Innovations in the approach to food and nutrition Security in CARICOM: Linking agriculture and nutrition to improve the health of the region’s populations

Leroy E. Phillip

Faculty of Agricultural and Environmental Sciences,
McGill University, Montreal, Canada
Project Profile

• $5 M CAD CIFSRF funding over 42 mo (March 2011-Aug 2014)
• 3 Academic Institutions (UWI, UG, McGill)
• 10 Institutional CARICOM Partners
• 200 Field personal trained
• 45 Farmers
• 30 Researchers
• 25 Field staff,
• 21 Grad students & Research Assistants
• Improve nutrition & health outcomes of CARICOM populations through availability of foods that would increase intake of vegetables and fruits, decrease caloric intake, and increase micronutrient intake;

• Develop food production systems based on agricultural diversification, water conservation & efficient use of land;

• Increase the rate of technology adoption by small farmers;

• Adapt international standards of food safety and quality for a healthy, market-oriented food supply chain;

• Build and test a Farm to Fork Model for CARICOM food and nutrition security;

• Expand and build human and institutional capacity to solve problems of food and nutrition insecurity in CARICOM;
Obesity Trends in CARICOM

- Male
- Female

Year:
- 1970's
- 1980's
- 1990's

Prevalence (%)
- Source: CFNI
From Farm

Socio-Economic Studies
- Consumer and Farmer Household Surveys
- Focus groups on innovation & technology adoption

Market access
- Post-Harvest Loss Management
- Food Safety and Quality

To Fork

Water and Land Resources
- Drip Irrigation, Water and Soil Conservation
- Protected Agriculture
- Open Field Crop Diversification
- Silage conservation for Small Ruminants

Environmental Management

Gender Consideration

Community Nutrition and Health
- Improving the quality of School Meals
- Nutrition Education
- Consumer food choices

Policy Changes for Sustained Food Security in CARICOM

...and beyond

Farm to Fork: Impact pathway
Overall Goal: Improving nutrition and health of CARICOM population through sustainable agricultural technologies that increase food availability and diversity of food choices

EXPECTED OUTCOMES

Increased year-round supply and diversity of fruits and vegetables

Adoption of good agricultural practices for food safety and quality

To influence policy makers on food and nutrition security policy

Healthy changes in body mass index and diet diversity through increased intake of fruits and vegetables

Development of a sustainable “farm to fork” model for CARICOM food and nutrition security
Fruits (Caribbean food group)

Vegetables (Caribbean food group)

The Challenge: Fruits & vegetables

<table>
<thead>
<tr>
<th></th>
<th>SKN</th>
<th>TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td>1.34</td>
<td>1.03</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.6</td>
<td>0.8</td>
</tr>
</tbody>
</table>
BMI of subjects in St. Kitts

BMI of Caregivers of school children

<table>
<thead>
<tr>
<th>Percent</th>
<th>&lt;18.5</th>
<th>18.5-25</th>
<th>25-30</th>
<th>≥30</th>
</tr>
</thead>
</table>

Children: Height and BMI for Age

<table>
<thead>
<tr>
<th>Percent</th>
<th>&lt;-2</th>
<th>-2 to -1</th>
<th>-1 to 0</th>
<th>0 to 1</th>
<th>1 to 2</th>
<th>&gt;2</th>
</tr>
</thead>
</table>

- Blue: Height for Age
- Red: BMI for Age
Before
- Rice and beans, turkey wings, Noodles/ground meat
- Hot dogs
- Chicken soup with pumpkin and dumplings
- Cheese sandwich
- Sugar drink

After
- String beans, carrots
- Tomatoes, cucumbers
- Sweet potato, pumpkin
- Melon, green banana
- Mutton

Number of children impacted by menu change

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Number of meals served daily (national level)</td>
<td>3,200 (17 schools)</td>
</tr>
<tr>
<td>Number of modified meals served daily (project level)</td>
<td>800 (4 test schools)</td>
</tr>
<tr>
<td>Number of children evaluated</td>
<td>188 (4 + 3 control)</td>
</tr>
</tbody>
</table>
Local farm products for school lunch in St Kitts (Jan – June 2013)

<table>
<thead>
<tr>
<th>Food Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roots</td>
<td>41</td>
</tr>
<tr>
<td>Vegetables</td>
<td>28</td>
</tr>
<tr>
<td>Pulses</td>
<td>17</td>
</tr>
<tr>
<td>Fruits</td>
<td>20</td>
</tr>
<tr>
<td>Mutton</td>
<td>4</td>
</tr>
</tbody>
</table>
Improvements to lunch menu

- Watermelon, carrots, pumpkin, tomatoes, cucumber, string beans
- Better quality meat and more frequently

Implications of menu change

- New menu costs 70% more (mainly due to better meat cuts rather than fruits and vegetables)
- Savings could be achieved by reducing sugar drink (29% of food budget)

What is required?

- Develop feeding standards for the school lunch
- Ensure a Steady Supply of produce for the school meals
- Strengthen coordination between school feeding program and small holder farmers
Drip + mulching

Mulato grass conservation for small ruminants

Drip irrigation

Protected agriculture

Post-harvest loss measurement (Penetrometer)
### 2012/2013 Crop yield at St. Kitts project sites

<table>
<thead>
<tr>
<th>Crop</th>
<th>Not Irrigated</th>
<th>Irrigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>String Beans (Mansion)</td>
<td>2.80</td>
<td>5.87</td>
</tr>
<tr>
<td>Pumpkin (Stapleton)</td>
<td>0.81</td>
<td>6.88</td>
</tr>
<tr>
<td>Watermelon (Stapleton)</td>
<td>1.04</td>
<td>1.81</td>
</tr>
</tbody>
</table>

### 2012 Crop yield at Black Bush Polder (Guyana) project site

<table>
<thead>
<tr>
<th>Crop</th>
<th>Not irrigated</th>
<th>Irrigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>17.1</td>
<td>18.5</td>
</tr>
<tr>
<td>Red beans</td>
<td>1.8</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Greenhouse crop production
Achievement: Increased crop availability and diversity
Achievement: Post-harvest Losses Mapping for process control

- **SUBSISTENCE FARMERS** (limited farming experience)
  - 16 - 30% Loss
  - Inappropriate on-farm storage and handling and limited markets

- **COMMERCIAL FARMERS** (advanced farming experience)
  - 5 - 20% Loss
  - Limited markets

- **RETAILERS** (Street Markets)
  - 27 - 38% Loss
  - Non-refrigerated storage Environmental factors (T, Light, RH)

- **RETAILERS** (Supermarkets)
  - 5 - 17% Loss
  - Refrigerated storage Do not meet the supermarket standards

- **REGULAR CONSUMERS**
  - 1 - 5% Loss

- **SCHOOL MEAL CENTER** (Consumers: Children)
Drought tolerant Mulato grass and sorghum for small ruminants
Mulato grass establishment in St. Kitts

Area covered %

- mulato grass
- dry material and weeds
- bare soil
Mulato Forage Biomass production

Jul.2012 (12 weeks, dry season) - 4.78 Tons/ha
Aug.2012 (3.5 weeks, wet season) - 10.18 Tons/ha
Silage production for small ruminants
Small ruminant performance with Mulato grass silage on farms in St. Kitts

Daily gain (96 d after weaning) of sheep supplemented with Mulato grass silage in St. Kitts.

- Control (natural pasture): 49 g/day
- Natural pasture + Mulato grass silage: 57 g/day
Water sampling

Soil sampling

Laboratory analysis

Training and field measurements

Food Safety training
Innovation: Farmer social network analysis in St. Lucia

Analysis of social network to understand social capital and knowledge flows among farming communities.

- Strong evidence of social learning among farming communities
- Differences in “relationship ties” linked to innovation and change
• CIFSRF CARICOM project: first regional **Integrated, multi-sectoral, multidisciplinary** food security project linking agriculture to nutrition and health outcomes to combat obesity;

• Provides a new body of **integrated scientific findings** to address the binding constraints outlined in the Jagdeo initiative and the concerns of the Caribbean Commission on Health and Development regarding CNCD’s;

• Lays the ground work for “scale up initiatives” to utilize **school feeding** programs as **“vehicles for change”** for improving community nutrition & health, improving income & livelihoods of **small holder farmers**, and stimulating rural development

• The Project could serve as a useful model for “partnership building” to address issues of CARICOM Food and Nutrition security
• **School feeding** programs are underutilized vehicles for reversing the obesity trends in CARICOM while providing market opportunity for **small holder farmers**

• Findings from the Project could serve as a useful **farm to fork model** for regional application in CARICOM
Acknowledgements

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THANK YOU