Sustainable incomes through coffee farming improvement project

AKA

“The Starbucks Project”

Taya Brown

PhD Student, Horticultural Sciences
TAYA BROWN, PhD Student, Hort 202 TA

• **Education**
  – B.S. in Agricultural Food Systems, Organic Major, at Washington State University
    • Minors in Horticulture and Soil Sciences
  – B.S. in Plant Biology from Washington State University

• **Work experience**
  – 6 years Alm Hill Gardens Organic Farm
  – 4 years Apple, Pear, Cherry Orchard, WSU
  – TA in Hort 202 at TAMU since Aug. 2015
What I Do

• Motivations: Global Food Security, international travel, cross-cultural interaction

• Career Goals: M&E of International Agricultural Development Projects

• General Research Focus: Adoption and diffusion of innovation

• Specific Research Focus: Farmer Perceptions
Economic Importance

• 400 billion cups consumed per year
• United States: $20 billion annually
• Worldwide: $170 Billion annually
• Contributes up to 59% of export earnings of coffee producing countries (Ovalle et al., 2015)
Need for Research

- 8.5 million people in coffee industry in Latin America alone
- 25 million farmers produce (Ovalle et al., 2015)
- Of particular significance within indigenous populations (Baca et al., 2014)
Vulnerability

• Mainly grown in developing countries
• 80% supplied by farmers < 9 hectares
• 25 million smallholder farmers globally
• 8.2 metric tons of coffee on 1 million hectares of land
• Latin America: 8.5 million people in coffee alone
• Highly vulnerable to climate change and other stressors
“Malaria Belt”
“Conflict Belt”
“Coffee Belt”

![Diagram showing coffee belt regions around the world](image-url)

1. **Papua New Guinea**
   - Semi-sweet chocolate aroma, cocoa flavor with hints of cherry. Medium body, quick finish.

2. **Brazil**
   - Slightly spicy, nutty aroma, nutty base, caramel notes. Full body, clean finish.

3. **Sumatra**
   - Aroma of dried fruit and nuts. Full syrupy body, deeply sweet finish.

4. **Honduras**
   - Sweet molasses aroma and flavor. Full body and lingering sweet finish.

5. **Peru**
   - Bright, fruity aroma, lightly fruity flavor with a clean finish.

6. **Guatemala**
   - Sweet, tart aroma, lightly fruity flavor. Light body and clean finish.

7. **Colombia**
   - Nutty aroma, caramel flavor. Medium body and heavy finish.

8. **Ethiopia**
   - Rich blueberry aroma, cocoa and spice flavor. Medium body and clean finish.

**The best coffee comes from the best growing climates, known as The Bean Belt.**

Prime coffee-growing regions form a belt roughly bounded by the Tropics of Cancer and Capricorn. These areas offer perfect conditions for growing coffee beans.

Courtesy of Ohio State
Global Belts
Global Belts
Coffee Leaf Rust

- Obligate parasite fungus
- Attacks through stomatal openings on leaves
- Spores travel via wind and water
CLR epidemic, Guatemala 2012 – 2013

- Warmer, wetter weather (climate change)
- 276,000 Hectares (682,000 acres) affected
- Half owned by small farmers
- 70% of all plantations affected
CLR epidemic, Guatemala 2012 – 2013

- $1 billion in damages
- 35,000 households
- Loss of 60 Million workdays per year
- 2013: UN $4.6mil in disaster relief funds
The “Starbucks Project”

• Goal: Economic recovery of affected farms
• Technology: Rust resistant F1 Hybrid, “Centroamerica”
• Quantity: Sufficient to plant $\frac{1}{6}$ hectare
• Timeline: 2015 – June 2018
Target Farmers

• Selected by Anacafé
  – Regional CLR Damage
  – Income highly coffee dependent

• 6 Cooperatives
• 339 Farmers
• 1,700 Beneficiaries
Map of the level of incidence of CLR in Guatemala, with 1 (red color) indicating the most affected area and 5 (white) the least. The circle indicates the municipality of Yepocapa, in the Department of Chimaltenango, which is the location chosen for the Starbucks Project activities.
## Languages and Land Area

<table>
<thead>
<tr>
<th>Organization</th>
<th>Languages spoken</th>
<th>Members</th>
<th>Productive Area</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Total</td>
<td>Total Area (Mz)</td>
<td>Coffee Area (Mz)</td>
</tr>
<tr>
<td>ECA El Esfuerzo Chuachilil</td>
<td>Kaqchikel and Spanish</td>
<td>20</td>
<td>3</td>
<td>23</td>
<td>237</td>
<td>79</td>
</tr>
<tr>
<td>ECA Montellano</td>
<td>Kaqchikel, Mam, K'iche and Spanish</td>
<td>77</td>
<td>44</td>
<td>121</td>
<td>685</td>
<td>280</td>
</tr>
<tr>
<td>Maya Kiche Association</td>
<td>Kaqchikel, Mam, K'iche and Spanish</td>
<td>15</td>
<td>7</td>
<td>22</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>El Esfuerzo Chuachilil Association</td>
<td>Kaqchikel and Spanish</td>
<td>25</td>
<td>3</td>
<td>28</td>
<td>237</td>
<td>79</td>
</tr>
<tr>
<td>San Pedrana, R.L. Cooperative</td>
<td>Kaqchikel and Spanish</td>
<td>45</td>
<td>7</td>
<td>52</td>
<td>115</td>
<td>90</td>
</tr>
<tr>
<td>COFEAG, R.L. Cooperative</td>
<td>Kaqchikel and Spanish</td>
<td>46</td>
<td>9</td>
<td>55</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>226</strong></td>
<td><strong>73</strong></td>
<td><strong>299</strong></td>
<td><strong>1314</strong></td>
<td><strong>558</strong></td>
</tr>
</tbody>
</table>

\(^2\text{Mz = manzanas. Each manzana equals 1.7 acres or 6,967 m}^2\), or 0.6987 ha.

\(^\text{qq = quintales. Each quintal equals 100 lbs or 46 kg of parchment coffee}\)
# Farmer Training

<table>
<thead>
<tr>
<th>Training session topic</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology and culture of the coffee hybrids (for agents and technicians by Mr. Courtel)</td>
<td></td>
</tr>
<tr>
<td>Management of seed beds and nurseries (for farmers)</td>
<td></td>
</tr>
<tr>
<td>Renovating a coffee farm (for farmers)</td>
<td></td>
</tr>
<tr>
<td>Integrated managements of pests and diseases (for farmers)</td>
<td></td>
</tr>
<tr>
<td>Effective farm management (for farmers)</td>
<td></td>
</tr>
<tr>
<td>Coffee species and varieties (for farmers)</td>
<td></td>
</tr>
<tr>
<td>Day of the coffee farmers</td>
<td></td>
</tr>
</tbody>
</table>
Farmer Training
My Study

Methods

• Initial Focus Groups
• Local interviewers
• Baseline data/comparison group
• Two interview sets
• Hybrid integration assessment

Metrics

• Economic changes
• Food security
• Hybrid integration within existing system
• Hybrid health
Socioeconomic Instrument

World Coffee Research - Socio Economic Study

### A. Survey Quality Control

<table>
<thead>
<tr>
<th>Enumerator Code</th>
<th>Interview number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>

**GPS coordinates**

<table>
<thead>
<tr>
<th>N</th>
<th>E</th>
<th>Completed (code)</th>
<th>Anonymity</th>
</tr>
</thead>
</table>

### B. Respondents Personal Details

### C. Family Composition

#### DATA on Household Members - Social Data

<table>
<thead>
<tr>
<th>Family member #</th>
<th>Name [Last name?]</th>
<th>Relation to household head</th>
<th>Sex</th>
<th>Age</th>
<th>Marital status</th>
<th>Highest grade of schooling</th>
<th>Current Education Status</th>
<th>If [I] is between 6 and 15 years give main reason for not being in school</th>
<th>Literate</th>
</tr>
</thead>
</table>
Hypotheses

• The Centroamerica hybrid plantlets will grow faster, produce more, show resistance to CLR and show more overall health and vigor than current varieties.
Hypotheses

• Farmers that perceive themselves as more marginalized will make more ‘short-term’ decisions, as ways of coping, and less ‘long-term,’ more strategic decisions regarding the management of their farms and businesses.
Hypotheses

• These findings will correlate with data on farm size and history (e.g. farmers with more land and resources, and/or sustained less damage from CLR will perceive themselves as less marginalized), and other farm and farmer characteristics.
### Timeline

<table>
<thead>
<tr>
<th>Activity</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (Jan-Mar)</td>
<td>2 (Apr-Jun)</td>
<td>3 (Jul-Sep)</td>
</tr>
<tr>
<td>Project orientation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IRB Document Preparation</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Preliminary Literature Review</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Socioeconomic baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrument developed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain IRB approval</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First farmer interview (midline)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Literature Review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Integration Research Design</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Hybrid integration data collected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second farmer interview (end line)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Integration data analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer perceptions analysis</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Socioeconomic gains assessment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Conflict Questions

**Coffee as a Conflict Resistant Crop**

- Were you or your parents displaced after the civil war?
  - [ ] Yes
  - [ ] No

- If so, were your previous crops burned or destroyed during the war?
  - [ ] Yes
  - [ ] No
  - Which crops ____________________________

- In your community, is coffee a conflict-resistant crop because it cannot be eaten directly or traded easily?
  - [ ] Yes
  - [ ] No

### To what degree have the following conflicts affected your agricultural activities in the past two years?

<table>
<thead>
<tr>
<th>Conflict</th>
<th>Never</th>
<th>Occasionally</th>
<th>Very Often</th>
<th>Always</th>
<th>No Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theft (of coffee cherries, transplants)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Vandalism (chopping coffee trees for firewood, destroying trees)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Issues with sales contracts (farmers selling coffee for cash and ignoring signed contracts)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
La presente donación de Beneficio Húmedo de café, a la Asociación para el Desarrollo Rural Empresarial de Yepocapa (ADREY) ha sido financiada por el Proyecto AGTEC-Alimentos para el Progreso y el Departamento de Agricultura de Estados Unidos (USDA).

Aldea San Lucas Miramar, Yepocapa, Julio de 2012
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Aldea San Lucas Miramar, Yepocapa, Julio de 2012
Internship Report

Thank you!
Questions?
Prerequisites of pest damage or infection: (The Disease Triangle)

Three factors must be present for a pest to cause damage:

- **Plant**: Must be susceptible to infection or damage
- **Pest**: Must be present in sufficient numbers; biggest new problem is deer
- **Environment**: Must be conducive to the growth of the pest and unfavorable to the plant
Prerequisites of pest damage or infection: (The Disease Triangle)

- Plant: Must be susceptible to infection or damage
- Pest: Must be present in sufficient numbers; biggest new problem is deer
- Environment: Must be conducive to the growth of the pest and unfavorable to the plant

Climate Change

Plant susceptibility

Disease

Pest
Prerequisites of pest damage or infection: (The Disease Triangle)

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Diagram:
- Climate Change
- Plant susceptibility
- CLR

Disease
Prerequisites of pest damage or infection: (The Disease Triangle)

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