The Caribbean Agrometeorological Initiative (CAMI): Raising Farming Productivity

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Roadmap

• The CAMI Network.
• Importance of Caribbean agriculture.
• Methodological considerations:
  – What would we like to know about CAMI?
  – What can you learn from two short visits?
• From Met Services to Farming Decisions: The Logic Model.
• Why physical geography matters for CAMI.
• Economic incentives for technology adoption.
CAMI: 2010-2012

• Funded by the European Union under the African, Caribbean and Pacific Group of States Science and Technology Programme.

• “The overarching objective is to increase and sustain agricultural productivity at the farm level in the Caribbean region through improved applications of weather and climate information using an integrated and coordinated approach.”

• Antigua & Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Lucia, St. Vincent & the Grenadines, Trinidad & Tobago.
Agriculture in the CAMI Countries

Agricultural Contribution to GDP and Workforce in CAMI Countries
(U.S. CIA, 2012)

Country

Percent

GDP
Workforce

Antigua and Barbuda 2.3% 7.0% 3.1% 10.0% 13.0% 10.2% 13.6% 40.0% 5.4% 11.0% 20.0% 6.4% 17.0% 21.7% 26.0% 0.3% 3.8%
Agriculture in the CAMI Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Top Agricultural Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua and Barbuda</td>
<td>Cotton, fruits, vegetables</td>
</tr>
<tr>
<td>Barbados</td>
<td>Sugarcane, vegetables, cotton</td>
</tr>
<tr>
<td>Belize</td>
<td>Bananas, cacao, citrus</td>
</tr>
<tr>
<td>Dominica</td>
<td>Bananas, citrus, mangos</td>
</tr>
<tr>
<td>Grenada</td>
<td>Bananas, cocoa, nutmeg</td>
</tr>
<tr>
<td>Guyana</td>
<td>Sugarcane, rice, edible oils</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Sugarcane, bananas, coffee</td>
</tr>
<tr>
<td>Saint Lucia</td>
<td>Bananas, coconuts, vegetables</td>
</tr>
<tr>
<td>Saint Vincent and the Grenadines</td>
<td>Bananas, coconuts, sweet potatoes</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>Cocoa, rice, citrus</td>
</tr>
</tbody>
</table>

(U.S. CIA, 2012)
Guiding Questions

• As a result of CAMI, do Met. and Ag. agencies have the capacity to produce and distribute accurate information?
• How are Met. and Ag. agencies gauging farmer’s information needs?
• How are Met. and Ag. agencies tailoring information to meet the information needs of farmers?
• Do farmers have access to new or better climate information as a result of the project?
• Are farmers able to act on the information provided?
  – Do they understand the information?
  – Do they have the resources to act?
Activities conducted by CAMI

**Activities**
- Data Rescue
- Rainy season modeling
- Communication workshop
- Pest and disease modeling
- Farmer forums
- Crop simulation

**Stakeholders**
- CAMI staff
- Meteorological agencies
- Agricultural agencies
- Farmers
Caribbean Basin Rainfall Outlook for OND 20123

Figure 1. Seasonal rainfall outlook created by CIMH for Oct- Dec 2013. 
http://www.cimh.edu.bb/?p=precipoutlook
Agricultural information included in the August 2013 outlook bulletin for Barbados.

Recommendations for the Period

**Livestock**
Fertilize your pastures before the next set of heavy rains. This is also a good time to seed your pastures with seeds of legume vines. They should grow quickly with the moisture available. This will improve the quality of your pastures during the dry period.
Plant deep rooted legumes like Leucaena (wild tamarind) and gliricidia around your pastures. This will provide some high protein forage during the dry period to help boost production.

**Vegetables**
The high humidity experienced during August may have caused some problems with fruit set of your tomatoes and sweet peppers. Chances are you will also have some problems with the mildews on squash.

**Snails**
The snails have not gone away! The rains have seen a resurgence of this pest, so be on the lookout and bait areas of high prevalence. If you know of an area where lots of small ones are use the liquid metaldehyde. This gives a good kill of the young snails and reduce your future numbers.

**Water Capture**
With the high rainfall of August you should have had a good chance to look over your land space and see where are the best places to locate water catchment areas. Remember now may not be the time to start work but it sure is a good time to make some decisions of what and where to site such a facility.
Example of meteorological information included in the August 2013 outlook bulletin for St. Vincent and the Grenadines.

**National Rainfall Outlook**
Normal to above normal (243mm-280mm)
September – October – November... 50% chance above normal...
30% chance normal

**Temperature Outlook**
2m Air Temperature... above normal
Sea Surface Temperature... above normal
Example of meteorological information included in the May 2013 outlook bulletin for Antigua and Barbuda.
What Would We Like to Know about CAMI?

• How many growers are using national meteorological, climatological, and hydrologic (NMCH) services?
  – What sort of decisions?
  – What would they like to know?
  – How do they get NMCH information?

• How has CAMI enhanced access to NMCH services?

• Are NMCH services making a difference?
  – Productivity
  – Production Costs
  – Incomes

• Will the improvements last after CAMI?

• How does the CAMI experience vary by nation?

• What can CAMI tell us about climate services elsewhere?
What Can You Learn from Short Visits to Two Caribbean Island Nations?

• Detailed information from a handful of interviewees:
  – Institutional missions and strategies.
  – Local resource conditions.
  – Domestic and international markets.
  – Local agricultural technology.
  – The role of climate and weather.

• What you cannot learn is the prevalence of these views and experiences, *even within that nation*.

• But, attempting a survey before the personal interviews would be, at best, a waste of time.
  – You would ask the wrong questions.
  – You might alienate your research partners and subjects.
Methodology

• Used CSP 2013 draft protocol for “mid-level” evaluations.

• Used Tall & Njinga 2013 Kaffrine, Senegal report
  – “Developing an effective M&E [monitoring and evaluation] framework for the impact of climate services on farmer livelihoods requires local specificity.”
  – “Only after an in-depth investigation into farmers’ decision-making contexts...can an apt evaluation protocol be developed and the impact of climate services be studied.”
Methodology part 2

• 2-stage research approach
  – Develop theory of change and logic model
  – In country data gathering

• Review program materials

• Site visits and interviews
  – CIMH
  – Barbados Met, Ag, farmers
  – Dominica Met, Ag, farmers

• Potential phone/in-person interviews
  – Jamaica
  – Guyana
  – Grenada
What Did We Learn?

• Barbados and Dominica are different. Indeed, Caribbean nations differ quite a bit from each other.
  – Barbados has nearly four times as many people (265,000) as Dominica (70,000), even though it is slightly smaller.
  – In percentage terms, agriculture is a smaller portion of the economy in Barbados, which in addition to tourism also has light manufacturing.

• But commonalities exist, as well. Most farmers in the CAMI countries have small plots of land where the work must be done by hand.
  – Topography
  – Urbanization

• The farmers we spoke with in Barbados worked 25-30 acres of land.

• The farmers we spoke with in Dominica, a much more mountainous island, worked between ½ and 17 acres.

• Technological leaders in each country are taking advantage of climate services, but more extensive take up will require more time.

• Economic theory of technology adoption: Small production scale and lack of access to international markets act to deter technology adoption, e.g., use of climate services.
Geography Does Matter for CAMI

• What Barbados, Dominica and most CAMI nations have in common is that they are small island nations in the Caribbean basin, which is home to the largest number of these nations in the world.

• Small island nations face a number of economic challenges.
  – First, by virtue of their size, the provision of meteorological or agricultural services is expensive.
  – Second, the small sizes of their domestic markets make it difficult to attract the foreign investment necessary to compete globally.
  – Third, their limited size and the consequent difficulty in diversification can leave them quite vulnerable to natural disasters, political events and business cycles.

• In other settings where small neighboring nations must cooperate if they are to provide climate services, CAMI does offer lessons.
  – Regional leadership, a common language, and a history of cooperation are probably necessities.
  – Differences in politics and physical geography will mean that each individual nation will likely have to downscale both climate information and appropriate ways that decision makers can respond.
Domestic Markets imply inelastic demand and elastic supply.
International Markets: Greater Demand that is also Price Sensitive

Short-term Supply Curve faced by the innovative grower, who is able to attain producer surplus.
Preliminary Results

- Most Met. and Ag. agencies have the capacity to produce and distribute accurate information
  - CAMI has increased some of agencies’ capacities
- Met. and Ag. agencies are continuing to develop and improve the content of outlook bulletins distributed at national and regional levels
- Distribution of the outlook bulletins is a significant challenge
- There is a desire for seasonal outlook forecasts among farmers
- Some farmers have chosen to change their practices based on the information
The Caribbean Agrometeorological Initiative (CAMI): Lessons Learned

• Evaluating a 10-nation network for climate services presents a number of challenges.

• We agree with Tall and Njinga on the importance of local specificity.

• Mid-term impact of climate services is evident in the extensive of cooperation between national agricultural and met services and the CIMH.
  – Met Services and the Ag Ministries now talk, we were often told, in each country; they didn’t before.

• Important intermediate steps.
  – CAMI’s the distribution of outlooks bulletins,
  – the utility of the information in the outlook bulletin to farmers, and
  – some farmers have chosen to change their practices based on the information provided by CAMI.

• In developing a regional network of climate services, capacity building is a crucial indicator of success.