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Climate Change Pressures on Caribbean Agri-Food System

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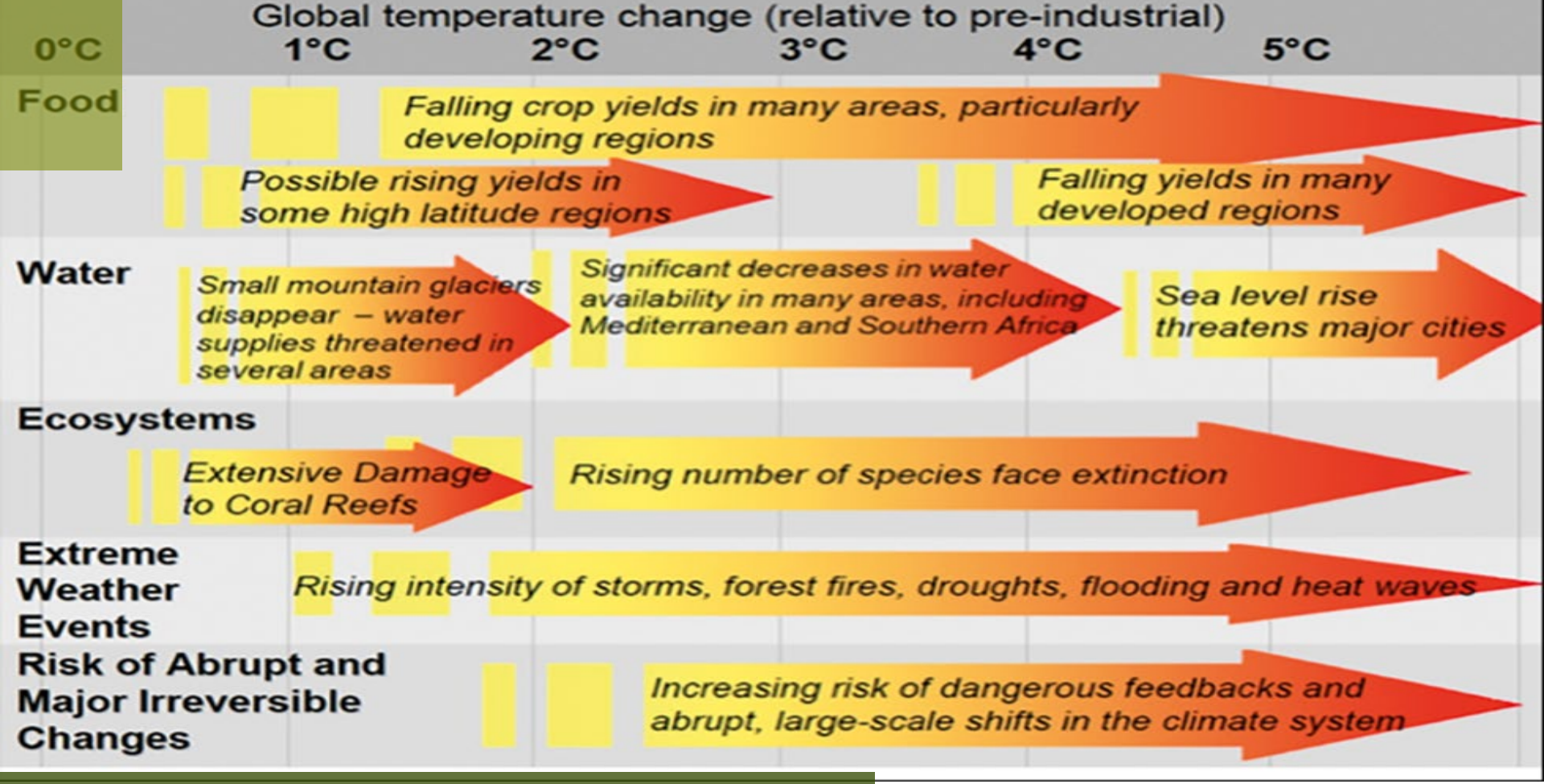
Food Security in the Caribbean

Major Factors that contribute to food insecurity in the Caribbean

- Climate Change
- Limited Agricultural Productivity
- Dependence on Food Imports
- Vulnerability to Natural Disasters
- Limited Access to Land and Resources
- Poverty and Inequality
- Pests and Diseases



The Impacts of Climate Change

Climate Change in the Caribbean

Mean surface temperatures in the Caribbean have increased by ~ 1.0 degree Celsius over pre-industrial times.

Warming is occurring at ~ 0.2 degrees Celsius per decade. 1.5oC of warming may occur by 2030. (IPCC, 2018)

Sea levels are rising at ~ 3 mm/year and the rate of sea level rise is increasing. (IPCC, 2013)

Global mean sea level rise suggest an indicative range of 0.26 to 0.77 m by 2100 for 1.5°C global warming. (IPCC, 2018)

SLR at the equator will be higher than the global mean. (IPCC, 2013)

The Caribbean Sea and the Atlantic Ocean are becoming more acidic. (SCOR, 2009).

70 - 90% of coral reefs will die at 1.5oC of warming. 99% of coral reefs will die at 2.0oC of warming. (IPCC, 2018)

Climate Change and Food Security

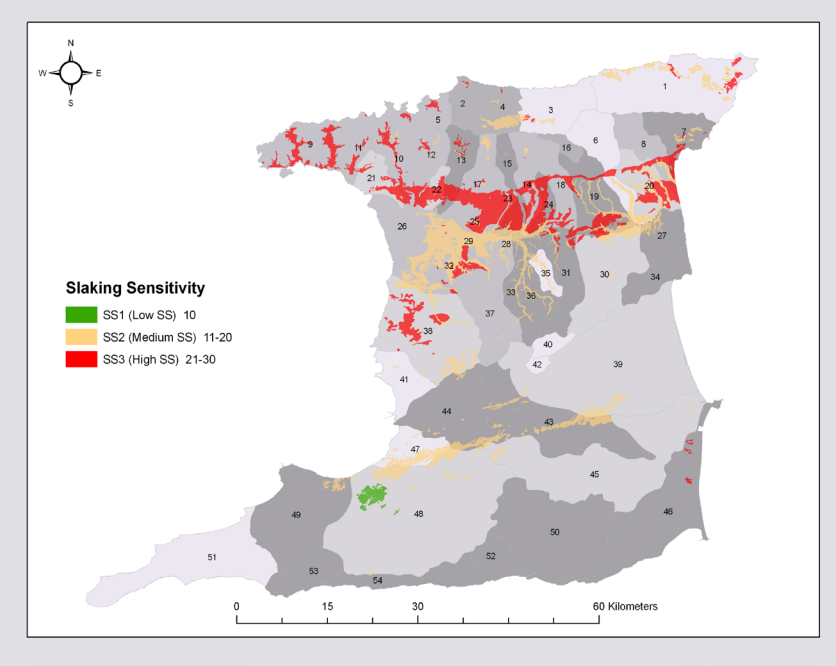
Hydroclamatic events

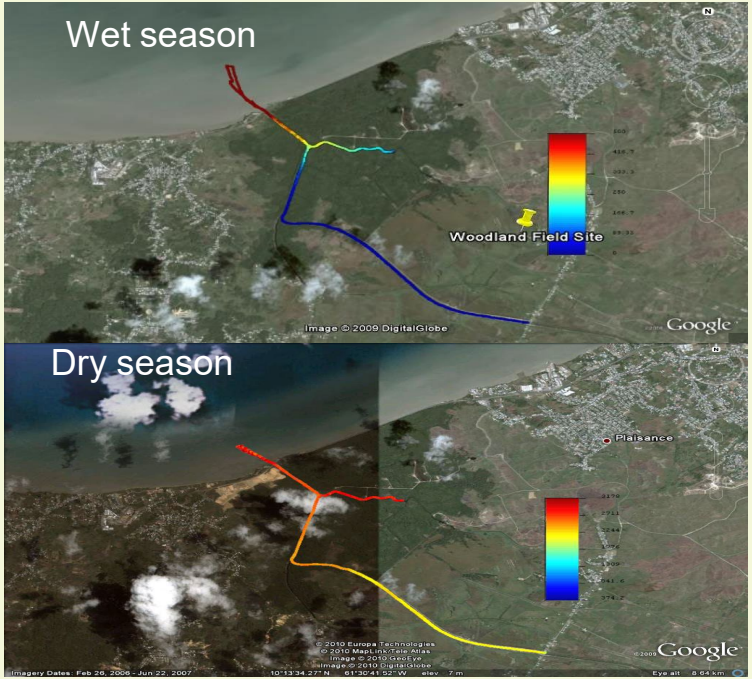
Agriculture

Supply chain disruptions

Soil degradation and Saline water intrusion

Trinidad Soils: >80 of soils highly slaking sensitive
Wuddivira et al., 2010 LDD



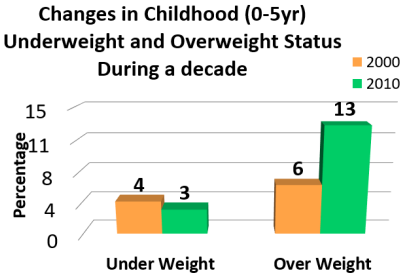


Salt water intrusion further in land in South Oropouche River, Trinidad

BIG PROBLEMS EXACERBATED BY CLIMATE CHANGE

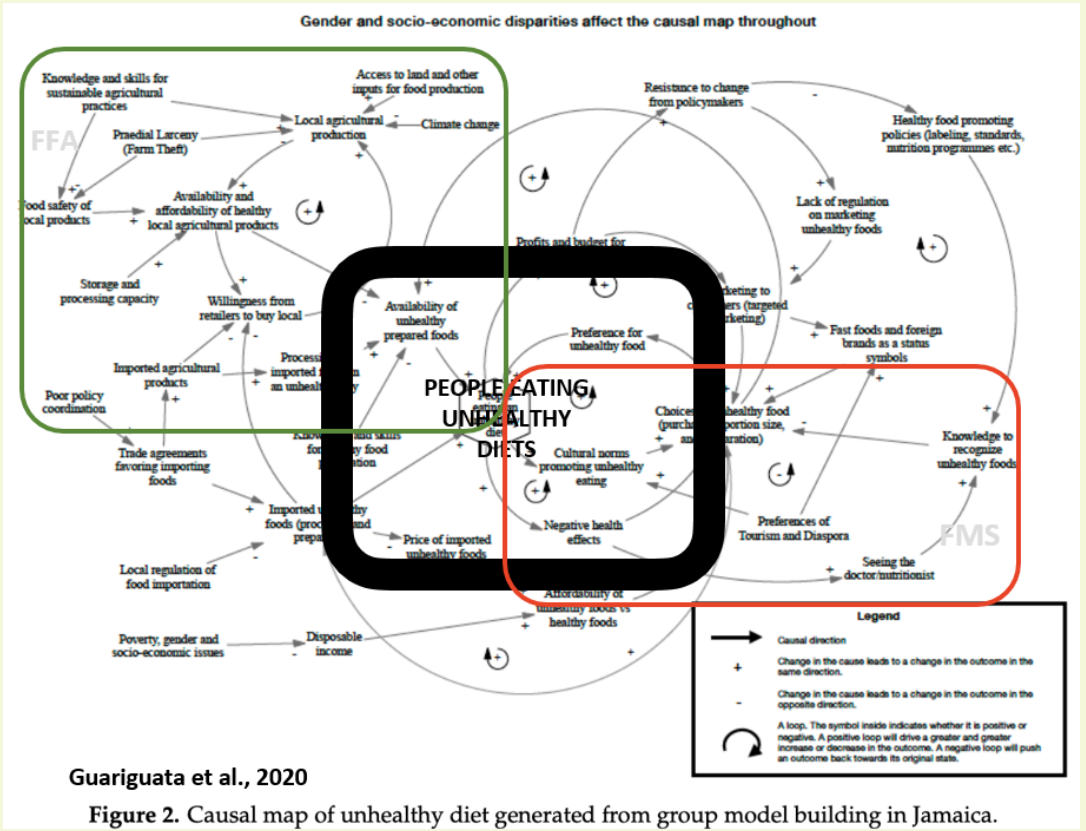
- FOOD INSECURITY
- NUTRITION INSECURITY
- LIFESTYLE DISEASES
- ENVIRONMENTAL DEGRADATION

A regional obesity epidemic



Source: CFNI

1 in every 5 children are overweight/ obese and are at risk of developing non-communicable diseases later in life.



Guariguata et al., 2020

Figure 2. Causal map of unhealthy diet generated from group model building in Jamaica.

Science & Technology for Secure Agri-food Systems in the Caribbean

S&T are indispensable in advancing success towards SDG2 (Zero Hunger) in the Caribbean

S&T tools are critical in building modern, strong and sustainable food and nutrition systems in a safe and resilient Caribbean environment.

Science and Technology for Food Security

Food availability

1. Conventional cross-breading
2. Transgenic crop
3. Soil Management
4. Irrigation Technologies

Food access

Post-harvest loss Technologies:
1. Storage
2. Handling
3. Refrigeration
4. Transport
5. Processing

Food use and utilization

1. Biofortification

Food stability

1. Adapting food production to climate change
2. Precision agriculture
3. Early warning systems

Science and Technology Tools

Tissue culture and micropropagation of disease free planting material

Biotechnology for genetic breeding of biotic and abiotic tolerant varieties of domestic food crops

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Biotechnology techniques to identify pathogens rapidly using PCR and DNA sequencing.

Conventional breeding

Embryo transfer technology and molecular genetic analysis

Precision Agriculture-

Remote and proximal sensing, sensor, drone and digital technologies

Robotics in Agriculture-

agro-processing and harvesting robotics technology

Climate-smart technologies

Climate-resilient plants-

Adaptation to salinity, drought, floods

Increasing soil health-

resilience to erosion, salinity, and reduced moisture content

Farming technologies-

Irrigation and drainage technologies

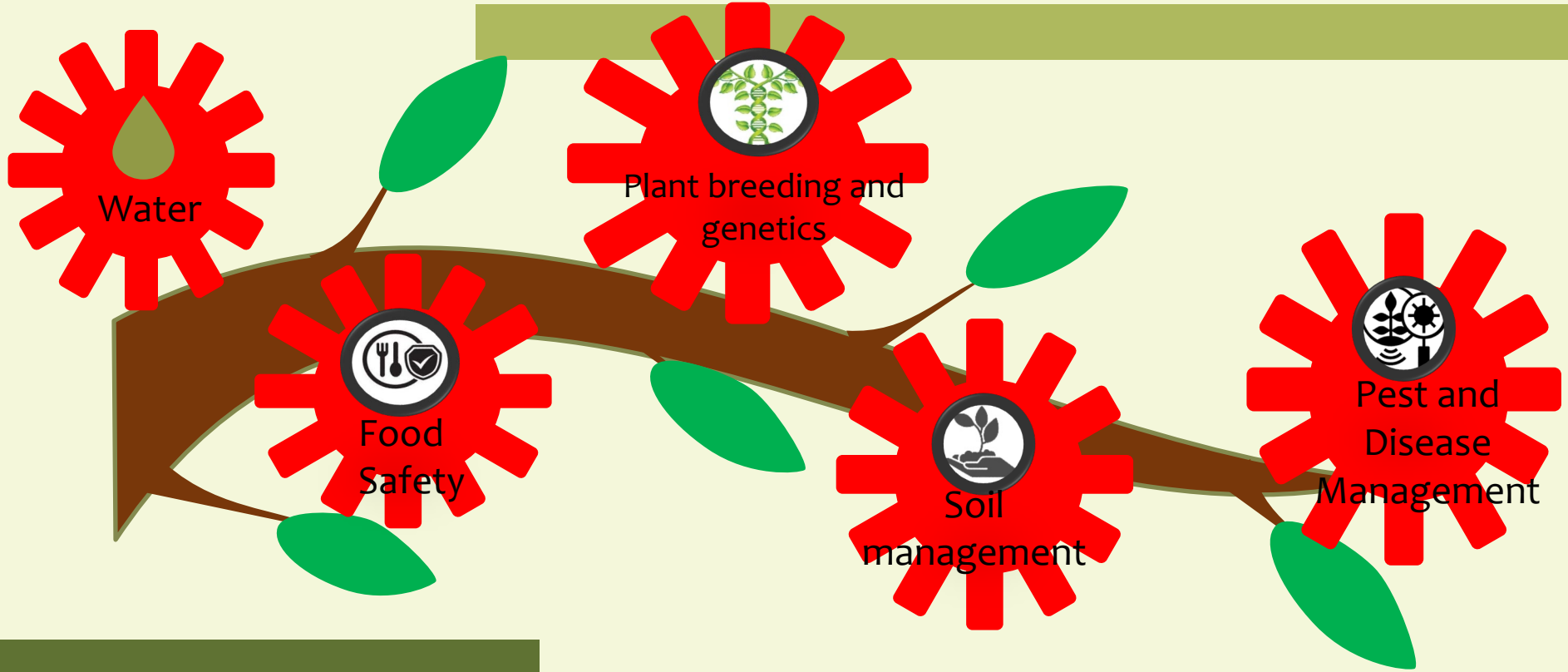
Water harvesting technologies

Resilient Livestock Production

Early warning systems

The Potential of Nuclear Technologies in Caribbean Agri-food Systems

Nuclear Science Technology Tools in Agriculture



Towards SDG 2 (Zero Hunger) in the face of climate change

Requires comprehensive and integrated approaches

- Investing in sustainable agriculture
- Promoting climate-smart technologies
- Improving resilience to natural disasters
- Enhancing access to credit and markets
- Supporting small-scale farmers
- Empowering vulnerable groups
- Strengthening regional cooperation and coordination
- Promoting policies that prioritize food security, sustainable development, and resilience-building efforts.

Thank You!