



# **CTA-Wageningen UR ACP/EU Think Tank Pre-Conference Event**

**Partnerships for Research, Capacity Building, Innovation and Foresighting:**

***Managing Water for Agriculture and Food in ACP Countries***

**28 October 2012  
Punta del Este, Uruguay**

In collaboration with





# CTA/WUR GCARD2 Pre-Conference Meeting

28 October, 2012

Venue: Rio de Janeiro a, CONRAD PUNTA DEL ESTE RESORT & CASINO



*Theme: Partnerships for Research, Capacity building, Innovation and Foresighting:  
Managing Water for Agriculture and Food in ACP countries*

## Innovative On-farm Water Management for increased Food Production in Jamaica,

by

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# Introduction

## The importance of rainfall to agriculture in the Caribbean

- Small farmer agricultural production systems in the Caribbean are predominantly dependent on rainfall
- Climate models are predicting a 30-40% decrease in rainfall by 2050 as a result of climate change
- Drying will be most significant between May and November, when the region is normally at its wettest.
- Declines in precipitation will likely lead to an increase in the risk of periods of drought for the Caribbean region.
- Drought will likely become more frequent and be more severe.
- Improved on-farm water management is therefore critical to the survival of agriculture in the Region.



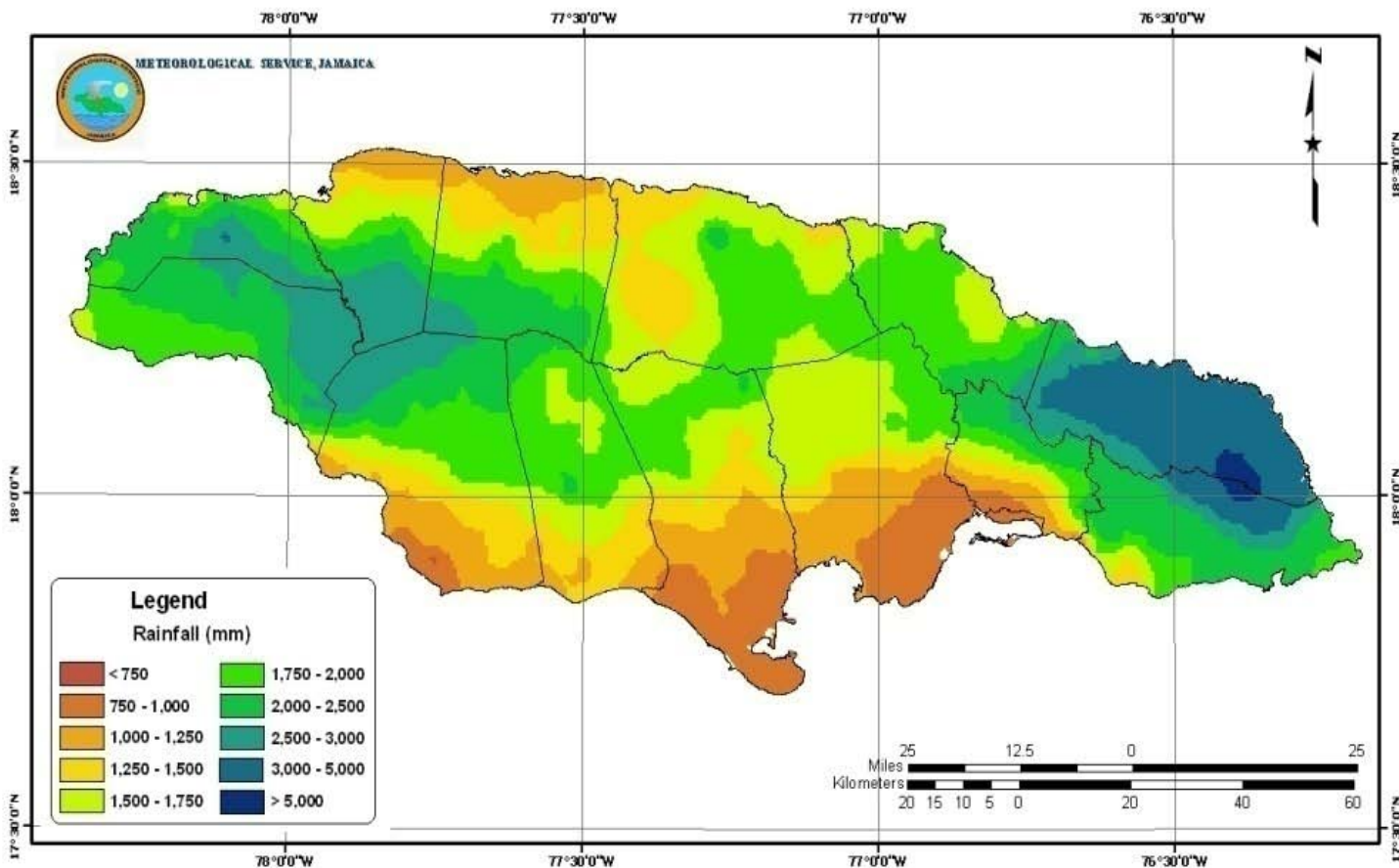
# Flagaman District, South St Elizabeth

- Flagaman district, in Southern St Elizabeth lies in the rain shadow area of Jamaica.
- The Northeast Trade Winds deposit their moisture in the mountainous interior, so are dry when they reach the south of the island.
- Farmers produce a range of high-valued cash crops including water melons, thyme, scallion, tomato and sweet peppers



# Rainfall in Jamaica

Jamaica: Distribution of Mean Rainfall (1951- 1980)





# Historic prospective of water management system

## First Phase

- The community has been cultivating crops for over 100 years.
- Traditional slash & burn methods of cultivation was used.
- In the early days:
  - water was drawn from the house tank,
  - transported to the field to fill a 200 litre drum, and
  - placed at the root of every plant in the field using a watering can.
- This system was time consuming and laborious.



# Historic prospective of water management system

## Second Phase

- After a number of crop failures in the 1970s, dry farming techniques were included in the system
- Guinea grass (*Panicum maximum*) was used to cover the soil before planting,
- There was less evaporation from the soil which drastically reduced the water required.
- The laborious process of applying water to each plant was still practised
- The advantages of dry farm techniques were:
  - Reduced soil temperature
  - Increase water conservation and soil moisture
  - Increased nutrient availability
  - Less water required by the farmer
- Disadvantage:
  - Harmful insects and other pest may inhabit the grass mulch





# Historic prospective of water management system

## Third Phase

- The Jamaican government introduced gravity drip irrigation across the country in 2003.
- In Flagaman the system consisted of:
  - Elevated platform with water storage tank
  - Header pipes which carry water to field
  - Drip tubes which distribute water to plant root
  - Water truck to provide the water supply
- The advantages of this system were:
  - Watering was less laborious and time consuming
  - Larger areas could be cultivated
  - Farmer has more time
- Disadvantage:
  - Required the purchase of water, to supplement harvested rainfall at an unsustainable cost of about US\$100 for 4,000 gallons.





# Historic prospective of water management system

## •Fourth Phase

- In 2009, the FAO Small Scale Irrigation and Rainwater Harvesting Project initiated this phase
  - The solution to the high water cost was the construction/rehabilitation of water harvesting and storage systems .
  - The capital cost was about US\$3,000 for a 250m<sup>3</sup> concrete water tank and a 405 m<sup>2</sup> concrete catchment area.
  - The savings from not having to purchase trucked water quickly compensated for this relatively high cost.
  - Filled twice a year during the rainy seasons, the system is able to support two crops on 1.2 hectares.



# Historic prospective of water management system

## Fourth Phase (cont)

- Initially, water from the tank was pumped to the field using a diesel pump, but with increasing fuel prices, this became a serious constraint.
- FAO provided solar pumps to convey water from the storage tank to the drip system
- The advantages of the solar pump were:
  - Lower energy cost
  - Reduced manual labour for irrigation



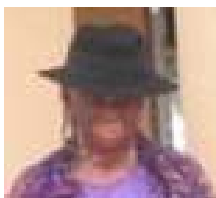


# Results of the Innovations

- These innovations have resulted in:
  - a more reliable and sustainable crop production system,
  - higher yields,
  - more efficient use of water and energy, and
  - a better standard of living for members of the Community







## Farmer testimony.....

- One farmer, Mrs. Mernel Ebanks estimates that with successive improvements in irrigation and water management her yields have increased fourfold in the last 50 years, and there is less risk of crop failure.
- For example, a cantaloupe plot, which yielded about 12,000kg per hectare less than ten years ago, now produces 38,000kg.
- She revealed "With the increased yields obtained over the last two years I have been able to renovate my house and I now have my kitchen and bathroom facilities inside the house."



# Partnerships for project execution

- The partnership among the International (FAO) regional, national and local farmers supported project success through:
  - Analysis of the Problem (FAO feasibility study including farmers' survey)
  - Agreement on the intervention strategy – All stakeholders
  - Adoption by local communities – NIC/RADA/Farmers
  - Extension to wide communities in Jamaica and the Caribbean – Training exercises CARDI/GWP-C/CEHI



# Up-scaling to other communities

## RWH Project in Lititz, St. Elizabeth

- Lititz is a community in South St Elizabeth which is similar to Flagaman.
- With support from the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP) and
- In collaboration RADA, NIC and the Forestry Department
- The project will support improved land management through training and the rehabilitation of a community Rainwater Harvesting (RVWH) facility at Lititz.
- This 6 million gallon capacity rain water catchment tank will permit the farmers to irrigate two (2) hectares of vegetables they grow.





# Up-scaling to other communities

## Adaptation Fund Programme

- The Adaptation Fund of the United Nations Framework Convention on Climate Change (UNFCCC) finances concrete adaptation projects and programmes in developing country which are Parties to the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change.
- Under the Adaptation Fund, Jamaica has gotten approval for a US\$10 M programme entitled "Enhancing the Resilience of the Agriculture Sector and Coastal Areas to Protect Livelihoods and Improve Food Security."
- Under this programme, rainwater harvesting and drip irrigation systems will be implemented in six parishes.



# Up-scaling to other communities

## Adaptation Fund Programme (cont)

- The six Parishes targeted are Trelawny, St. Mary, St. Ann, St. Catherine, St. Thomas and Clarendon.
- The specific intervention/activities include:
  - establishment of approximately 40 rainwater harvesting systems in selected farming communities; and
  - establishment of approximately 60 small-scale gravity drip irrigation systems.





# Out-scaling to the Caribbean

## Caribbean Environmental Health Institute (CEHI) initiatives

- The United Nations Environment Programme (UNEP) embarked on a global effort to promote the use of sustainable water resources, with its focus being RWH.
- The Caribbean Environmental Health Institute (CEHI) is among the lead regional agencies advancing the promotion of RWH initiatives in the Caribbean region.
- With the assistance of UNEP, and in consultation with partner regional and national agencies, CEHI developed a Regional Programme for the Promotion for RWH in the Caribbean.
- The programme focuses on:
  - building awareness,
  - promotion of training and skills-enhancement and
  - investment in appropriate infrastructure to support RWH.

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# Out-scaling to the Caribbean

## Water Harvesting Toolbox

- A Water Harvesting Toolbox was developed with grant funding from the Perez Guerrero Trust Fund for Economic and Technical Cooperation (PGTF) to the Caribbean Council for Science and Technology (CCST) on behalf of the Global Water Partnership-Caribbean
- The Toolbox consist of literature, information and interactive media products to support the promotion of the practice of Rainwater Harvesting (RWH) in the Caribbean
- The Toolbox is available at:

<http://www.cehi.org.lc/Rain/Rainwater%20Harvesting%20Toolbox/index2.htm>



# Key Messages

1. Rainwater harvesting combined with drip irrigation can contribute to a successful, efficient on-farm water management system for small holder farmers.
2. Local, national, regional and international organisations can successfully partner to develop and execute an integrated water management programme that benefits rural communities.
3. The approach and technology can be scaled up to benefit other communities and areas.





# Thank You and God Bless



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