“Challenges facing the Caribbean in the coming decades and policy options promoting crop diversity to address them”

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Caribbean Agriculture

- 92% of the population live in SIDS
- Poor competitiveness
  - High land prices
  - Small farms - lack of economies of scale
  - High cost of labour/ high cost of transport/ input cost
- Globalisation
- Environment – investment risk
  - Hurricanes/ Earthquakes
  - Drought/flooding
  - Investment Risk
- **Climate Change Predictions - adverse**
The Caribbean
Belize – archipelago of islands – Guyana, Suriname
<table>
<thead>
<tr>
<th>Caribbean islands</th>
<th>Per capita land area</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arable, ha</td>
<td>% of</td>
<td>Agric., ha</td>
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<tr>
<td></td>
<td></td>
<td>critical</td>
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<tr>
<td>Puerto Rico</td>
<td>0.009</td>
<td>13</td>
<td>0.078</td>
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<tr>
<td>US Virgin Islands</td>
<td>0.038</td>
<td>54</td>
<td>0.094</td>
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<tr>
<td>Turks &amp; Caicos</td>
<td>0.066</td>
<td>94</td>
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<tr>
<td>Cuba</td>
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<td>470</td>
<td>0.651</td>
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<td>Jamaica</td>
<td>0.069</td>
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<tr>
<td>Dominican Republic</td>
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<tr>
<td>Haiti</td>
<td>0.107</td>
<td>153</td>
<td>0.219</td>
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<tr>
<td>St. Kitts &amp; Nevis</td>
<td>0.171</td>
<td>244</td>
<td>0.243</td>
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<tr>
<td>St. Lucia</td>
<td>0.028</td>
<td>40</td>
<td>0.139</td>
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<tr>
<td>St. Vincent/ Grenadines</td>
<td>0.062</td>
<td>89</td>
<td>0.142</td>
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<td>Dominica</td>
<td>0.07</td>
<td>100</td>
<td>0.296</td>
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<tr>
<td>Grenada</td>
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<td>Barbados</td>
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<td>36</td>
<td>0.072</td>
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<tr>
<td>Trinidad &amp; Tobago</td>
<td>0.058</td>
<td>83</td>
<td>0.102</td>
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</table>
Projected impacts of global climate change on the Caribbean region are expected to be devastating.

Caribbean’s annual cost of inaction
- $10.7 billion
- $22 billion by 2050
- $46 billion by 2100

Representing 5%, 10% and 22% of GDP of the Caribbean economy.

Global Climate Change will have a disproportionate effect on Small Island States.

Addressing Climate Change is first among 14 priority areas for sustainable development.

Barbados Programme of Action
Climate change predictions

Transformational change
1. Reducing GHG emissions by 45% by 2020 and by >95% of 1990s levels by 2050 to ensure that global surface temperature does not rise above 1.5°C of pre-industrial levels.
2. Adaptation and capacity building to climate change
3. Need for financing climate change

Liliendaal declaration, 2011
Some CARICOM countries more vulnerable

The projected annual cost of inaction by 2025 as a % of GDP is:

Antigua and Barbuda 12.2%,
Bahamas 6.6%,
Barbados 6.9%,
Dominica 16.3%,
Grenada 21.3%,
Haiti 30.5%,
Jamaica 13.9%,
St Kitts and Nevis 16.0%,
Saint Lucia 12.1%,
St Vincent/Grenadines 11.8%,
Trinidad and Tobago 4.0%.
Projected Climate Change Impacts

1. Global warming (0.2°C per decade)
2. Sea level rise (8-10 mm per year)
   - coastal erosion
   - saltwater intrusion
3. Increased frequency and ferocity of weather events
   - Hurricanes/ tropical storms
   - Flooding/ infrastructure damage
4. Disruption of rainfall - vast majority of land is rainfed
   - droughts
5. New pest and disease scenarios
Vulnerability of the Caribbean

RESILIENCE
1. Lack of a policy framework
2. Coastal regions are low/ accentuated by sand mining destruction of mangroves
3. Poor conditions of the marine environment
4. Poor conditions of upper watersheds – deforestation
5. Poor land use planning
6. Low biodiversity of agricultural systems/ lack of breeding
Climate change impacts on Agriculture

- Reduced productivity (low precipitation, high night temperature etc)
- Greater losses (flooding, drought, salinity, pest and diseases).
- Food Insecurity
- Low stability (increased risk profile)
- Stochastic (unpredictable)
Overcoming climate change challenges

Towards a more resilient agriculture system
Overcoming challenges

Agriculture has to become more resilient

Transformation in the management of resources—
land, water, nutrients, **genetic resources**

Transitioning into systems that (a) improve the carbon sink (b) reduce GHG emissions (c) climate change adaptations

- **Ecosystem management** – land use planning, reservoirs, watershed mgt
- **Production systems** – diversified, modified cropping patterns, zero tillage, mulch, rotations, agro-forestry, organic, upland.
- **Farm management** – biodiversity, ponds, embankments', terracing, compost, adapted varieties, fertility mgt – deep, slow release, modified; biogas; stop slash/burn
Greenhouse gas emissions from agriculture and land use

- Methane from livestock (enteric fermentation)
- Wetland rice, manure management
- Deforestation (clearing of land and burning)
- Land use or soil management
- Other

SOURCE: Baumert, 9
National Planning – Early warning/ buffer stocks/ development planning

Translated into food security policy and plans

Translated into strategies, actions, projects that can create a change.

Public awareness programmes, capacity building programmes, farmer field schools (bottom up), climate science – R&D & communication, incentives, insurance, agric. credit, social safety nets, payment for environmental services
Improving Crop Diversity

OBJECTIVES
1. Improving productivity
2. Improving the resilience of the production system/ reduce risk
PRINCIPE-1
Create a diversified agriculture system

Ecosystem planning

Addresses country level resilience
Foster animal and crop farming, recycling, composting, biogas, aquaponics, avenue cropping, multiple cropping
PRINCIPLE-3
Move away from monocropping

Multiple cropping, crop rotations, agroforestry, avenue cropping, intercropping
PRINCIPLE-4
Move away from purelines/hybrids

Homogenous, limited inbuilt variability.

Favour open-pollinated varieties, synthetics, bulk varieties, composites
PRINCIPILE-5
Foster genetic improvement for adaptation

Tolerance to pests and diseases, tolerance to drought, waterlogging, salinity etc
PRINCIPLE-6
Support conservation and utilisation of indigenous genetic diversity

Build agro-industries based on comparative advantage (prioritisation score card)

Develop quality niches based on indigenous genetic resources

Develop them into knowledge industries supported by R&D

Move up the value chain

Exploit direct marketing opportunities afforded by eMarketing

Nurture industries towards sustainability
Policy options to support crop diversity

National Planning – International Treaties and Agreements

Translated into food security policy and plans -

Translated into strategies, actions, projects that can create a change.

Genetic improvement programmes, Biotechnology/ breeding, Public awareness programmes, capacity building programmes, farmer field schools (bottom up), incentives, insurance, agric. credit, social safety nets, payment for environmental services
Thank you