection criteria for relocation sites.

Caribbean Institute for Meteorology and Hydrology  
2010/01/15 23:00-2010/01/16 00:00 UTC Forecasted 1 hr Accumulation



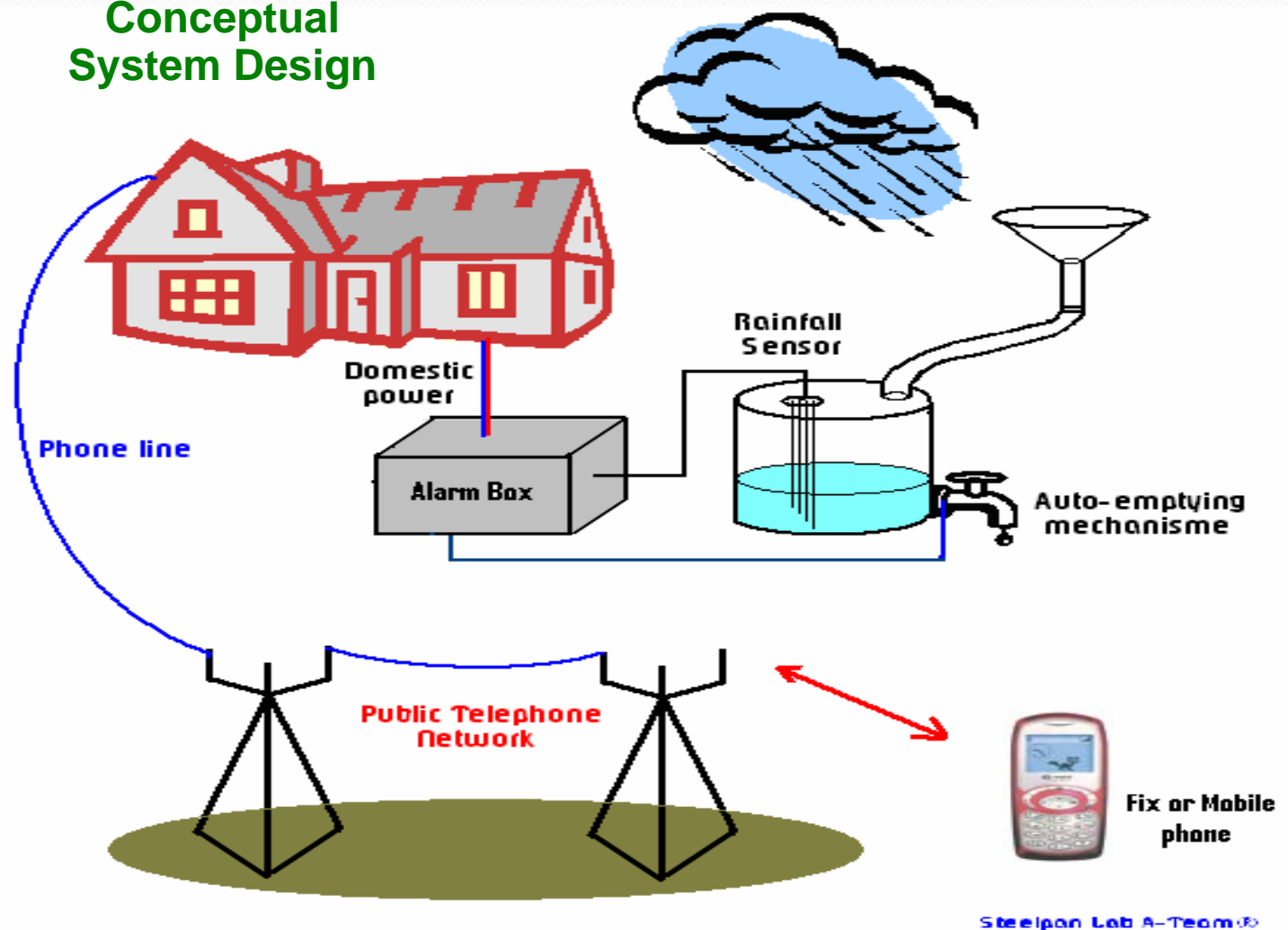
48-hour rainfall outputs over Haiti (watersheds and topography)

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# Community Early Flood Warning

## Conceptual System Design



# Community Early Flood Warning

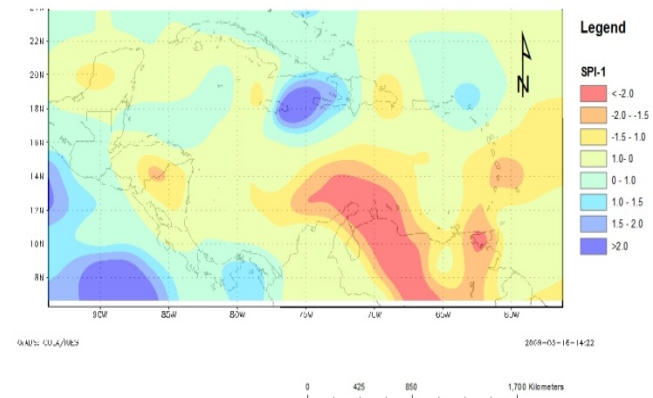
## Features of the System

- **The unit will output a unique level-dependent audible beep pattern approximately 2 minutes after any level has been exceeded. The unit remains silent otherwise.**
- **The unit identifies itself using the telephone caller-ID.**
- **The 11-digit phone number is stored in non-volatile system memory.**
  - **Currently operates ONLY with 115V AC.**

# Drought: Significant emergence in the Caribbean

- Caribbean Drought and Precipitation Monitoring Network
  - Concept was borne out of the need to mitigate and respond to the creeping nature of drought the onset of which may go undetected
  - Regional and national monitoring scales
  - Several indices used SPI, Deciles, PDSI, CMI
- Monthly Weather Summary
  - Climate data for most Caribbean islands

SPI for December 2009



The  
Caribbean Institute for  
Meteorology and Hydrology

<http://www.cimh.edu.bb>

Husbands, St. James BB23006, Barbados  
Tel: 246-425-1362 Fax: 246-424-4733



Today is Tuesday, March 23, 2010 and the current time is 3:06:42 PM

ABOUT CIMH | MONTHLY WEATHER SUMMARY | TRAINING | RESEARCH | PROJECTS | CONSULTANCY | DATA ARCHIVE | PRECIP  
OUTLOOK | STAFF | LINKS | 2010 COURSES | WOMEN IN MET | AGROMET NETWORK | DROUGHT AND PRECIPITATION MONITOR

**Drought Alerts!**  
(Barbados Grenada Alert Update)

# Regional Initiatives

## Instrumentation/Data Collection:

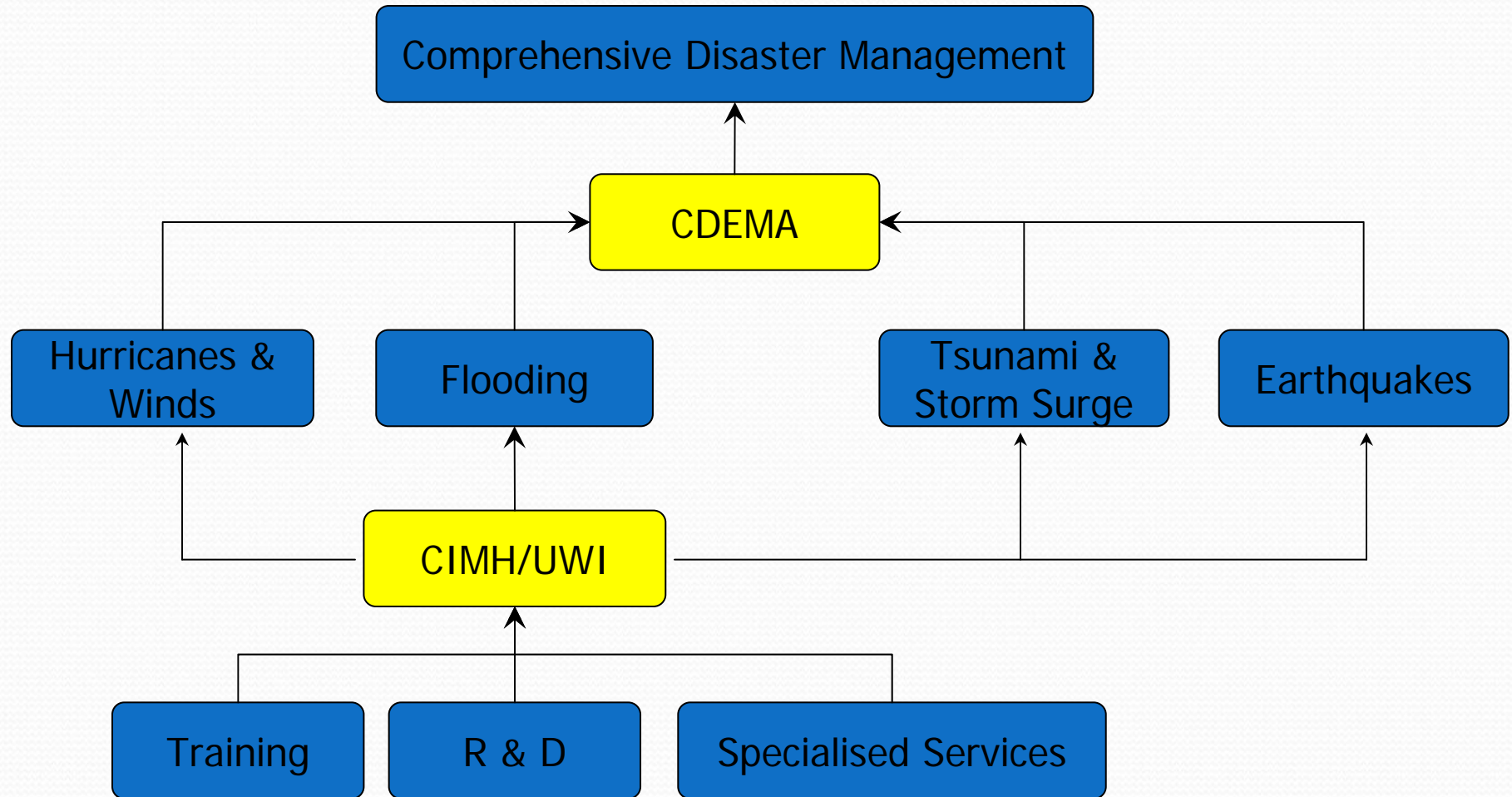
Project	Start Date	End Date	Contract Value	Countries
<b>CARAIBI (comp. 1)</b>	2009	2011	EUR 1,500,000	BDS, DOM, SLA, SVG
<b>Carib-HYCOS</b>	2008	2010	EUR 3,000,000	BDS, TT, JAM, DOM, SLA, ANT, CBA, DOM. REP., MAR, GUA
<b>CARIWIN</b>	2007	2013	CDN 1,000,000	GUY, JAM, GRD
<b>CADM II</b>	2009	2011	-	GUY, BEL, SLA, DOM, GRD
<b>CMO</b>	-	-	EUR 13,200,000	REGIONAL
<b>Data Rescue</b>	2010	2011	TBD	CARICOM MS

# Regional Initiatives

Data/Flood Analysis:

Project	Start Date	End Date	Contract Value	Countries
<b>Flood Insurance</b>	-	-	-	REGIONAL
<b>Advanced Forecasting</b>	2009	2011	USD 209,000	BDS, JAM, GUY
<b>Risk Atlas</b>	2009	2011	USD 700,000	SLA, JAM, GRD, TT, DOM, BDS
<b>CADM II</b>	2009	2011	-	GUY, BEL, SLA, DOM, GRD
<b>RBSP</b>	2009	2009	USD 126,000	BHS, CI, GUY, MSR, SVG, TT
<b>EC R3I</b>	2009	2011	EUR 5,000,000	OCTs

# Regional Perspective

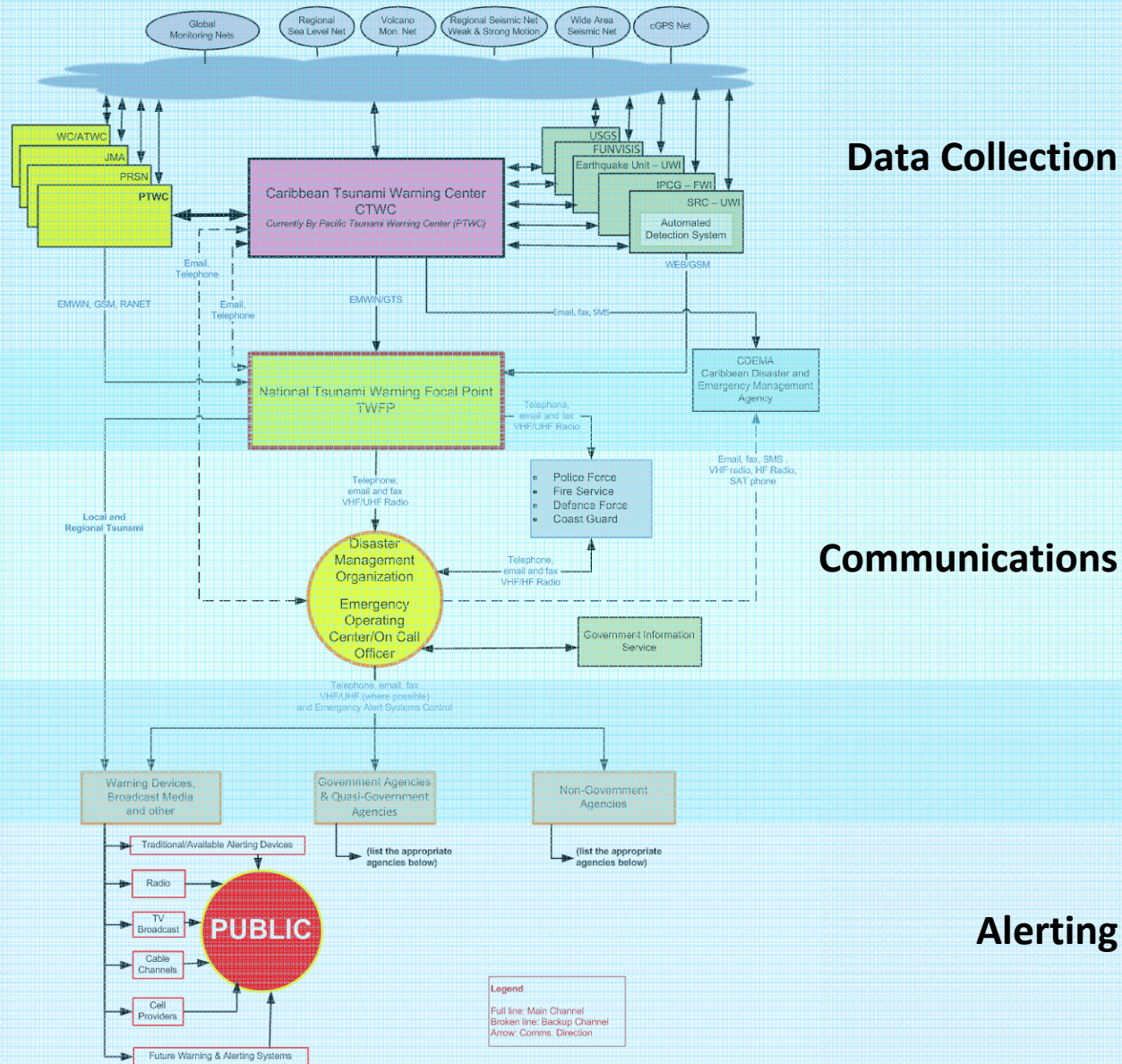


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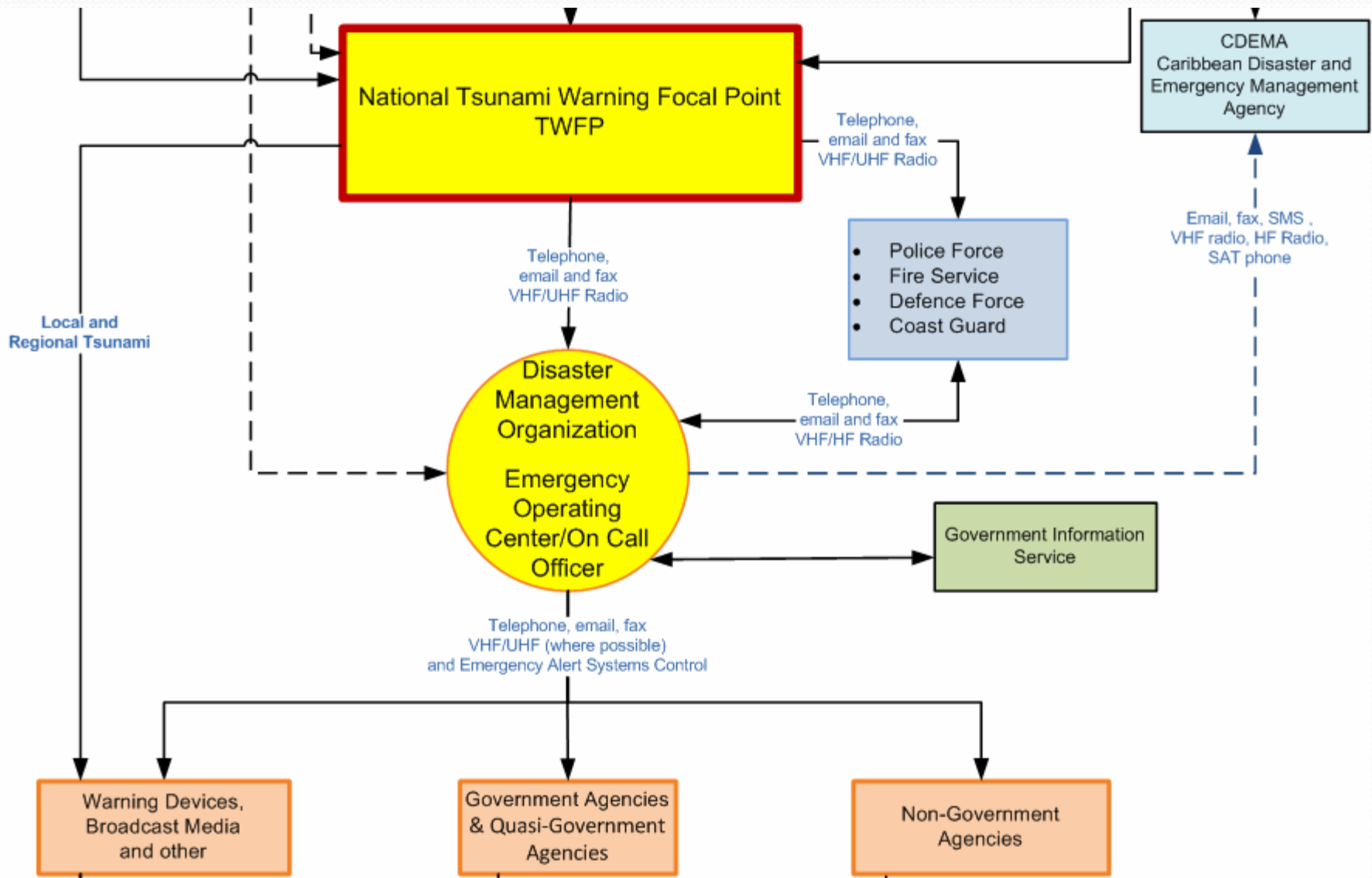
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# Tsunami – A low frequency, high impact hazard

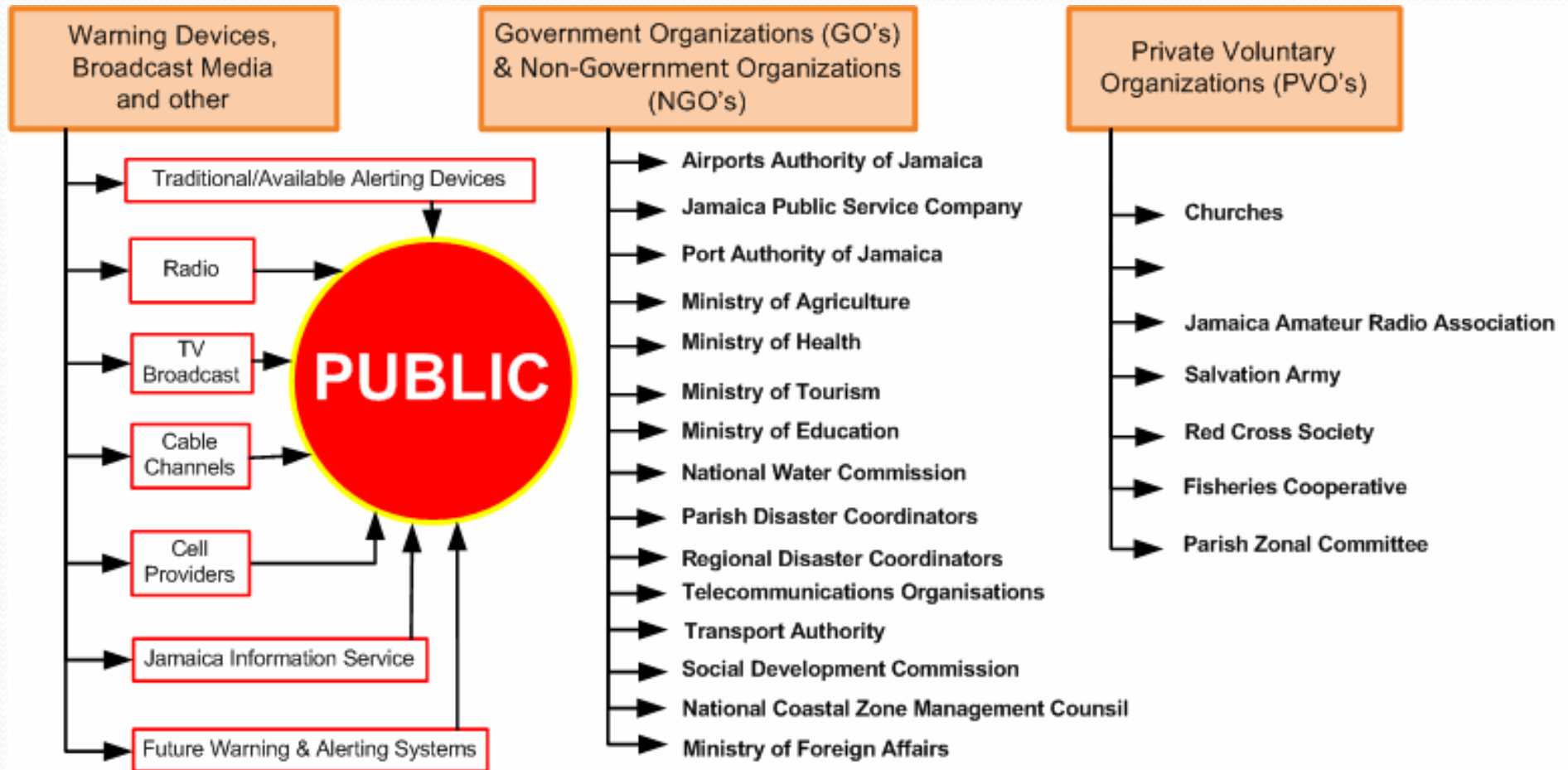
## Tsunami and Other Coastal Hazards Warning Protocol



# Communications



# Alerting - Jamaica



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# CDM AND EARLY WARNING SYSTEMS

<b>GOAL</b> Regional Sustainable Development through CDM			
<b>PURPOSE</b> <i>'To strengthen regional, national and community level capacity for mitigation, management, and coordinated response to natural and technological hazards, and the effects of climate change.'</i>			
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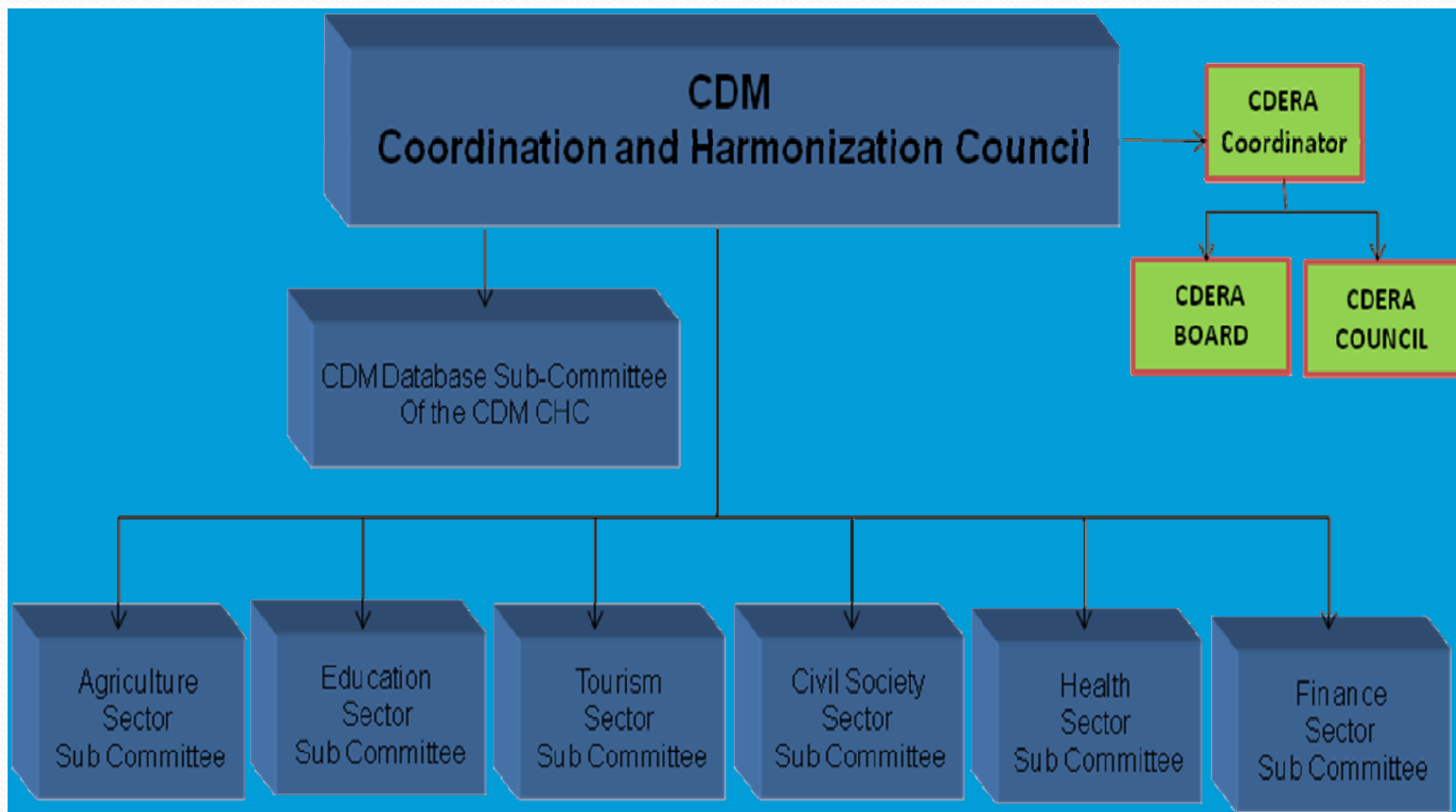
# CDM Strategy Results – Specific EWS Related Results

- **Institutional Capacity Building**
  - Output 1.1 National Disaster Organizations are strengthened for supporting CDM implementation and a CDM program is developed for implementation at the national level
- **Knowledge Management**
  - Output 2.2 Infrastructure for fact-based policy and decision making is established/enhanced
  - Output 2.3 Improved understanding and knowledge sharing on priority hazards

# CDM Strategy Results – Specific EWS Related Results

- Mainstreaming CDM in Key Economic Sectors
  - Output 3.3 Hazard information and Disaster Risk Management is integrated into sectoral policies, laws, development planning and operations, and decision-making (in the tourism, health and agriculture sectors, planning and infrastructure)
- Community Resilience
  - Output 4.5 Early Warning Systems for disaster risk reduction enhanced at the community and national levels

# The CDM Governance Structure



CDERA transitioned to CDEMA on September 1, 2009

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# The CDM CHC MEMBERSHIP

- I. **CDEMA Subregional Focal Points**
- II. **Development Partners** : which include CIDA, DFID, UNDP, EU
- III. **Sector Leads**: Tourism: *Caribbean Tourism Organization*; Education: *University of the West Indies*; Agriculture: *Food and Agriculture Organization*, Health: *Pan American Health Organization*, Civil Society: *Caribbean Policy Development Centre (CPDC) and IFRCs*
- IV. **Research Partners**: *CIMH, UWI, SRC*

# Conclusion

- Limited resources and similar/common challenges has underpinned the Caribbean's efforts at regional approaches
- CDM as an accepted Caribbean HFA platform is key for advancing EWS in the Caribbean region
- The CDM Coordination and Harmonisation Council offers a key opportunity for advancing a thematic coordination mechanism for consideration of EWS and linking to key economic sectors

# Conclusion

- There are a number of existing initiatives that calls for strengthening or sustaining the interaction between meteorological/hydrological and disaster management community – climate variability and change, tsunami etc.
- Strengthening of institutional partnerships at the regional level in the context of CDM is the proposed modality for delivery of EWS platform
- Strengthening of the regional institutional support to national and community mechanisms will deliver tangible results at the grassroots results.



# THANK YOU

## Contact Information

Email:

[andria.grosvenor@cdema.org](mailto:andria.grosvenor@cdema.org)

Tel: (246) 425-0386

Website: <http://www.cdema.org/>