



# Understanding hydro-meteorological hazards



# Introduction to hydrometeorological hazards

Hydrometeorological hazards are extreme weather events that can significantly impact the environment and human activities, particularly agriculture.



# Drought



A prolonged period of abnormally low rainfall, leading to water scarcity

Can result in crop failure, reduced soil moisture and increased pest pressures

# Drought Impacts to Crops

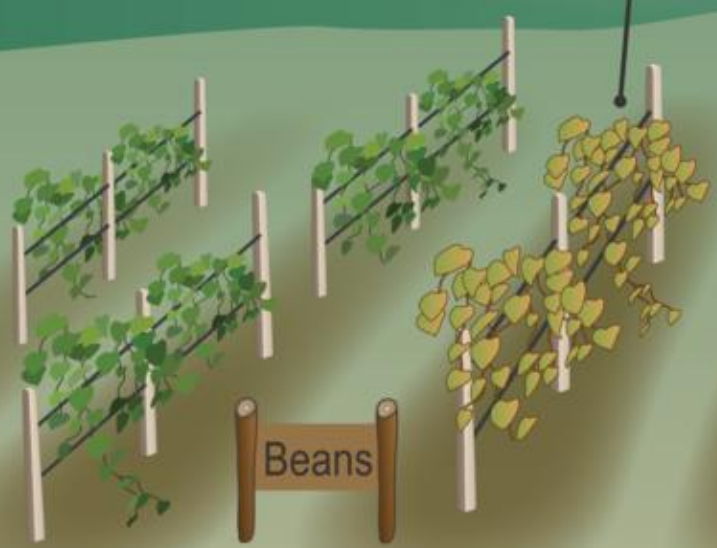


Decreased soil moisture reduces productivity of crops

This text is positioned in the middle ground of the landscape, with two black arrows pointing towards the crops in the foreground.

Decreased soil moisture increases vulnerability to pests

This text is located on the right side of the image, with a black arrow pointing to a banana plant that has several red insects on its leaves.



A satellite image of a hurricane over the Gulf of Mexico. The hurricane is a large, circular storm system with a distinct eye and a dense, swirling cloud structure. The surrounding ocean is dark blue, and the landmasses of North and Central America are visible in shades of green and brown. The text is overlaid on the left side of the image.

## Hurricanes

Intense tropical storms characterized by strong winds, heavy rainfall, and storm surges.

Can cause immediate destruction to crops, livestock, and infrastructure.

Disruption of supply chains and market access, leading to economic losses.

## Floods

Excessive rainfall or storm surges that inundate land.

Can lead to soil erosion, waterlogging, and contamination of water sources.

Spread of diseases due to water contamination, affecting both crops and livestock.

## Case study: 2014-2015 drought in Jamaica



*The Yallahs River, one of the main water sources for Jamaica's Mona Reservoir, was dry for months. © Desmond Brown/IPS*

The 2014-2015 drought was one of the worst recorded since the 1970s.

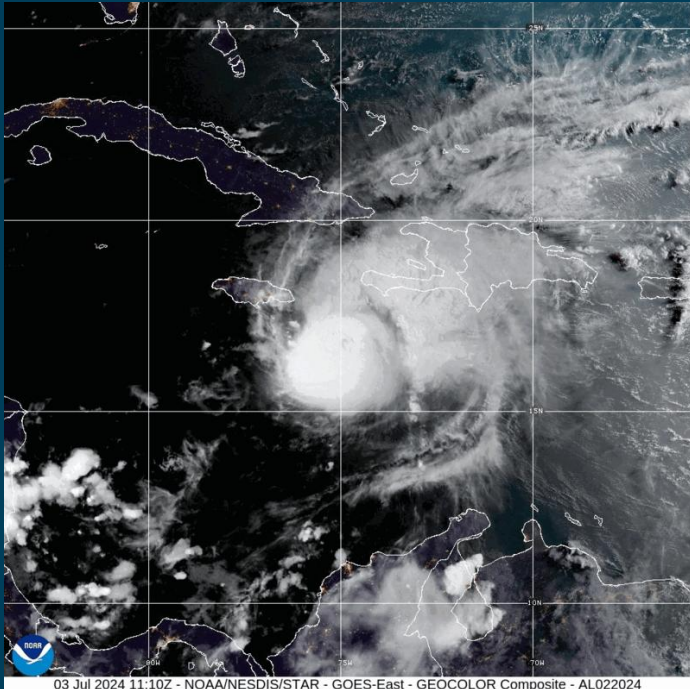
Agriculture was heavily impacted, with a reported 40% reduction in crop yields for staple crops such as yam and sweet potatoes.

Farmers adopted water conservation techniques, such as rainwater harvesting, to mitigate the effects.

RADA and the Jamaican Meteorological Service (JMS) produced new seasonal drought-related forecast information for farmers.

Agricultural-production losses of the farmers who received the information service were significantly smaller. Some farmers were able to prevent agricultural-production losses by up to 40%.

## Case study: hurricanes in Jamaica



Hurricane Dean (2007) caused extensive damage, resulting in losses of over \$200 million in the agricultural sector.

Hurricane Beryl (2024) caused an estimated USD 4.7 billion in damage in the agricultural sector, affecting approximately 45,000 farmers across the southern parishes of Clarendon, Manchester, and Saint Elizabeth.

Key crops such as plantains, yams, cassava, mangoes, and bananas were severely affected, leading to long-term recovery efforts.

Post-hurricane strategies include rebuilding with more resilient practices, such as planting wind-resistant crop varieties.

## Case study: 2016 flooding

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# Lessons learned

Importance of integrating sustainable practices to enhance resilience.



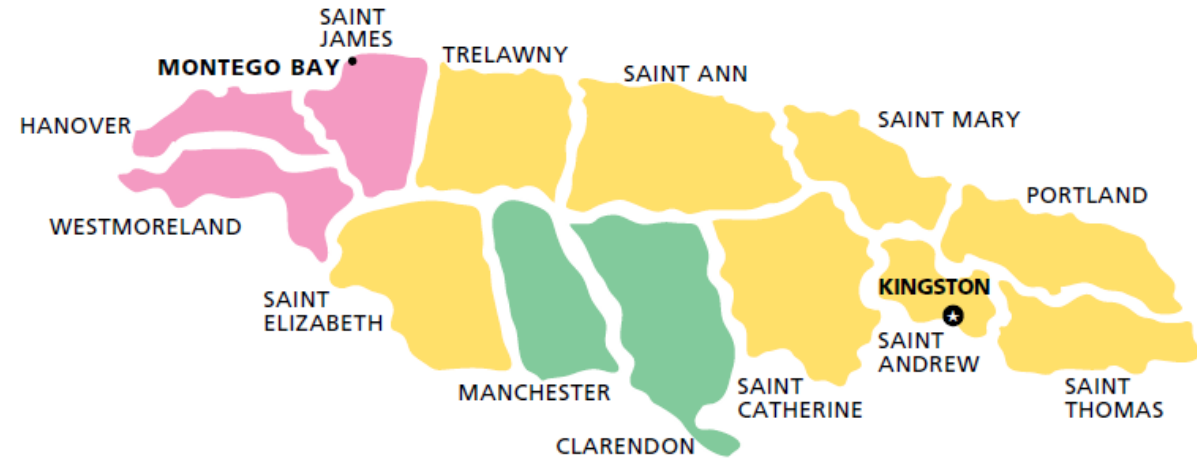
Need for better forecasting and early warning systems to prepare for hazards



Collaboration among farmers, government, and NGOs to develop adaptive strategies and support systems.



# Geographical distribution of climate-related risk



## Lowest risk (risk index < 0.5%)

- Clarendon 10%
- Manchester 8%

## Highest risk (risk index > 1.0%)

- Hanover 3%
- Westmoreland 8%
- Saint James 9%

## Mid-risk (risk index between 0.5 and 1.0%)

- Kingston 2%
- Portland 3%
- Saint Andrew 18%
- Saint Ann 7%
- Saint Catherine 13%
- Saint Mary 4%
- Trelawny 4%
- Saint Elizabeth 8%
- Saint Thomas 3%