Development of High Value Sweetpotato Products Value Chain in Rwanda

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Rwanda Value Chain Project Branding
Background

- Sweetpotato is an important crop in Rwanda
  - Consumption and family income
  - Flexible crop because it requires low inputs
  - Piecemeal harvesting

- Production statistics: in the last decade, Rwanda experienced a rapid increase in production
  - 1,000,000 tons in year 2000
  - Rwanda one of the biggest producers in EAC
Constraints to sweetpotato production

- Food security perspective and not commercial perspective
- Roots are highly perishable and in-ground storage is limited
- Lack of info on commodity-specific techniques
- Available equipment is inadequate, etc
The opportunity

- Processing of sweetpotato products offers the opportunity to:
  - Increase demand for the crop
  - Increase processor profitability
  - Create value added
  - Expand the incomes of smallholder producers
The challenge

What is the best way to build a value chain for sweetpotato processed products that assures profitability for both farmers and processors and is gender equitable?
Methodology

• Test 2 organizational models for processed product value chains:
  – the first is based on firm (SINA) contracted farmers and
  – the second based on farmer groups organized by an NGO (CRS) delivering to bakeries in urban centers

• Both scenarios offer opportunities to establish SP seed systems on a commercial basis under contrasting agro-ecologies zones and two value chain models
Just two years old: Progress to date
Objective 1: Multiply and deliver appropriate clean planting materials to farmers

- Plantlets hardening
- In-vitro plantlets multiplication at Rubona lab (RAB)
- Transfer of plantlets to the field
- Field multiplication of clean vines
A screen house finished in August, 2011 jointly funded by ASARECA and SASHA
Objective 2

Develop a sweet potato value chain based on farmer group formation, delivering roots & semi-processed products to various processors as a substitute for wheat flour in their bakery line

Kotemu cooperative with Regina Kapinga (BMGF)
(Above photo)

Kundumurimo cooperative in their newly planted field
(Lower photo)
First roots harvested

- Harvested roots by Kundumurimo cooperative (Gakenke/Karambo)
Farmers activities

Farmers at Agri-show

Farmer Margueritte making OFSP puree
Objective 3

Develop a sweet potato (SP) value chain based on contracting farmers who supply roots & semi-processed roots products for use at the Urwibutso factory.

SINA with one of the contracted farmer in the SP field.

Processing of sweet potato bread at SINA factory.
Methodology 1: Processing technology development & dissemination to partner processors

Making of sweet potato puree

Team having sensory test of products at Urwibutso factory at Nyirangarama, Rwanda
Methodology 2: Evaluate consumer acceptance of products & Economic viability

Sensory testing of sweet potato based products at Rubona post harvest unit
Cost of production in Rfr according to the private processor

<table>
<thead>
<tr>
<th>Item</th>
<th>W/sale price per unit (Rfr)</th>
<th>100% wheat Flour</th>
<th>Profit per unit</th>
<th>Mixture of SP and wheat flour</th>
<th>Profit per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread</td>
<td>40</td>
<td>91.14</td>
<td>-51.14</td>
<td>61.7</td>
<td>-21.7</td>
</tr>
<tr>
<td>Doughtnut</td>
<td>160</td>
<td>355.31</td>
<td>-195.31</td>
<td>187.83</td>
<td>-27.83</td>
</tr>
<tr>
<td>Biscuits</td>
<td>70</td>
<td>69.23</td>
<td>0.77</td>
<td>51.03</td>
<td>18.97</td>
</tr>
<tr>
<td>Queen Cakes</td>
<td>80</td>
<td>181.53</td>
<td>-101.53</td>
<td>133.48</td>
<td>-53.48</td>
</tr>
</tbody>
</table>
Design #1: Orange sweetpotato figure playing soccer, with the soccer ball having panels that look like the design of the biscuit. The ball should be golden in color (like the biscuits). Let’s make this an elongated sweetpotato – not a fat chubby one. The legs should look powerful and the eyes very bright and noticeable (since vitamin A helps eyesight).

Under the picture we will have:
Golden Power Biscuits
Make your Vitamin A Goal!

We have made progress in designing sweetpotato based biscuits package well branded to be launched in quarter 3 of 2012.
Rapid Market Survey results
(1 week: April 2011)
<table>
<thead>
<tr>
<th>Changes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreasing</td>
<td>85.7</td>
</tr>
<tr>
<td>Increasing</td>
<td>14.3</td>
</tr>
</tbody>
</table>
## Changes in area under Sweetpotato

<table>
<thead>
<tr>
<th>Trend of the land under SP over time</th>
<th>Producers perception of Main Reason for the trend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land consolidation</td>
</tr>
<tr>
<td>Increasing</td>
<td>%</td>
</tr>
<tr>
<td>Decreasing</td>
<td>64</td>
</tr>
<tr>
<td>Constant</td>
<td>100</td>
</tr>
</tbody>
</table>

Increasing 100

Decreasing 64 27 9

Constant 100
Consumer perception of importance of different crops

Most important staple crop

- Irish potato: 23%
- Sweet potato: 23%
- Beans: 27%
- Cassava: 14%
- Rice: 9%
- Banana: 4%
Ways of consumption of sweet potato

- Boiled SP: 68%
- Cooked/Mashed SP: 27%
- French Fries: 5%
Frequency of Sweetpotato consumption

**Consumption of SP by Men**
- At least once a year: 18%
- At least once a month: 18%
- Everyday: 23%
- At least once a week: 41%

**Consumption of SP by Women**
- At least once a year: 18%
- At least once a month: 18%
- Everyday: 32%
- At least once a week: 50%
Frequency of sweetpotato consumption

**Consumption of SP by children**

- **Atleast once a week**: 50%
- **Atleast once a month**: 18%
- **Everyday**: 32%
Scenario analysis of projected savings if surveyed firms incorporated SP in their products

Scenario prices of SP puree

- Puree price Rfr 150/Kg
- Puree price Rfr 200/Kg
- Puree price Rfr 300/Kg
- Puree price Rfr 400/Kg

Savings per month (US $)

- Median Firm
- Mean Firm
- Biggest firm
**Surveyed Processors: Projected Savings by Incorporating SP into their bakery products**

<table>
<thead>
<tr>
<th></th>
<th>Median firm</th>
<th>Mean (n=11)</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat per day (Kg)</td>
<td>171</td>
<td>320</td>
<td>1400</td>
</tr>
<tr>
<td>30% wheat replaced by SP Puree (kg)</td>
<td>51</td>
<td>96</td>
<td>420</td>
</tr>
<tr>
<td>Puree price/kg</td>
<td>Rfr US $</td>
<td>Rfr US $</td>
<td>Rfr US $</td>
</tr>
<tr>
<td>Daily savings</td>
<td>150</td>
<td>38,475</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>72,000</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>315,000</td>
<td>525</td>
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<tr>
<td>Monthly savings</td>
<td>230,850</td>
<td>385</td>
<td>432,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>720</td>
<td>1,890,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>294,000</td>
<td>490</td>
</tr>
<tr>
<td>Daily savings</td>
<td>200</td>
<td>35,910</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>67,200</td>
<td>112</td>
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<tr>
<td></td>
<td></td>
<td>294,000</td>
<td>490</td>
</tr>
<tr>
<td>Monthly savings</td>
<td>215,460</td>
<td>359</td>
<td>403,200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>672</td>
<td>1,764,000</td>
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<tr>
<td>Daily savings</td>
<td>300</td>
<td>30,780</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>57,600</td>
<td>96</td>
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<td></td>
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<td>252,000</td>
<td>420</td>
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<td>Monthly savings</td>
<td>184,680</td>
<td>308</td>
<td>345,600</td>
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<tr>
<td></td>
<td></td>
<td>576</td>
<td>1,512,000</td>
</tr>
<tr>
<td>Daily savings</td>
<td>400</td>
<td>25,650</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>48,000</td>
<td>80</td>
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<tr>
<td></td>
<td></td>
<td>210,000</td>
<td>350</td>
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<tr>
<td>Monthly savings</td>
<td>153,900</td>
<td>257</td>
<td>288,000</td>
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<td></td>
<td></td>
<td>480</td>
<td>1,260,000</td>
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<td></td>
<td></td>
<td></td>
<td>2,100</td>
</tr>
</tbody>
</table>
Summary of consumer assessment

• Bread
  – Product made out of mix of 30% OFSP puree and 70% wheat flour is preferred to products made of 100% wheat flour

• Doughnut
  – No preference difference between 100% wheat product and a mix of 60% wheat flour and 40% OFSP puree
Summary of consumer assessment

• Biscuits
  – 40% OFSP puree mixed with 60% wheat flour is preferred to one made with 100% wheat flour

• Cake
  – No consumer preference difference between product made out of 100% wheat flour and the ones from a mix of 40% OFSP puree and 60% wheat flour
Year three goals

• Launch commercially viable OFSP and wheat based biscuits with Urwibutso by October 2012
• Launch a second OFSP product (bread) by June 2013
• Ensure that the 20 farmer groups and 20 contracted farmers can supply enough raw material to Urwibutso all the year round
Year three goals

• Recruit at least two new processors and link them to farmer groups by June 2013

• Ensure that farmer groups are able to preserve clean planting material (requires construction of tunnels for FG)
Collaborators and their main roles

1. Rwanda Agricultural Board (RAB) formerly ISAR (Institut des Sciences Agronomiques du Rwanda)
   - Support seed multiplication, dissemination and production technology dissemination
   - Processing technology development and dissemination

2. URWIBUTSO (SINA) Enterprise and other bakers in major urban centers
   - Identify and contract farmers, develop a value chain from roots production to processing
   - Participate in recipes refinements, sensory testing of biscuits, bread, doughnuts, queen cakes, juice and other products with selected WFSP and OFSP varieties
   - Launching of several sweet potato products to the market
3. CRS (Catholic Relief Services) partnering with Imbaraga and YWCA
Develop a sweet potato value chain based on farmer group formation, roots production, semi-processing by farmer groups, and selling to high value markets facilitate market linkages

4. Others Partners are:

- Ministry of Agriculture, Rwanda Bureau of Standards,
- Rwanda Environment Management Authority,
- Kigali Institute of Science and Technology,
- Crop Research Institute of Sichuan Academy of Agricultural