

Strengthening the Climate Resilience of Caribbean Agriculture

PRACTICAL SOLUTIONS FOR ON-FARM MANAGEMENT OF SOIL AND WATER

Gregory Gouveia

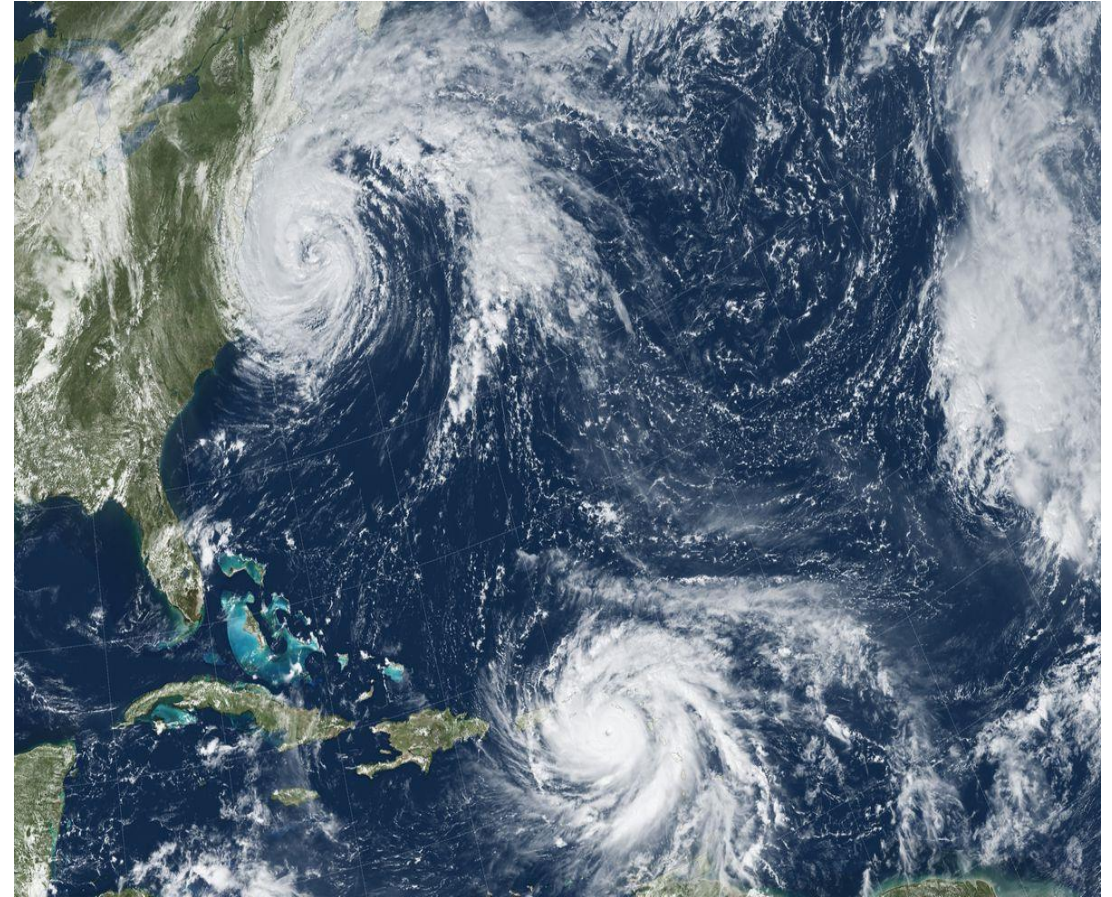
UWI, St. Augustine



Caribbean
Climate Responsive Agriculture
FORUM

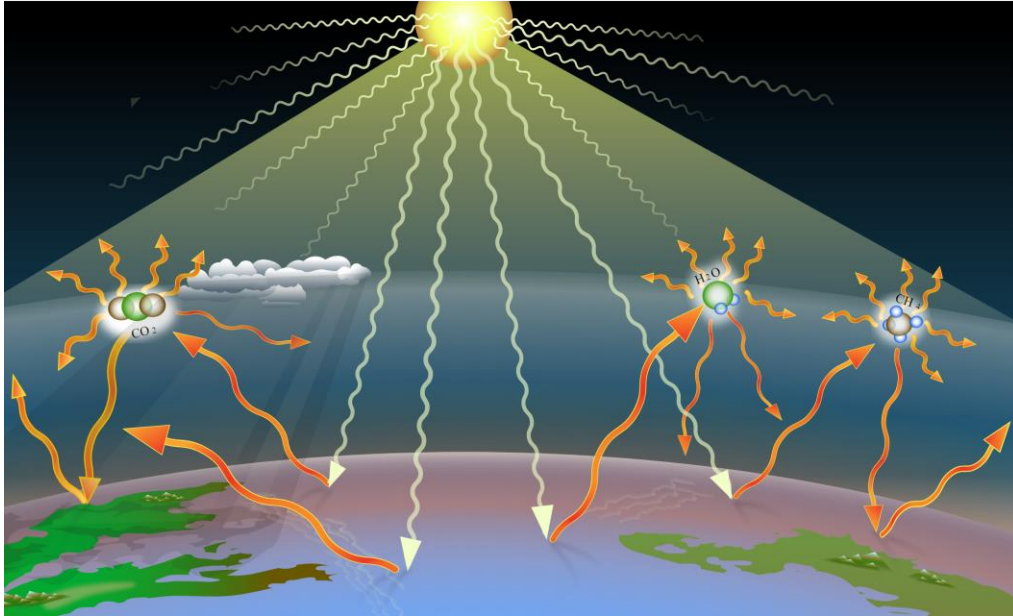
Outline

- Climate Change and the Caribbean
- Climate “**Smart**” Agriculture
- Key “Take-aways”



Climate Change

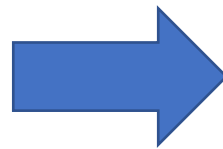
IPCC - a change in the state of the climate due to persistent anthropogenic (human-induced) changes in the composition of the atmosphere



**Greenhouse
Gasses**



**Global
Warming**



Sea Level Rise
More Extreme Events
Greater Climate Variability

What's in store for the Caribbean ??

- Sea Level Rise
- Less Total Rainfall
- More Frequent Extreme Events
- Greater Unpredictability
- Temperature Rise



Caribbean is Highly Vulnerable due to

- Very High Population Densities
- Generally Small Land Areas
- Small and Fragile Economies
- Not Food Secure



2 Key Aspects of Climate “Smart” Agriculture

ADAPTATION - building resilience against the adverse climate realities

MITIGATION - reducing Green House Gas (GHG) Emissions : CO₂, CH₄ and N₂O

Should Caribbean Priorities be on Adaptation ???

Of Course !!!!!

ADAPTATION

WHY??

- **Increasing Temperatures** → increase water and carbon loss; reduce yields
- **Rising Sea Level** → soil and water salinization
- **Drought** → crop failure (sandy/coarse soils)
- **Excessive Rainfall** → erosion; saturation; inundation (clayey/fine soils)
- **Storms/Hurricanes** → completely damage crops

ADAPTATION STRATEGIES

CROP

- Agro-Ecological Zoning (AEZ)
- Multiple Cropping Systems and Staggered Harvesting
- Cover Crops

ADAPTATION STRATEGIES

SOIL and WATER

✓ **Shift to Conservation Tillage (CT)**

or **Less Conventional Tillage**



Conservation Tillage Benefits

✓ **Improves Soil Quality**

....through Carbon Conservation and Sequestration

✓ **Other Benefits from Crop Residues**



Other Relevant Adaptations

Irrigation Water Management

- ✓ Water Quality Testing
- ✓ Low volume systems

Improved Crop Nutrition Management

- ✓ 18 nutrients are essential
- ✓ Nutrient Testing of Soil and Crop samples



Mitigation

what is responsible for the GHG emissions ??

CO₂ - *carbon dioxide*

- Mainly due to tillage



Mitigation

CH₄ - *methane*

Soil Carbon converts into CH₄ in Flooded Rice



Mitigation

N_2O – *nitrous oxide*

From N fertilizers (synthetic and organic)



Mitigation Strategies

CO₂

Conservation tillage

Keep more crop residues in the fields

Manures as well but not excessive

Cover Crops

CH₄

Drain rice fields and add less organic materials

N₂O

Soil and Crop tissue testing for N

KEY “take-aways” and Recommendations

1. Climate Change is Real
2. Your Priority is **ADAPTATION** – make your farm more resilient

Conservation Tillage

KEY “take-aways” and Recommendations

- 3. Test Irrigation Water regularly and use Low Volume Systems**
- 4. Tests Soils and Crops for Essential Nutrients**

KEY “take-aways” and Recommendations

5. Agro-Ecological Zones for each Country



6. Be Very Observant and Keep Records

Note that the collective group of circumstances can make each farm unique

END