DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION
BELIZE

Caribbean Regional Conference
“Integrating Climate Change Adaptation into Coastal Zone Management”

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BACKGROUND

• Increased impacts from Atlantic tropical cyclonic events and other hazard has created a change in philosophy and practice of disaster management; from responsive to a more proactive approach.

• The nature and severity of these impacts from extreme weather events depend not only on the intensity of the events, but also on our exposure and vulnerability.

• Our settlement patterns and changes in socioeconomic conditions have both influenced trends in exposure and vulnerability to extreme weather events.

• Belize’s coastal settlements in particular, are exposed and vulnerable. Five of our major population centres lie along our coast; along with tourist resorts. These activities also contribute to increased vulnerability.
Hazards Impacting Belize

- **2003 Extreme Temperatures:**
  - Belize experienced a severe dry season. Heat waves in April and May resulted in degraded pastures which affected the livestock and poultry) and caused widespread bush fires.

- **2006 Floods:**
  - January, flooding in the Belmopan area caused major disruption in traffic as the Western Highway just outside the city was washed out.
  - May, 18.6 inches of rain fell in the Stann Creek District, flooding the Pomona and Melinda area.
  - June the Western and Hummingbird Highway junction was submerged, over 22.83 inches of rainfall was recorded.
Hazards Impacting Belize (2)

- **Hurricane Dean 2007**
  - 15-25% beach loss in the northern Belize.
  - 60% approx. of the standing vegetation near the Corozal Town and Consejo areas was either severely damaged or completely topped.
  - 20% of Caye Caulker and San Pedro mangroves were affected

- **2007 Extreme Temperatures:**
  - This year saw the “end” of the extreme temperatures which started out in 2003. Three major forest fires in the Mountain Pine Ridge, resulting in some 20,000 acres of natural, regenerating pine trees destroyed.
• **2008 Multi-Hazards:**
  - TS Arthur impacted over 36,500 people (5 deaths);
  - TD No. 16
    - Earthquake: Southern Belize
    - Fire: Waste Disposal Site Belize (30 acres)

• **2010 Tropical Cyclones:**
  - Direct impact of four tropical storms and one hurricane (Richard).
  - Five major flooding events.

• **Coastal erosion, uprooting of sea grass and damage to the reef system as a result of storm surge and wave action.**
Disaster Risk Reduction and Climate Change Adaptation

• Most emergencies/disaster originates from hydromet events.
• DRR and adaptation to CCA looks at reducing vulnerability and increase resilience to adverse impacts of weather and climate related hazards.
• The combination of an exposed, vulnerable and ill-prepared population with a hazard event can results in a disaster.
• CC adding new risks
What is at Risk??

- People/communities
- Critical infrastructure
  - Transportation network, government/private facilities, hospitals, utilities
- Natural resources
- Environment
  - Critical habitats
  - Flora and fauna
- Economic Stability
Belize Risk profile

- 2011 population est. 307,899; 52% resides in urban areas.
- Economic drivers: coastal tourism, export of marine and agriculture products.

Exposed values: Distribution of by District

Exposure units: Residential; Non-residential (commercial/industrial, institutional and agriculture); Infrastructure.
Economic and Population Statistics

<table>
<thead>
<tr>
<th>Population</th>
<th>GDPPC</th>
<th>Economic Composition %</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Agriculture</td>
</tr>
<tr>
<td>307,899</td>
<td>US$8,300</td>
<td>29.0%</td>
</tr>
</tbody>
</table>

- Breakdown of GDP by exposure type
Multi-discipline Approach

- Areas of focus: DRR; CC adaptation; Environmental management and economy.
- Efforts almost independent of each other.
- Vulnerability to natural hazards and CC increasing.
- Need to strengthen collaboration and information.
Belize’s Vulnerability to DR & CC

- Productive sector: country has limited resources to plan for and respond to the effects of climate change.

- Silo approach: increase in-ability to cope; limited financial capacity.

- Unplanned development, poor land use, poor environmental practices.

- Degrading environment makes rural population whose livelihood rely on it vulnerable.

- Data and analysis needed to improve forecast.
Reducing the Risks

- Create awareness and knowledge of risks
  - Strategize and leverage resources
  - Disseminate information to meet user level.
- Mainstream DRR into planning and development.
  - Risk Assessments - analyze jointly DR and CC risks (e.g. floods and sea level rise).

**HAZARD**
- Frequency
- Magnitude
- Area

**EXPOSURE**
- People
- Economy
- Structures

**VULNERABILITY**
- What specifically makes us not able to cope

**CLIMATE CHANGE**

**REDUCING THE RISKS**
- Decision support systems
- Losses by sector/district Scenarios
- impact on development

**RISK MANAGEMENT STRATEGY**
- DRR and CC adaptation actions
- Legal & Policy improvement
- Probabilistic analysis
Implementing CDM: managing ALL hazards through all phases of the disaster cycle, by ALL sectors.

Building Codes: Belize Bureau of Standards promoting the development of standards & putting together the necessary building codes that are applicable to Belize.

Public Works: critical infrastructure

Hydromet: FEWS

LUA: land use planning & development

Risk transfer: CCRIF insures government risk and is designed to limit the financial impact of catastrophic hurricanes and earthquakes

Governance/Law: Strengthening the DPR Act to incorporate CDM principles

Economy: risk reduction being incorporated into strategic development.
Risk Information Development
Belize City – AAL Hurricane

AAL
[US$]

- 17 - 5,000
- 5,001 - 20,000
- 20,001 - 50,000
- 50,001 - 150,000
- 150,001 - 360,000
Risk Information Development

Belmopan AAL Hurricane - wind

<table>
<thead>
<tr>
<th>AAL (US$)</th>
<th>45 - 500</th>
<th>501 - 2,000</th>
<th>2,001 - 5,000</th>
<th>5,001 - 10,000</th>
<th>10,001 - 29,000</th>
</tr>
</thead>
</table>
Coastal Erosion Hazard Mapping

- Bathymetric & topographic digital data in order to facilitate storm surge analysis, wave modelling and erosion
Intervention Strategies

• Political Commitment to DRR and CCA - Legal, policy and practice to guide national actions.
• Increase public awareness and education of DRR and CCA
• Develop methodologies to integration of DRR and CCA into disaster preparedness and response
• Strengthen capacities at local, national and regional levels. Promote community adaptation and risk reduction – resilient communities.
• Promote synergies between DRR and CCA in the implementation of the Strategies to manage risks to extreme events.
• Improved identification, assessment and analysis of risks.
Summary

• During the last ten years we have seen an increase in the number and frequency of major hurricanes in the Caribbean. Almost doubling the two previous decades.

• Climate change will affect disaster risks through:-
  • increases in weather and climate related hazards
  • increases in the vulnerability of communities to natural hazards
  • ecosystem degradation, reductions in water and food availability, changes to livelihoods, and rapid unplanned urban growth.

• Disaster Risk Reduction and Climate Change Adaptation should be given high priority at all levels.

• DRR and CCA has the same objective of reducing vulnerability to weather and climate related hazards.
"We do not inherit the Earth from our Ancestors, we borrow it from our Children"

Native American saying

Thank You!

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