

# Climate Impacts and Resilience in Caribbean

## Work Package 3 – Farm Level Assessments

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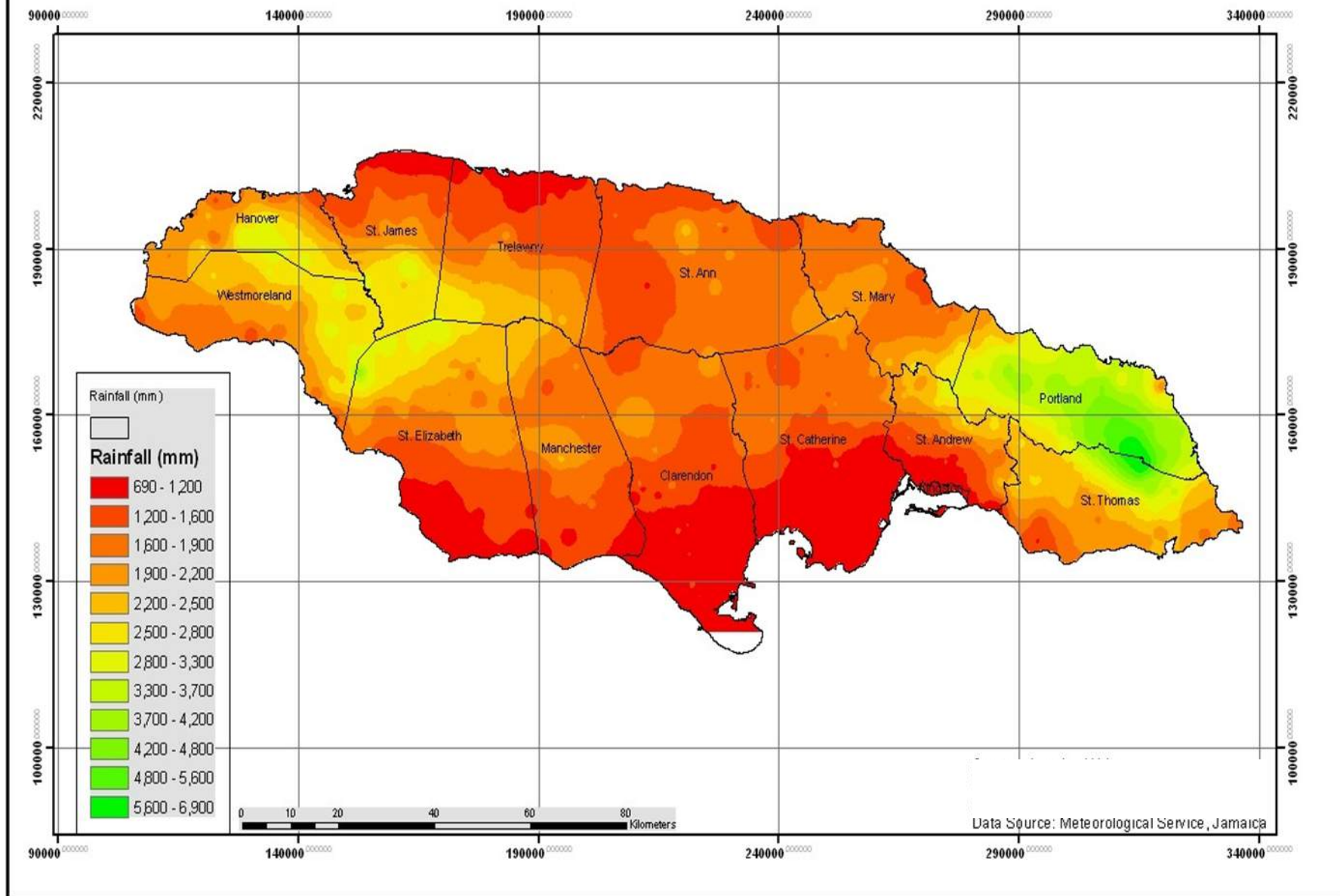
## Background

- WP3 builds on the activities carried out under WP1 and WP2
- complements model results with in-depth analyses of local farmer knowledge, attitude and risk perception of climate change and variability.

# Methodology

- Community based assessment of local farmers' knowledge, risk perceptions and vulnerability to climate variability and change in established farming communities in Jamaica and Trinidad.
- involved a semi-structured questionnaire survey of farmers operating in established cocoa and tomato-growing areas (purposive sampling)
- survey captured baseline data informed by farmers' own local technical knowledge and experiences to ground-truth the scientific model results and outputs.

# THIRTY YEAR MEAN RAINFALL DISTRIBUTION FOR JAMAICA

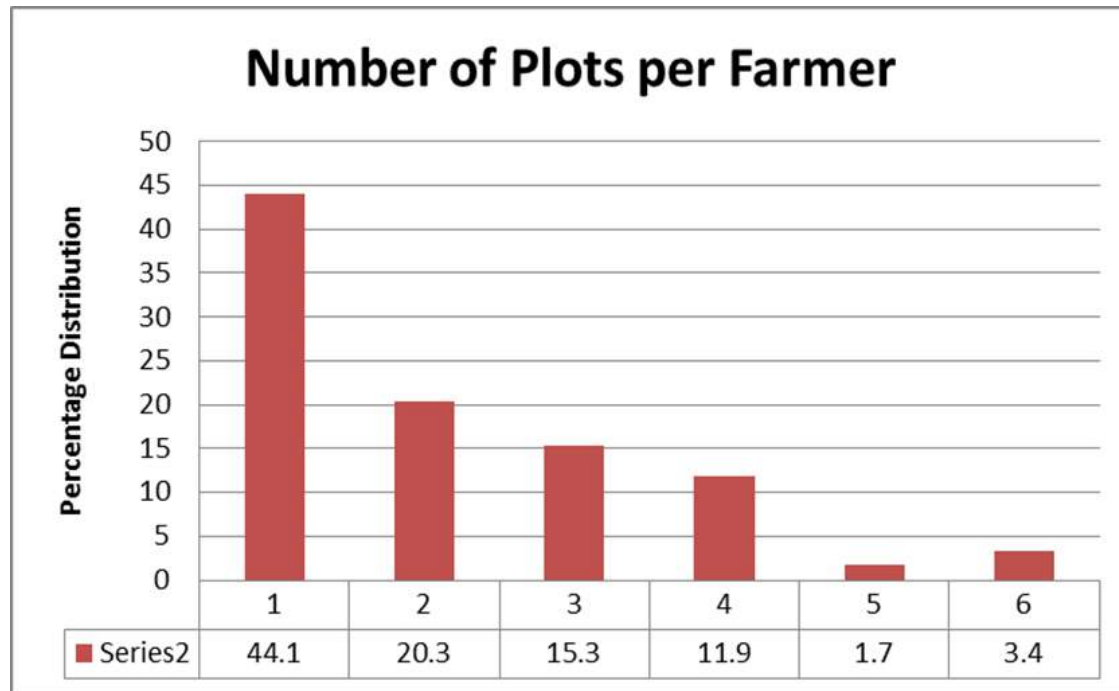


## Findings – Socio-demographic characteristics

- Primarily results from the Jamaica fieldwork
- Fieldwork was conducted b/w November and December 2014.
- A total of 59 farmers were surveyed using a detailed questionnaire survey instrument
- Questions covered: general farming practices; production challenges and; socio-demographic characteristics.
- Predominantly males (92%); full-time (89.8%); with farming being only source of income

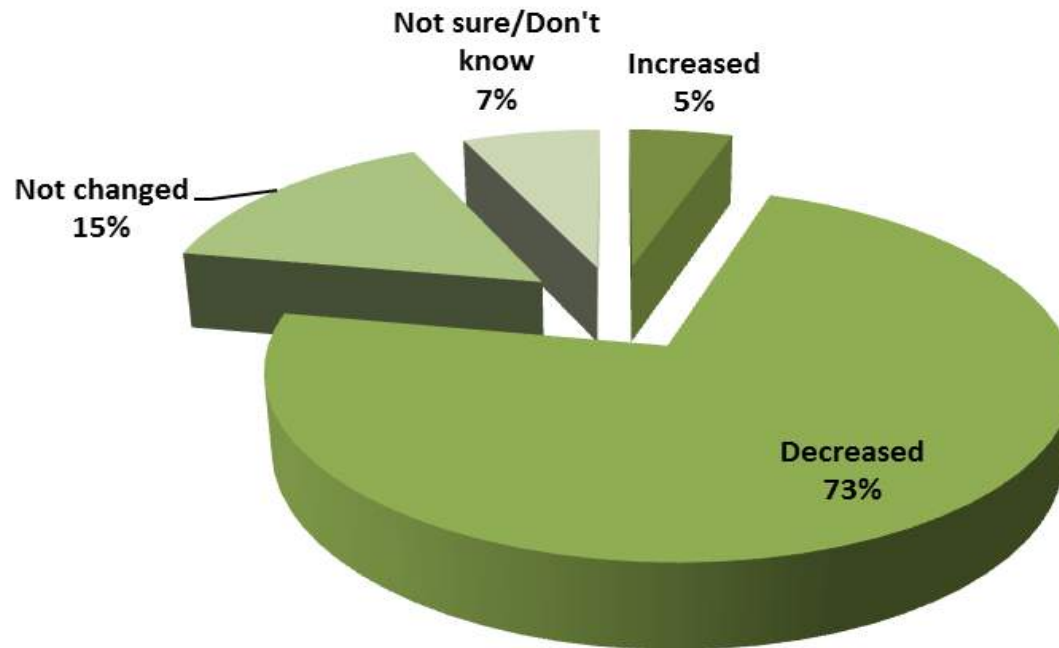
## Findings – Socio-demographic characteristics

- Most of the farmers surveyed (92%) had no formal training in agriculture.
- Participation in farmers' organizations was very rare (<25%). This can pose a challenge to both technology and knowledge transfer.
- Most of the respondents have been involved in farming for at least 20 years (mean = 28.2 years)
- The maximum number of years recorded was 65 years compared to a minimum of only 2 years.



- A fairly high degree of fragmentation observed; yet, large number of farmers (amounting to 44%) still recorded having only one farm plot.
- mostly small scale farmers, operating on properties less than 2 acres in size. It's important to note, that just under a quarter of the respondents (24.1%) were operating on 1 acre or less.

# Findings – Farmers' Perception of Climate Change



## Perceived changes in rainfall

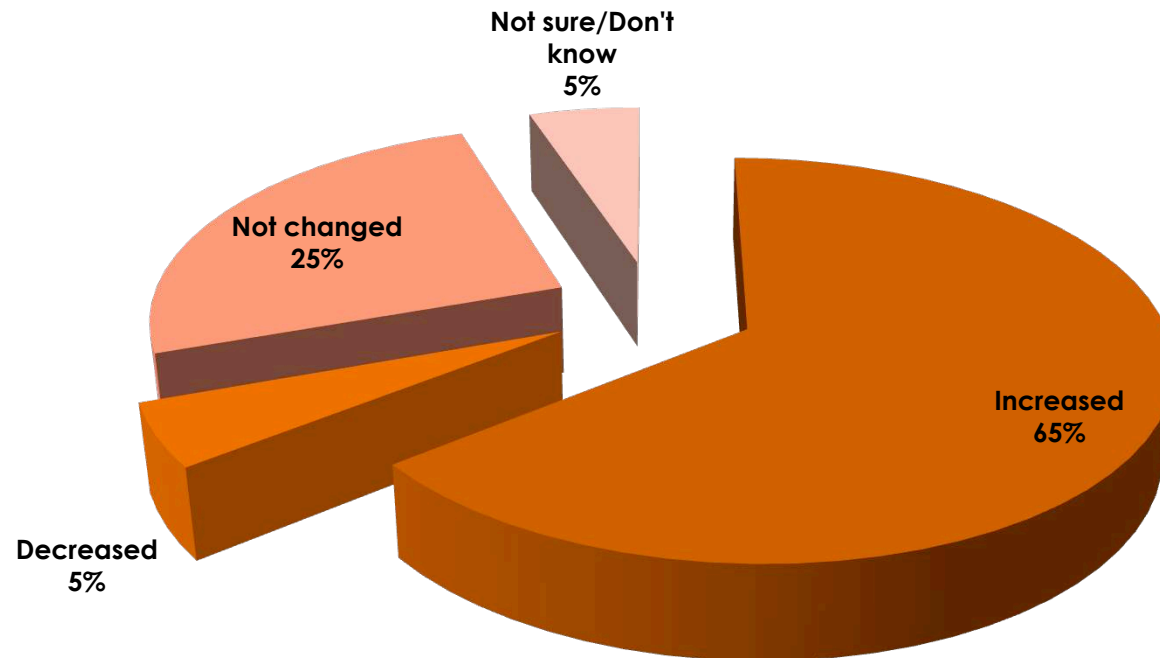
- Most farmers (around 78%) reported observing changes in rainfall patterns over the last twenty (20) years.



## Findings – Farmers' Perception of Climate Change

- An even greater number of respondents (84.7%) indicated experiencing changes in the timing of the traditional rainy season
- In terms of adjustments, less than one-half (49%) of the respondents have made adjustments on their farms in response to the observed changes.
- include practices such as:
  - mulching,
  - increasing the application of certain inputs such as fertilizers (very costly though), and
  - employing a range of on-farm irrigation and water storage practices.

# Findings – Farmers' Perception of Climate Change



## Perceived changes in temperature

- Approximately **70%** of the farmers surveyed indicated that they have observed a noticeable change in mean temperature over the last twenty years.

- Around 44 percent of respondents indicated that they have made adjustments on their farm in response to the observed changes in temperature.
- A common coping practice among farmers is increasing the amount of water normally applied to plants.
- Approximately 70% of the farmers reported observing a change in the dry season. The bulk of farmers pointed out that the dry season has extended in recent years.

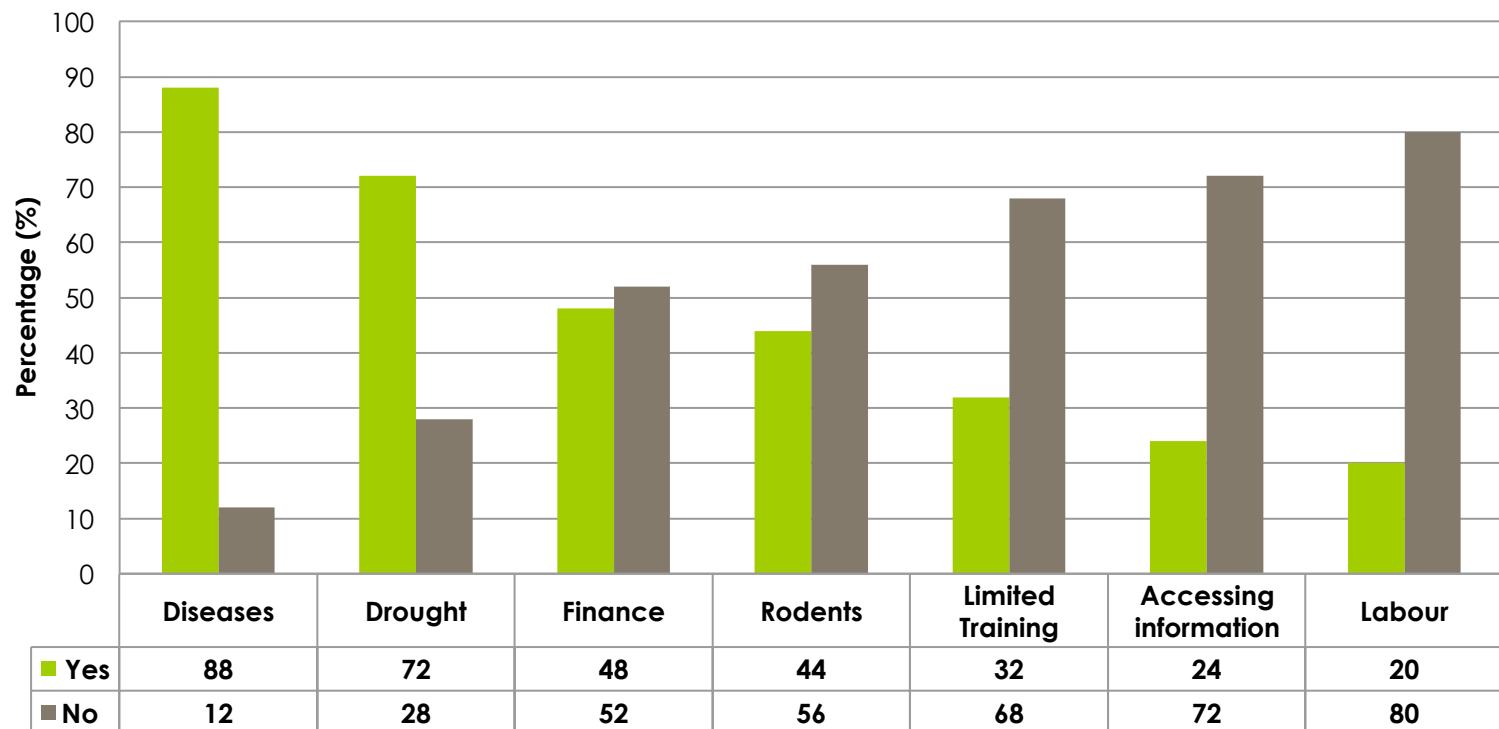
## Findings – Case Report on Cocoa Farmers

- Surveys were conducted in Trout Hall and Trout Hall Pass, Clarendon.
- Approximately 42% of the total farmers surveyed were cocoa farmers; The vast majority of whom considered cocoa to be their main crop.
- The bulk of these farmers have been cultivating cocoa for 20 years and over. One farmer reported being a cocoa farmer for 58 years.
- In terms of the terrain, the majority of cocoa farms were located on either slightly sloping land (68%) or on steep hillsides (24%).

- **Soil type:** the majority of farms are characterized by loam (60%) or clayey-loam (24%) soil.
- The bulk of farmers sourced their cocoa seeds from their farms (This amounted to as much as 84% of farmers), while only 8% reported sourcing seeds from nurseries.
- **Irrigation:** as much as 88% of the farmers indicated that they had no form of irrigation on their farm.
- The few farmers that had some form of irrigation used either a sprinkler system or surface/pond irrigation.

- **Challenges:** As much as 96% of the cocoa farmers indicated that they are not satisfied with the performance of current cocoa varieties.

### Main Production Challenges - Cocoa







Farmer showing black  
pod disease on cocoa







**'Road' to Trout Hall Pass Community**



- Farmers perception of the ability of existing cocoa varieties to cope with harsher growing conditions were mixed
- Only approx. 56% of cocoa farmers believe current varieties would cope well under drier conditions; While as much as 84% of cocoa farmers believe current varieties would cope well under warmer conditions
- Only 52% of the farmers surveyed indicated an interest in trying out new cocoa varieties
- **Important:** Farmers were generally unaware of the cocoa variety they were planting

## Findings – Case Report on Tomato Farmers

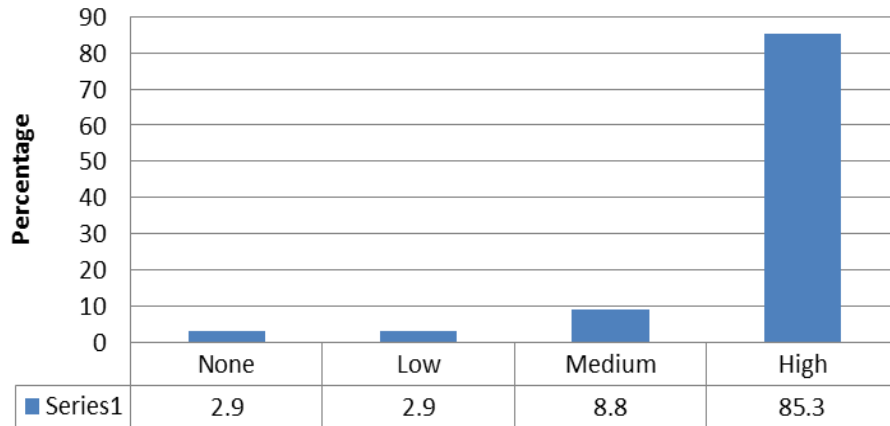
- Surveys were conducted in Southfield, St. Elizabeth
- Approximately 58% of the total farmers surveyed were tomato farmers; The vast majority (88%) of whom considered tomato to be their main crop.
- The majority of tomato seeds are sourced from farm stores (91%) located across the island
- The vast majority of farmers have been cultivating tomato for over ten years. One farmer reported being a cocoa farmer for 65 years.

- There are **no specific season** for planting tomato; grown year round as a cash crop; when asked if different varieties are used for dry versus wet season, 82% of the farmers said no
- **Irrigation:** as much as 65% of the farmers indicated that they had no form of irrigation on their farm.
- The few farmers that had some form of irrigation used either surface or drip irrigation.
- The large majority (92%) of tomato farmers seem to be satisfied with the performance of current varieties; Yet, 82% of the farmers expressed an interest in trying new tomato varieties

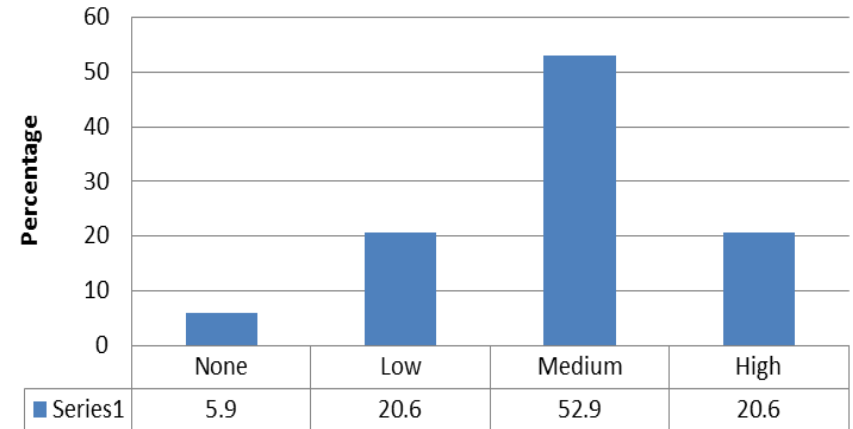
- Varieties less suited for dry conditions were:  
**'Plummy', Red Master, DR11, Hamza, Rio Grande, Striker, Gold Brown, Taranus, Salad**
- Varieties less suited for wet conditions were:  
**'Plummy', DR11, Hamza, Taranus, Red master, Striker, UC82, Jim Pride, Rio Grande**
- As much as 91% of the farmers indicated that their crops have been affected by disease in the past; 62% have experienced at least one major crop failure in the last 10 years

# ○ Threats: Several major threats were identified

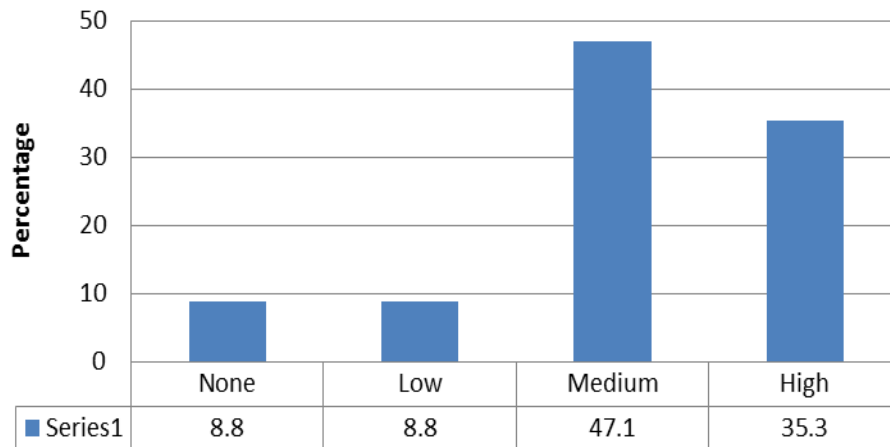
## Farmers' Ranking of Hurricane Threats



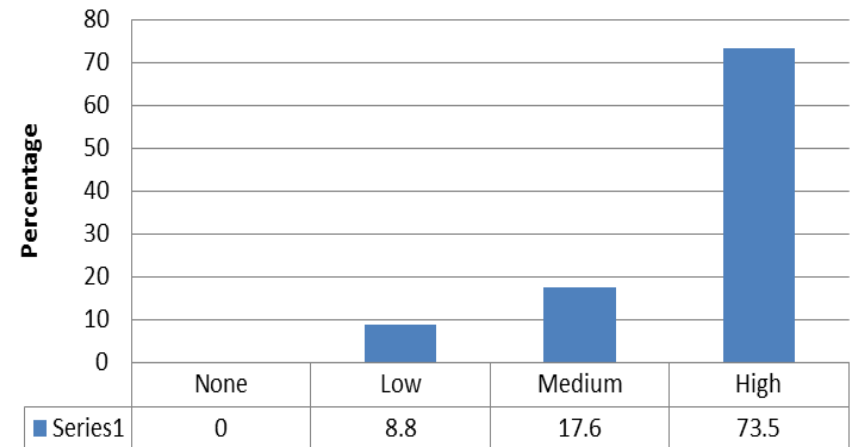
## Farmers' Ranking of Market-related Threats



## Farmers' Ranking of Pest/Disease Threats

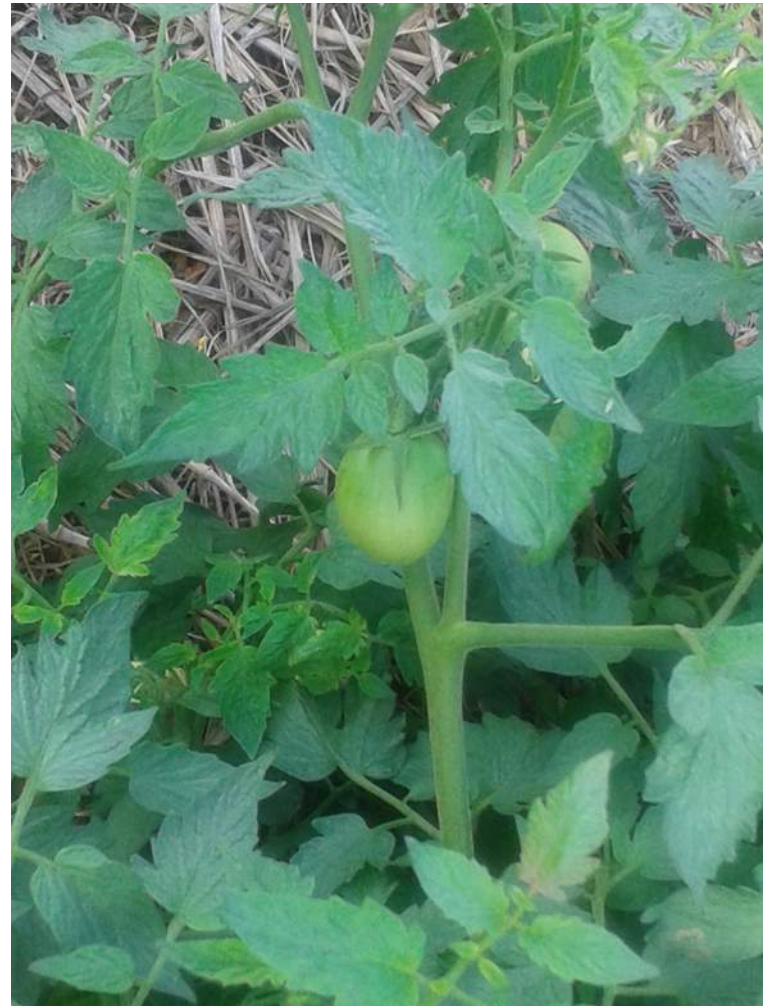


## Farmers' Ranking of Drought-related Threats





One of the many “Salad” varieties of tomato; large in size and round; usually fetches a higher price.



One of the many “Plumy” varieties of tomato; small in size and elongated; market ready due to their convenient size.





Tomato plant grown along side cords so as to avoid the fruit touching the ground. This limits the intensity in which diseases attacks the plant and fruit.



Water-filled drums on farm to water crops







“Crugging”: One of the most common diseases acknowledged by farmers, leaves become shrivelled and cannot produce any fruit. Occurs in both wet and dry seasons.

Another common disease is the “Green Chink”.



“Black Bottom Disease”



Unidentified disease

## Key Conclusions and Next Steps

- There seems to be a clear case for advancing this sort of research
- A lot of the issues facing farmers are driven or influenced by climate
- The human/management component is equally important
- **Next Step:** Field assessments with actual farmers with the resistant varieties identified from project

# Acknowledgements

- CaribSave Partnership
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