Building commercial partnerships for orange-fleshed sweetpotato processing: Evidence and lessons for programming

A technical report for a workshop held on 29–30 August 2018 in Nairobi, Kenya

January 2019
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEM</td>
<td>Agencia de Desenvolvimento Economico da Provincia de Manica</td>
</tr>
<tr>
<td>CHW</td>
<td>Community health worker</td>
</tr>
<tr>
<td>CIAT</td>
<td>International Center for Tropical Agriculture</td>
</tr>
<tr>
<td>CIP</td>
<td>International Potato Center</td>
</tr>
<tr>
<td>CREADIS</td>
<td>Community Research in Environment and Development Initiatives</td>
</tr>
<tr>
<td>CSO</td>
<td>Civil society organizations</td>
</tr>
<tr>
<td>DARS</td>
<td>Department of Agricultural Research Services (Malawi)</td>
</tr>
<tr>
<td>DVM</td>
<td>Decentralized vine multiplier</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and communication technology</td>
</tr>
<tr>
<td>KCDMS</td>
<td>Kenya Crops and Dairy Market Systems Activity</td>
</tr>
<tr>
<td>KEBS</td>
<td>Kenya Bureau of Standards</td>
</tr>
<tr>
<td>OFSP</td>
<td>Orange-fleshed sweetpotato</td>
</tr>
<tr>
<td>RAB</td>
<td>Rwanda Agricultural Board</td>
</tr>
<tr>
<td>SME</td>
<td>Small and medium-scale enterprise</td>
</tr>
<tr>
<td>UCAM</td>
<td>Uniao de Cooperativas Agrarias de Marracuene</td>
</tr>
<tr>
<td>YWCA</td>
<td>Young Women’s Christian Association</td>
</tr>
</tbody>
</table>
Background

The Scaling up Sweetpotato through Agriculture and Nutrition (SUSTAIN) project implemented in Kenya, Malawi, Mozambique and Rwanda is a five-year project led by the International Potato Center (CIP). Since October 2013, four main outputs have been pursued through various pathways. These outputs include to:

- enhance access to improved orange-fleshed sweetpotato (OFSP) varieties by smallholders, scaled up in at least four countries, reaching at least 1.2 million households having children younger than 5 years.
- increase access to improved nutritional knowledge and diversified use of OFSP by both women and men caregivers.
- introduce at least one commercially marketed processed product that uses OFSP as a major ingredient in each target country.
- contribute to evidence of achieving outcomes and disseminating findings.

As the first phase of SUSTAIN comes to an end, a need was identified to use participatory methods to develop recommendations for guidelines on designing commercial partnerships and co-investment arrangements to support processing and marketing. This report documents deliberations during a two-day workshop that brought together 30 participants drawn from the private sector, civil society, universities, research institutions, and farmers. Participants came from Kenya, Rwanda, Malawi, Mozambique and Tanzania, which allowed for diversity in discussions during the workshop.

The goal of the workshop was to gather insights on options for commercial partnerships and co-investment in OFSP commercialization.

The objectives of the workshop were to:

- provide updates on introduction of commercially marketed processed products that use OFSP as a major ingredient.
- provide feedback on a qualitative study among actors involved in OFSP commercialization in Kenya, Malawi, and Rwanda.
- develop recommendations for partnerships and co-investment in OFSP processing and marketing using participatory methods.

To achieve these workshop objectives, presentations were made by CIP and partners and thematic group discussions were held guided by questions applicable to various interest groups. This report presents the highlights of each of the presentations and in-depth coverage of the deliberations of group discussions.
**Day 1**

**Setting the scene for the workshop**

The opening remarks were provided by Simon Heck who delivered a global overview of the emerging opportunities for OFSP as well as key approaches by CIP in positioning OFSP as a commercial crop through processing. After this the SUSTAIN country team leaders provided country-specific updates with the aim of contextualizing progress made at the country level and explaining what opportunities and challenges exist.

**Partnerships for commercial sweetpotato processing: background and purpose**

*Simon Heck - Program Leader*

The goal of the CIP Sweetpotato Program is to enable at least 15 million households to improve the quality of their diets and raise their crop incomes by 2023 in countries with micronutrient deficiencies in Africa, Asia, and the Caribbean by improving the production and utilization of nutritious, resilient sweetpotato.

![Figure 1: Presence of CIP’s sweetpotato activities in selected countries](image)

**Why a meeting on partnerships for commercial sweetpotato processing?**

Sweetpotato processing is an emerging economic opportunity in Africa. Over the past five years, sweetpotato processing has been shown to have technical feasibility, there have been some initial profitability analyses and business models, and there is lots of local innovation. This is the time to look at the bigger picture:

- What is the scope for growth in different countries?
- What are the motivating and de-motivating factors for private industry to invest?
- What are the technical and business support needs?

**What we know about sweetpotato processing in Africa today:**

- Africa produces over 20 million tons of sweetpotato annually.
- Only a fraction is processed (<1%).
- Traditional processing continues to provide livelihoods through sale of products such as chapatti, mandazi, and local breads.
- Industrial processing is still new.
There is a ‘new kid on the block’ in the form of OFSP puree.

- It is nutritious with high beta-carotene levels and other health benefits.
- It allows cost-saving substitutions where wheat flour is expensive.
- It is a versatile intermediary product that can serve as a base for novel products.
- Pioneer enterprises are taking it up, mainly in the bakery sector.
- Experience is building up on OFSP puree products, technologies and basic business models.
- Research, training, and technology support are being offered through publicly-funded programs.

![Image: Use of OFSP puree by Tuskys supermarkets in Kenya](image)

**Figure 2:** Use of OFSP puree by Tuskys supermarkets in Kenya

**Where do we go from here?**

Take a sector-wide perspective to help guide local momentum:

1. How does sweetpotato processing fit in the wider food industry and what is its scope for growth?
2. What makes private sector food processors invest in OFSP processing?
3. What are the obstacles for further growth?

1. Understanding the scope for growth –
   - Undertaking analysis at the sector-wide level on: (1) the sweetpotato sector, including fresh root markets and supply chains; (2) the food sector; and (3) the plausible investment strategies.
   - Learning from experience by studying the trajectories in other countries, the food value chains, and investors’ priorities.
2. Connecting with the food industry to understand –
   • What drives investment in OFSP processing? Is it demand growth, health conscious consumers, access to technologies, or projects or public-sector support?
   • What are constraints or de-motivating factors, e.g. is it hard to fit OFSP within existing business models or is it that the demand is limited?

3. Some things are becoming easier, such as accessing know-how and technologies –
   • Know-how and technologies are advancing fast and becoming more accessible owing to the scaling down of equipment for smaller users and startups; versatility of equipment for other crops, not just sweetpotato; and availability of solar-powered options.
   • But how do we connect?

**Role of CIP in this process**

- Research
  - OFSP varieties suitable for processing
  - Supply chain development
  - Storage and processing technologies
  - Food and nutrition analyses
  - Development impacts

- Convening of forums
  - Research and industry actors

- Facilitating linkages
  - Along the value chain
  - Between businesses, technical service providers
  - International partnerships
Country specific progress by countries

Update for Kenya

Penina Muoki, Team leader-Kenya

Where does SUSTAIN come from?

The SUSTAIN project was started in 2015 as a response to the various global nutrition challenges. The project focus is on getting OFSP products into the market through public-private partnerships.

![Figure 4: Indication for strong stakeholder support for commercialization of OFSP](image)

The western Kenya region, which is the major producer of sweetpotato in the country, has been selected to implement SUSTAIN in Kenya. In part, introducing OFSP in Western Kenya, assist to align this still less known variety with other well-known varieties—the white and the yellow fleshed varieties).

![Figure 5: Building on existing platforms](image)

A key achievement towards commercialization in Kenya was the identification and engagement of complementary partners that have initiated OFSP commercialization. The major products are puree and bakery products. The inter-relationship created by various players is shown diagrammatically in Figure 6.
Selection of partners was highlighted as a key decision for the Kenya case. Considerations for selection included the following:

i. **Puree processor**
For the puree processor, competitive selection was carried out through advertisements in national newspapers, to find a business willing to co-investment, with the necessary infrastructure and machinery capacity, and which was looking to add a new product line.

ii. **Bakery**
Bakeries were selected for their strong commitment in supporting farmers, vibrant bakery section, line of healthy products, chain of stores, and catering for customers with high to low purchasing power.

iii. **OFSP consortium**
OFSP consortium members were selected from NGOs and government departments dealing with OFSP. The aim was to stagger OFSP planting and to cluster farmers, but success in these was limited for various reasons, such as distance, quantity of roots, presence of farmer organizations, and demand for roots.

iv. **Individual farmers**
Individual farmers had to have at least a quarter acre of land and to be in a cluster of farmers jointly owning a total of 10 acres or more. Individual farmers near the factory of Organi Ltd, an OSFP processor in Western Kenya, currently deliver their sweetpotato roots to the factory, and their gross margins on OFSP are 60% higher than those for maize. OFSP is an emerging cash crop!

v. **Natural Resources Institute**
The Natural Resources Institute, UK brought in expertise in root storage, a critical step in ensuring OFSP roots are available throughout the year to support the emerging processing.
vi. Euro Ingredients Limited/Antonio Food Innovations

Euro Ingredients Ltd, a company based in Kenya with business partners in Europe was selected to provide support with machinery for puree processors and to participate in work on OFSP puree preservatives. The ability to use preservatives would enable rural bakeries to be able to use OFSP puree.

The team leader for Kenya identified the following as emerging issues:

- Transport costs for roots are high, so there is need to have root producers farming within a short radius of the processor.
- Farmers’ organizations need strengthening as part of enhancing efficiency of the value chain.
- The demand for puree is unmet.
- Demand for bakery products is unmet, as indicated by quick sale of bakery products in the participating supermarkets.
- Year-round functioning of the value chains require support through root storage
- Shelf life of puree is an issue to be addressed.

The following comments and observations were raised after the presentation. Due to time constraints, not all questions were answered although the questions provide valuable information for future programming. A detailed presentation from Kenya is available here.

Comment 1: The challenge relating to supplying free vines is similar in Malawi, where some NGOs are involved in this. The distribution of such seed might be a good thing if it is coordinated and its goals are understood by all the actors. However, it can cause a disruption in the market for farmers involved in vine multiplication as a business, who expect to make a premium from vine sales.

Comment 2: In countries with advanced sweetpotato processing industries, processors do not obtain roots from the open market but only from their contracted farmers or farmers’ associations. This takes care of many of the challenges we are familiar with in African countries, such as ensuring root quality and quantity, timeliness of delivery, and price predictability. The questions we should be asking ourselves is, when and how the OFSP processing sector in African countries will also move in that direction, and what will it take in terms of business development and farmer organizational support? Sooner or later we will need to consider this kind of arrangement for OFSP supply chains as we work to enable them to get into commercial processing.

Comment 3: Explore OFSP commercialization through marketing of fresh roots to supermarkets and informal urban markets. Processing takes only a small portion of the roots produced by farmers. An important outlet for sweetpotato is fresh root sales.

Question: What were the challenges faced in packaging, storing, and transporting OFSP puree? Which is your entry point (at Organici) to industrial processing?

Question: Can you show comparative figures for OFSP and other products (wheat products) in terms of their shelf life and acceptability as shown for price, where a 10% premium was associated with OFSP?

Question: Is there any initiative to identify and install a puree processor for the counties of Siaya, Busia, Kakamega, and Bungoma counties, as it has been shown that delivering OFSP roots to the Organici processing plant in Homa Bay is not economically practical?

Question: How much support is provided for aggregating OFSP roots produced by individual small-scale farmers in Migori and Busia to supply adequate volumes to Organici?

Question: Is there any attempt to bring on board organizations to continue supporting farmers with vines so that CIP and other partners ensure that farmers own OFSP as a business for sustainability?

Question: Given that fresh sweetpotato root markets seem to take the bulk of the roots produced, what experience do we have in fresh OFSP sales? What have we learned, if anything?

Question: The stability of OFSP puree is important for ensuring the availability of OFSP all year round. Do we have any success in this?
**Question:** You mention that there was collaboration in postharvest handling; what were the technologies developed and used to store the roots for longer? What was the involvement of farmers in those technologies?

**Question:** Fresh root storage is important for tackling availability of OFSP during the off-season, particularly for rainfed agriculture. Do we have any successful technologies that can be used at the household and group levels?

**Question:** Is there any private sector interest in vine multiplication?

**Question:** How was the root distribution channel organized between farmers and Tuskys? Was it individual farmers or groups? How was the price compared to OFSP market price?

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### Update for Malawi

**Wells Kumwenda, Team Leader- Malawi**

The team leader for Malawi provided the context in which SUSTAIN aligns with national priorities/concerns such as:

- Malnutrition among pregnant women and children younger than 5 years, causing poor sight
- Persistent hunger
- Inadequate incomes
- Natural disasters, mainly droughts and floods.

To respond to these national priorities, SUSTAIN has been working to deliver the four project outputs mentioned earlier in this report.

The approach used in Malawi involved reaching 10 districts in collaboration with various partners, as shown in Table 1 below.

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**Figure 7:** Intervention sites for Malawi
Table 1: SUSTAIN partners and their impact areas, 2016–2017

<table>
<thead>
<tr>
<th>Partner by district</th>
<th>Chitipa</th>
<th>Karonga</th>
<th>Rumphi</th>
<th>Mzimba</th>
<th>Kasungu</th>
<th>Nkhotakota</th>
<th>Thyolo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed the Children</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>World Vision</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadecom Mzuzu</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Welthungerhilfe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Peace Corps</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Ripple Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Care Malawi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Farmers’ World</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Self-Help Africa</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Diocese of Karonga</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Through these partnerships, the team leader indicated that the targets set to reach various beneficiaries were reached.

With regards to commercialization of OFSP, an update was provided that the first piece of equipment for OFSP processing had been ordered and installed in Malawi. It can produce puree for the baking of bread, biscuits, and other confectionary items. Universal Industries, the company that has the equipment, is producing OFSP puree primarily for its own use although a small volume is sold to other processors. There is need for more equipment for other processors to complement Universal Industries in puree making. Like Kenya, the participation of food scientists from CIP and Euro Ingredients Ltd made the initiation of puree processing possible. A key product marketed in Malawi is OFSP crisps.

Comments and questions

The following questions and comments were raised after the presentation of the team leader- Malawi. The full presentation is attached.

Question: What innovations were put in place by OFSP vine multipliers you worked with to ensure clean and adequate plating material was available for OFSP root producers throughout the year?

Question: What was the exit strategy used in areas where SUSTAIN program has come to an end?

Question: Have you tried linking OFSP root producers with the local fresh markets? If yes, what is the consumer feedback?

Response: Yes; the greatest volume of the roots is sold in the local market. Only one company is buying roots from the farmers.

Question: How can a startup get affordable technology for small-scale production?

Question: How has your country ensured product safety for consumers at the level of the processors?

Response: Consumer safety in processing is important in Malawi, and the Malawi Bureau of Standards is involved in enforcing product standards. Processors are required to go through an approval system to qualify to produce and store consumer products. They are checked regularly.
Update from Mozambique

Roland Brouwer

SUSTAIN Mozambique operational setup

In Mozambique, the SUSTAIN intervention area was in the Maputo and Beira development corridors. The project had three targets:

- Reaching 35,000 rural households with OFSP vines and nutrition training.
- Getting at least one OFSP processed product in the market with an annual turnover of USD 80,000.
- Having 300 households connected to the production chain.

The approach had several components:

- Reaching rural households through national nongovernmental implementation partners Agencia de Desenvolvimento Economico da Provincia de Manica (ADEM) and Uniao de Cooperativas Agrarias de Marracuene (UCAM), with a network of locally recruited facilitators.
- Selection of potential processors based on their perceived capacity.
- Investment in recipe development, training, equipment, product promotion and commodity chain linkages.
- Partnership with Euro Ingredients Limited and CIP–Nairobi.

For the output aiming to commercialize OFSP, two technologies that borrowed from the experience in Rwanda were tried in Mozambique as described below.

Table 2: Products incorporating OFSP in Mozambique

<table>
<thead>
<tr>
<th>Juice</th>
<th>Bakery products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successfully piloted in Rwanda</td>
<td>OFSP/soy biscuits as innovative recipe</td>
</tr>
<tr>
<td>Recipe development and taste testing in Maputo and later Manica</td>
<td>Potential to increase viability of soy and OFSP processing</td>
</tr>
<tr>
<td>Relies on imports (bottles, ascorbic acid)</td>
<td>Puree making based on existing investment</td>
</tr>
<tr>
<td>Demanding in hygiene and business management</td>
<td>On-site root processing and transformation in bread/pastry</td>
</tr>
</tbody>
</table>
Value chain

The team leader indicated that OFSP processing only started in August 2016. It covered the two corridors. The four products processed were juice, biscuits, puree and bread/bakery products. There were two value chains: one for the roots to the product, and the other one for the roots to puree. The ten processors together have a turnover of USD 30,500 (56% of the target) was realized in eight months. Of the value 93% was from bread. Fewer than 130 farmers were connected.

Table 3: Status of OFSP processing initiatives

<table>
<thead>
<tr>
<th>Business</th>
<th>Product</th>
<th>CIP’s role*</th>
<th>Raw material</th>
<th>Status</th>
<th>Main difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maputo Bakery</td>
<td>Bakery</td>
<td>R, T, C</td>
<td>Roots</td>
<td>Continues</td>
<td>None</td>
</tr>
<tr>
<td>Manica Processor</td>
<td>Bakery</td>
<td>E, T, R</td>
<td>Roots</td>
<td>Continues</td>
<td>None</td>
</tr>
<tr>
<td>Zebra Farm</td>
<td>Juice, puree, bakery</td>
<td>R, T, P, C, E</td>
<td>Roots</td>
<td>Struggling</td>
<td>Diverse</td>
</tr>
<tr>
<td>Papu</td>
<td>Bakery</td>
<td>R, T, P, C</td>
<td>Roots</td>
<td>Stopped after 6 months</td>
<td>Internal, product</td>
</tr>
<tr>
<td>Nautilus</td>
<td>Bakery</td>
<td>-</td>
<td>Roots</td>
<td>Continues</td>
<td>Scaling out</td>
</tr>
<tr>
<td>Bico de Ouro</td>
<td>Bakery</td>
<td>-</td>
<td>Roots</td>
<td>Continues</td>
<td>Internal</td>
</tr>
<tr>
<td>Dondo</td>
<td>Bakery</td>
<td>C</td>
<td>Puree</td>
<td>Stopped after trying</td>
<td>Internal, distance</td>
</tr>
<tr>
<td>Manga</td>
<td>Bakery</td>
<td>C</td>
<td>Puree</td>
<td>Stopped after while</td>
<td>Distance</td>
</tr>
<tr>
<td>Bom Pão</td>
<td>Bakery</td>
<td>R, T</td>
<td>Puree</td>
<td>Stopped after training</td>
<td>Internal</td>
</tr>
<tr>
<td>Dossivit</td>
<td>Culinary</td>
<td>C</td>
<td>Roots</td>
<td>Start-up</td>
<td>Lack of investment</td>
</tr>
</tbody>
</table>

*R = recipe development, T = training, E = Equipment, P = product promotion and C = commodity chain linkages
Table 3 summarizes the situation as of June 2018 for the processors selected by the project. The following additional insights were provided regarding some of the private investors.

i. Maputo Bakery
Maputo Bakery is in a strategic location in well-off neighborhood and is an established household name in the city. It developed its own bread recipe after tasting CIP’s prototype. Its ‘special breads’ are intended as an opportunity to escape price regulations that apply for 100% and attract a different market segment. It buys sweetpotato roots from the open market through its own intermediary.

ii. Manica processor
This processor was recommended by the local government. The enterprise is supported by AgDevCo, a social impact investor, and GAIN (Global Alliance for Improved Nutrition) as a soy processor on piloting basis. The investment by CIP was in equipment, training and recipe development. The processor started with juice but moved to puree/bakery products when additional own investments became available. It has its own farm and is a member of a producer network set up by CIP.

From the Mozambique experience, Roland drew the following lessons, constraints and opportunities.

iii. Lessons for CIP
• Be responsive to changes in the macroeconomic context.
• Fresh root supply is crucial and having a large, quality supply pool helps.
• Variety-specific end-products limit your options.
• Assess the needs of the partner: they may be outside your scope.
• Small investments may have more impact.
• Be open to learn from entrepreneurs.

iv. Lessons for the business operators
• Dedicate time and concentration on training.
• Be able to assess the quality of equipment.
• Ensure adequate staff, stock, and process management.
• A diversified product portfolio adds opportunities and reduces risks.
• Margins are narrow, and success is not guaranteed.

v. Constraints
• Root washing and peeling are labor intensive and do not fit well in certain business cultures.
• Laborers feel underpaid and entitled to theft.
• Import dependency kills a business.
• High expectations from root producers and partners.

vi. Opportunities
• There is a clear demand for OFSP products.
• New OFSP varieties compete successfully at the farm level, raising fresh root supply.
• There are good recipes and processing technologies.

A full presentation has been provided. The following questions and comments arose after the update presentation for Mozambique;

Questions and comments

Question: How has your country ensured product safety for consumers at the level of the processors?
Response: There is no product safety control in Mozambique or product development evaluation processes.

Question: With regards to the issue of escaping from regulation, how do we do this if we are trying to go to commercial processing of OFSP?
**Question:** Root washing and cleaning are labor intensive and do not fit well in certain business cultures; what is the way forward? Can CIP contribute towards providing some basic equipment?

**Response:** Root washing depends on the processor’s standards.

**Response:** Africa is behind in processing technology. In China you can find machines for washing sweetpotato roots.

**Question:** The margin for OFSP is very small; what is the main factor contributing to this? How has CIP tried to address this challenge, given that the demand for OFSP is growing?

**Response:** Margins are small unless farmers are assured of non-monitory incentives. The only way to increase margins is to expand the scale of production.

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**Update from Rwanda**

*Kirimi Sindi, team leader*

**General context**

Sweetpotato is very important in densely populated areas of Rwanda. The country has a bimodal rainfall and the crop is grown throughout the year. At the onset of SUSTAIN project, there was a lack of improved clean planting material at the time of planting. Among other activities, SUSTAIN in Rwanda aimed to strengthen the seed system to a self-sustaining level. This was done through strategic partnerships with the following organizations:

**Partnerships**

- Young Women’s Christian Association
- Rwandan Farmers Federation (IMBARAGA)
- Rwanda Agricultural Board (RAB)
- Private sector – Urwibutso Enterprises
- Dedicated vine multipliers

**Initial design of intervention**

The implementation design in Rwanda aimed to achieve participation of resource-poor people, especially women and youth, who would benefit from OFSP becoming a commercial crop. Below is a schematic representation of the marketing model pursued in Rwanda.
For the output on seed systems, SUSTAIN Rwanda has achieved clear approaches and partnerships that support continuous production of planting material. Below, a flow diagram illustrates the approach and partnerships used.

The four core outputs of the SUSTAIN project were fully met. In a nutshell:

- At least 250,000 beneficiaries were reached with OFSP vines and agronomic and nutrition training.
- Urwibutsos Enterprise sold processed products worth at least USD 200,000 during the project period and bought OFSP from 400 households.
- The project worked with about 100 Small-scale seed multipliers (decentralized vine multipliers - DVMs) sold OFSP vines worth at least USD 360,000
Options for market creation

Focusing on the commercialization output, four market avenues have been enhanced to create markets for OFSP. These include a processor, regular fresh root market, roadside market, and specialty markets.

Processor

While dealing with processing as a source of market, SUSTAIN Rwanda enhanced the efficiency of technologies used by the processor to integrate OFSP, as illustrated in Figure 12.

![Figure 12: Promoting diversified use OFSP through product value chains](image)

In addition to cookies, bread and doughnuts that substitute substantial amounts of wheat flour have also been promoted in Rwanda.

![Figure 14: Indicative wheat flour substitution for OFSP puree and possible cost savings](image)
As a source of market, the processor presented pros and cons while dealing with smallholder farmers. These include:

Pros
- Provide a year-round market
- Consistently give good stable prices
- Can assist in inputs
- Assist in supply chain management
- Provide great incentives for OFSP adoption

Cons
- Difficult to give a contract
- Sometimes can be a source of hold-ups
- May not be very responsive to prices in the market

**Regular market**

The regular market takes at least 80% of all the roots produced by smallholder farmers. They too present some pros and cons as a market opportunity:

Pros
- Always available
- Provides a market for all root qualities, discriminating them by price
- Utilized by the most people

Cons
- Difficult to reach by some customers, particularly the medium to upper income earners
- Do not discriminate sweetpotato by flesh colors
- May not use a consistent unit of measure
- High price fluctuations
- Inconsistent in terms of root quality

There is a lot of room for development in these markets, which is an important driver for OFSP adoption. It provides the opportunity to develop OFSP market niches.

**Roadside market**

The roadside market is a new concept, established to diversify available markets as well as create increased awareness to road users through the branding that was done. Both branding and building roadside markets are new concepts.
Pros
- If located in a strategic site, a roadside market can be used as an important vehicle to build an OFSP brand and to expose the brand to many potential consumers.
- It provides a market for farmers throughout the year.
- It offers stable prices.
- It creates the opportunity to provide nutrition information.

Cons
- It can be capital intensive.
- When new, it takes time to build and/or brand.
- It takes time to build a client base.

Specialty markets
These include high-end restaurants, hotels and other institutions or online businesses.

Pros
- They are very stable.
- They offer premium prices for good quality sweetpotato roots.

Cons
- They require that products be consistently of premium quality.
- They require good postharvest handling, but not all farmers can meet their quality standards.
- It takes time to develop and grow the market and it needs patience.

Lessons learned from Rwanda
- It takes a lot of capacity building to work with the private sector.
- It takes even more capacity to build cooperatives because of the nature of their membership.
- Marketing of products as a cooperative is not easy because of the institution’s limited understanding of business and erratic income flow.
- Gender is an issue when it comes to processing and marketing of a product, particularly regarding who captures the benefits (youth, women or men).
The following questions followed the update presentation for Rwanda.

**Question:** How has your country ensured product safety for consumers at the level of the processors?

**Response:** Safety standards are important for processing at all levels.

**Question:** What strategy did you have to avoid the government order against the promotion of sweetpotato?

**Response:** OFSP promotion work started with farmers who initially were involved in low-level advocacy. Next, local government authorities lobbied for the farmers after seeing the benefits from consuming OFSP. Now, OFSP is being supported in policy as a priority crop. During the elections of 2017, the ruling party included OFSP in its advertising campaigns, and OFSP roots were given out by campaigners.

**Question:** Your presentation did not mention the use of vines as fodder or the leaves as a source of vegetables.

**Question:** How is the regulatory environment around sweetpotato value? Is it necessary?
Updates on key informant interviews on the uptake of OFSP processing by commercial partners

Key informant interviews were held in Kenya, Rwanda, and Malawi to appraise progress and potential for sustained production of OFSP products as the first phase of SUSTAIN comes to an end. During this workshop, the results of the key informant interviews were presented, in part for participants to connect the work led by CIP, as discussed in section 1 above, and the perceptions of key value chain players supporting commercialization. These two sections will then lead into section 4 on developing some recommendations for commercial partnerships and co-investment. Highlights from the three updates are provided below and links to full presentations have been provided.

Incentives and constraints to expanded and viable OFSP value chain: the case of Kenya

*Julius Okello*

**Research questions**

**General research question**

What factors determine the early interest and adoption of OFSP processing by commercial partners in the urban food sector, and how can incentives be created (and challenges resolved) for private sector (co-)investments at different stages of program implementation?

**Specific research questions**

- How has the OFSP value chain developed from 2015 to date (2018)?
- What are the outcomes, challenges and opportunities (incentives)?
- How were the challenges resolved and were they overcome?
- What institutional innovations were used to overcome the constraints?

**Methods**

The qualitative research was based on the case study approach and incorporated several components:

- **Key informant interviews** with a total of 18 interviewees representing actors from the entire value chain. It was based on a checklist of standardized questions jointly developed by the study team for administration in Kenya, Rwanda and Malawi that implemented a similar study.

- **Focus group discussions** – there were four of these with two for women only and two for men only. They focused on farmers linked to the OFSP value chain, who were all members of farmer organizations, such as cooperative societies and self-help groups. In addition, two independent farmers were interviewed to obtain a non-group perspective.

- **Observations of project participants and others**.
**Overall finding**

The puree and bakery value chain actors, including farmers, all project a real commitment to make OFSP commercialization a reality. As shown in the full presentation attached, each of the partners has had their share of high and low times but the overall outlook is that of a value chain that is growing to achieve some sense of self-sustenance.

**Comments and questions**

**Question:** Were there any observations on women in production, which is important because men normally focus on commercial production while women deal with domestic production? Are there any numbers?

**Question:** How many women were in vine production?

**Answer:** The study focused on the commercial value chain; finances and time did not allow looking at vine production.

**Question:** Did the survey consider comparing OFSP bread and conventional bread?

**Response:** Yes, the survey also looked at non-OFSP bread, but the data are not yet analyzed.

**Question:** What is the implication on the cost of baked products using OFSP flour given that the conversion ratio is 6 kg of roots to 1 kg of flour, when compared to using puree, which has a ratio of 1.2 kg to 1 kg?

**Comment:** The ratio of OFSP fresh roots to flour or dry chips is up to 1 to 5 kg.

**Comments**

Brown bread is preferred to white bread where the nutrition value is a consideration, and the same is bound to be the case with OFSP.

There is need to analyze the data on non-OFSP bread, since the cost of OFSP production seems to be higher than that of regular sweetpotato, and OFSP bread does not compete well with wheat bread.

Bread from OFSP flour is much higher in cost than wheat bread owing to the cost of energy to dry OFSP. Solar is cheaper but it has a problem of consistency in drying and can cause fermentation of the material. Flash drying, which is used for cassava, uses electricity mains but it is very expensive. The other cost is that of the roots. Asian countries that use sweetpotato have industrial production of roots, getting yields of about 40 tons per acre. In Kenya we get about 7–10 tons, and their cost is very high.

Puree has been shown in studies to be cheaper than wheat. It does not need sugar, eggs, color or improvers, so it lowers the cost of production. Moreover, it improves the shelf life of bread owing to the water composition of sweetpotato.

In Meru, a bread making business incurred heavy costs in producing sweetpotato bread because the equipment it acquired had efficiency issues, plus no training was offered to the workers on making the bread and the process changes needed. Product development is key in commercializing OFSP.

The presentation did not discuss the size of the specialty market, which can be interesting and can also show what opportunities there are for bakeries.

The cost-benefit analysis is necessary for private sector investment in processors whether in satellite or production locations.

There is ‘branching off’ of processors in western Kenya who are being contracted by large-scale processors. There are three such processors.
**Question:** Are such small processors also certified by standards organizations?

**Response:** Processing units are certified by KEBS.

**Question:** On the issue of having a processing facility close to the source of raw materials, how is the situation in Kenya, because in Malawi, where farmers lack electricity, water and such, this is important.

**Comments**

Side selling is found also in grain marketing. If farmers are provided credit and outlet markets, and are linked to financial sources, they will not be tempted be sell their crops when they need money.

Avoiding side selling by farmers is important and can be prevented by helping them get money when they need it. Farming credit provision occurs in many commodities. It can work with sweetpotato groups if they have credit and savings schemes. But to effect that can be a challenge, as experience has shown. Most farmers will be forced to sell their crops by pressing financial needs.

Kabondo sub-county, in Homa Bay County was chosen as the location for Organi Ltd following the decision of the Kabondo government to provide the necessary infrastructure to support the plant. It would have been difficult for the processor to provide such infrastructure.

The decision to locate the processing plant in Kabondo was based on the volume of sweetpotato production but not necessarily of OFSP. There are other regions in western Kenya that produce much more OFSP than Kabondo.

The cost of moving puree from Kabondo to Nairobi was KES 3 per kg, so it made sense to bring the processing facility to Nairobi.

CIP staff did a cost study on OFSP and found Organi’s price of KES 14 per kg (USD 0.14 per kg)) to be very reasonable.

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**Incentives and constraints to expansion of a viable OFSP value chain – the case of Malawi**  
*Kirimi Sindi*

**Study questions**

The questions the study sought to address regarding OFSP value chain in Malawi were:

- What were the incentives?
- What were the constraints?
- What were the results?
- What were the lessons learnt?

**Study participants**

- Vine multipliers – 1 large scale and 1 farmers’ group
- Producers – 2
- Processors – 1 large scale, 1 farmers’ group
- Retailers – 2
- Consumers – 2
- Development agencies – 2
- Government agencies – 1
The discussions with key informants and in the focus groups gave a general outlook of a value chain that is still finding its footing amidst a background of subsistence farming and an unorganized market. However, the seed system/vine multiplication has picked up and is operational. Some lessons have emerged from the Malawi case study:

**Lessons learned**

- Coordination of all the actors – policy-makers, researchers, development agencies, farmers, and the private sector – is very important for the success of the value chain.
- The seed system requires some mechanism, such as market guarantees, to de-risk the investment for it to be viable.
- There is need to invest in seed systems at the initial stage to assist farmers to start OFSP production.
- Collective action alone is not enough for smallholder farmers to participate in the seed system.
- The seed system is characterized by very high transaction costs.
- There is coordination failure in roots marketing between the OFSP roots producers and processors.
- The cost of the investment to make differentiated OFSP products is high.
- Proper branding and packaging are very important for OFSP products to be accepted and to be successful in the market.
- Working with medium- to large-scale processors is a long-term commitment and requires building of relationships. It takes a long time to go from OFSP introduction to OFSP product ideas and then to actual products on the shelf.
- The OFSP processing does not require expensive adjustments to machinery or production process for established private manufacturers to start OFSP processing

**Comments and questions**

**Question:** All presentations show that capacity building needs strengthening for farmers, processors, and suppliers, particularly in negotiation skills. Vine multipliers’ market linkages need to be strengthened. How is the program preparing buyers and farmers for sustainability for when the project ends?

**Response:** In Malawi, CIP has worked with farmers, multipliers, and processors, playing a coordination role. Ned Konala, a commercial vine multiplier, has persevered over the seasons and has been successful. CIP has capitalized on his focus and persevering spirit to link him with the market. Ned no longer depends on CIP to market his vines.

**Question:** The discussion here has pointed to the lack of coordination but there seems to be good cooperation. How do these narratives fit together?

**Response:** Some strides have been made in a bid to strengthen and promote linkages along the value chain by establishing the Roots and Tuber Crops Development Trust in 2016. It started operation in 2017.

**Comments**

One area of concern relates to vendors who buy vines from farmers to supply NGOs for distribution to farmers. Such vendors are usually not concerned about quality issues, the need for certification, or proper handling or transportation procedures for the seed, all of which affects vine quality and the market. Education of intermediaries working with NGOs on how to preserve seed is important.
Coordination between the government and partners is good, but how do you sustain it? In Malawi there is a trust; in Rwanda there is a network. Sustainability needs to be pursued with donors, but donors believe that scientists and researchers have no business in the market. But how can we ensure sustainability without being involved in market work? The issue of equity is important. The commercial village model has been tried in Rwanda and Tanzania for equity purposes. Institutions and the government need to recruit business experts if markets are considered as essential for innovation sustainability.

Farm Concern International uses the commercial village model, where the administrative unit of the village is turned into a commercial village. Farmers are mobilized to purchase inputs and access transportation and other services as a group, so they can capitalize on economies of scale. However, they work on their plots individually. A community village trade facilitator collects information on those who need seed and delivers it. Market support involves initiatives such as bringing buyers to talk to farmers on what they need and contacting buyers when roots are available.

CIP has worked with processors and linked them to root producers. The processors approach CIP when the rainfed crop has been used up and they need to be linked up with root producers. Originally CIP used to show them the location of farmers growing roots. The farmers who have benefited the most from this are those who grow OFSP in low lands that retain substantial moisture even during the dry season, because the processor has no other source of roots at that time and is forced to buy from them. Farmers in the CIP database also call CIP to relate to buyers. Supply of OFSP to buyer is affected by various issues including seasonality, cost of transportation, misunderstanding or disagreement between the buyer and the farmer. One such misunderstanding is on whether price is based on tons sold or kilograms sold.

Cooperatives are highly emphasized in Rwanda but they have been found not to function effectively, probably due to the ‘tragedy of the commons’ and the lack of proper dynamics. Do we forget cooperatives and start working with groups?

FAO has a huge module on how to engage cooperatives. If they are producer led, collectives and collective action will be hard to convert into processors. If they are forced or formed by the government, they do not work. When they are already involved in the product of interest to you and you empower them, they will succeed. New generation cooperatives are like companies, where your voting power and share of wealth depends on your investment. FAO also has modules on buyer-driven models.

**Incentives and disincentives to invest in orange-fleshed sweetpotato: the case of pro-poor, public-private partnerships in Rwanda**

*Penina Muoki*

**Research questions**

**Main research question**

How can incentives be created for OFSP value chain actors to invest at different stages of program implementation?
Sub-questions

- What incentives were created by CIP and its1 tier 1 partners to get other value chain actors involved? What were the successes and challenges encountered?

1Tier 1 partners are organizations that received funds from CIP through a sub-grant Agreement
- Did Urwibutso Enterprises, the major buyer of OFSP, must make major adjustments to initiate the OFSP line of products? If yes, was it cost effective to adjust? Did these adjustments pay off?
- Mode of participation by farmers – successes, challenges, and the future role in OFSP enterprise.
- What do OFSP value chain actors in northern Rwanda see as the future of OFSP?

Methodology

Key informant interviews

Data were collected using key informant interviews. At Urwibutso Enterprises those interviewed were Mr. Sina Gereld, the CEO, the head of the bakery, and a baker. Urwibutso Enterprises is a major buyer of OFSP from farmers and it makes OFSP products such as biscuits and doughnuts/mandazi.

Key informant interviews were also conducted with two shop assistants who sell OFSP products. One of the shops was part of the chain of shops owned by Urwibutso Enterprises and the other shop was supplied with OFSP products by Urwibutso Enterprises.

Two interns who supported cooperatives that produced OFSP products, such as cakes and doughnuts were also interviewed.

A key informant interview was held with the head of the sweetpotato program at the Rwanda Agricultural Board.

Focus group discussions

Representatives from four farmers’ groups that sell OFSP roots to Urwibutso Enterprises were interviewed; two consisted of male farmers and two of female farmers. The overall aim was to understand what role farmers were playing in supporting the value chain and their perspectives about OFSP as an enterprise.

Four groups that sell roots at roadside markets also were interviewed; two groups of male and two of female farmers. The overall aim was to understand the operations at roadside markets and the current perceptions of farmers regarding this relatively new initiative led by CIP and its partners.

For all the focus group discussions, each group had eight participants and a questionnaire was used to guide the discussions.

Results

The Rwanda case presents a value chain that is on a growing trajectory but presents emerging uncertainties, possibly due to access to market information. Farmers highlighted challenges selling all their produce. OFSP doughnut and cookies are well accepted by consumers and the major processor. A clear interconnected value chain and responsible actors was demonstrated, as shown in Figure 16.

1 Tier 1 partners are organizations that received funds from CIP through a sub-grant Agreement
**Comments and questions**

**Question:** I like the social perspective to your story. Urwibutso is paying higher prices than the market, but is it sustainable or will they eventually choose to pay close to the market price or source from the market, what will happen?

**Response:** Urwibutso’s higher than market prices are a strategy to maintain the quality of the roots from producers. If farmers expect a high price, they will deliver high-quality produce. Urwibutso aims to obtain materials locally; high prices contribute to the production of high-quality crops.

**Question:** Rwanda has fewer challenges, and things are working better there compared with Kenya. Are they thinking of other innovations to boost farmer participation, e.g. silage?

**Response:** The study was specific, as was the SUSTAIN goal. Also, the small land sizes mean that farmers feed all silage to animals. There is, however, a new project with the goal of making silage production a business.

**Question:** Why was the cooperative not able to create self-regulatory mechanisms for its business operation?

**Response:** The leader of the group would obtain supply date from processor and then they would go to group members to find out who would supply the volumes needed. If there were issues with the produce, the supplier could be identified. In Kenya, self-regulation in Kabodo is not up to scratch. They have no framework for regulation. The cooperative was meant to bake the products for sale in the nearby market, but the members could not work as a group to get that done.

**Question:** Does a ‘fake’ market exist for OFSP in Rwanda?

**Response:** The presence of NGOs and interns in the business can distort the market. The presence of development partners has such an impact too.

**Question:** How was the government response? How did it come? Did the government intervention affect supply?

**Response:** Government interventions could cause market distortion. The role of the government is in food security and it has reasons for intervening to ensure that, but not to distort the market. We need to engage in market-led production.

**Question:** Was the planting material of good quality? How was seed quality monitored?
**Response:** The planting material was of good quality and all was done to keep it so. A seed system tracker is used to register all seed multipliers. They are all called to a meeting before the seed multiplication season begins to decide who among them will grow the seed that season. All local governments provide CIP with the names of all registered multipliers. All the institutional buyers go to CIP to find out where the certified DVMs are.

**Comment:** CIP has collaborated with RAB and implementing partners YWCA and IMBARAGA to train farmers and DVMs on good agronomic practices for production of quality of the vines. We provide training on vine conservation, pest and disease control, and postharvest handling. The project agronomist and agri-promoters do regular follow-up to make sure the fields are well maintained. Before DVMs put their vines up for sale, a visit is made to their farms to check their quality.

**Question:** How do you determine the strength of the low or high links along the value chain in defining the incentives to direct to them in the cases of Rwanda and Kenya value chains?

**Response:** Rwanda and Kenya have different experiences. We may find out that we must work with low links in Rwanda, while in Kenya we deal with high links.

**Comments**

The main reason given during the interviews for the high OFSP production in northern Rwanda was that there was an increase in the number of farmers involved in its production, some of whom had decided to grow it when they saw their neighbors making money from it. Sadly, Urwibutso Enterprises could not take all the farmers’ produce.

A market study may be needed to find out how to expand the market for OFSP products and to understand why it is not expanding.

We are like ‘blind people touching an elephant’, with each describing it based on a narrow perspective. The study was designed for very specific conditions and location. What was needed was broader understanding of the whole value chain. For example, there is a processor who had a shortage of OFSP. The French company Silver Supermarket is asking for OFSP in adequate volumes for a new product line. But they require assurance of constant supply, and this is an issue. The packaging material ban had a big impact, as packaging has to be imported from Nairobi and is constantly in short supply. There are also issues of machines with spare parts that can only be bought in Nairobi. More time should be allocated to a study to understand the whole value chain.

Farmers are relying on only one company as the buyer. In addition, requiring farmers to take their crops to the roadside is adding another responsibility to their burden. There is need to review our approaches to see how best to make our interventions sustainable.

Rwanda needs market development for OFSP to diversify farmers’ options instead of relying on just one processor. The buyer monopoly needs to be eliminated so that farmers are not trapped with one buyer.

The cooperatives also were involved in processing OFSP. Only when farmers are in collective action and they add value to a product do they capture the benefit of the value chain.

The randomized control trial that was led by Michigan State University as an independent evaluator of SUSTAIN project, did not inform this research because it was not quite finished and the area of that study was not covered in our research.
Partners’ experience in approaches for smallholder and SME inclusion

Antonio Food Innovations

*Antonio Magnaghi*

Healthy food ingredients made from 100% orange-fleshed sweetpotato

OFSP is versatile and can be used in many ways in the food industry, for example in sauces, gravy, juices, smoothies, baby food, concentrates and bread, as well as in with meat. All OFSP varieties can be used in such applications. OFSP starch is stable, the puree or concentrate can be pasteurized and stored.

The presentation by Euro Ingredients highlighted a wide range of products that can use OFSP as an ingredient. It was, however, emphasized that the quality of OFSP products depends on the use of the right equipment. And such equipment must be easy to clean and be energy efficient. Adequate care must be taken to ensure that the equipment is maintained well. For example, it requires scheduled maintenance and servicing, to be operated according to the manufacturer’s instructions, and to be protected against power fluctuations.

Comments and questions

**Question:** How do you ensure you acquire efficient equipment to process OFSP?

**Response:** You must understand your product requirements and food safety aspects. Good equipment will be energy efficient, so it does not run-up the operating costs. Make sure that the equipment is dismountable for ease of cleaning. Buy equipment that will fit in its operating environment. For example, if water is a challenge acquire equipment cooled by air. Avoid equipment that can get affected by dust.

Ensure that your staff are properly trained in operation and maintenance of the equipment.

Latex from sweetpotato can complicate cleaning of the equipment, so steam the sweetpotatoes instead of boiling them to reduce the latex. An added advantage of steaming the sweetpotatoes is that you will get a controlled product without excess water.

**Comment:** CIP is not in control of the type of equipment a processor will buy, but we might want to think about redesigning equipment so that it fits our complicated environment.

Kenya Bureau of Standards

*Wilson Kosgey*

The Kenya Bureau of Standards (KEBS) is the national standards body in Kenya. It was established through the Standards Act, Cap. 496 of the Laws of Kenya. Legal notices have expanded its scope. KEBS started its operations on 12 July 1974. Currently it reports to the Ministry of Industry, Trade and Cooperatives. Its operations are guided by its strategic plan and yearly performance contract with the government. It operates a performance management system based on a balanced scorecard. KEBS operates an integrated infrastructure that encompasses standards, metrology, and conformity assessment (SMCA) under one organization.
The presentation by Kosgey highlighted the processes involved in product certification for new products, which includes:

**Product certification process (S/Mark)**
1. Applicant(s) to provide a copy of certificate of registration of business
2. Filling of STA/1 form
3. Payment of S/Mark fee as per the guidelines
4. Registration of standards levy by filling SL1 forms (free)
5. Purchase of applicable standard
6. Inspection of production premises
7. Finished product sampling
8. Preparation and forwarding of product standards compliance report
9. Award of permit
10. Printing of packaging materials
11. Factory surveillance

**Importance of product certification**
- To provide confidence to consumers, regulators, industry, and other interested parties.
- To raise quality awareness in the local market.
- To facilitate trade, market access, fair competition, and consumer acceptance of products at national, regional, and international level.
- To raise efficiency and level of quality of products by manufacturers.

**Comments and questions**

**Question:** Do the certification actions come in the order you presented? I am asking because in Malawi originally the requirement was that product certification included approval of the final and printed version of the labeling. This led to extra costs if the labeling was not approved. But now we can present prequalification labeling, and the final labeling does not need to be printed until after certification.

**Response:** The list of actions is in the order of their execution. Inspection will require you to prepare a template of the labeling but leaving out the section with the KEBS information. The template is submitted for approval and if it is not approved it must be redone and resubmitted.

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**Kenya Crops and Dairy Market Systems project**

**Joseph Mutua**

**About the KCDMS activity**

The Kenya Feed the Future- Kenya Crops and Dairy Market Systems project (KCDMS) is a five-year (Oct 2017–Sept 2022) program of the United States Agency for International Development (USAID). It is funded as part of Feed the Future, the U.S. government’s global hunger and food security initiative that helps to increase agricultural production and reduce poverty and malnutrition in Kenya. KCDMS operates in 12 counties and is designed to spur competitive, resilient market systems in Kenya’s horticulture and dairy sectors. Among the crops that this project has been promoting is sweetpotato, including OFSP. The mode of partnership is through
the private sector applying for funds through submission of concept notes that go through rigorous stages of evaluation before concept notes move to proposal stage and finally grant award. At the time of this workshop, discussions are ongoing with the following partners:

- Super Loaf – Engagement on using sweetpotatoes in their pastries/cookies. They have confirmed willingness to procure 90,000kgs of flour per month from processors. The challenge is that the processors might lack the ability to manage these volumes.
- Khwisero and Siwongo agro-processors – Engagement through business-to-business meetings for linkages with aggregators.
- CREADIS Ltd – Currently processing sweetpotato flour and baking bread and cakes.
- Safe Produce Ltd – Contract farming with farmers in Migori for fresh sweetpotato roots and processing.

**Comments**

It is interesting that Super Loaf is investing in OFSP flour, but bread with OFSP flour cannot be claimed to have the beta-carotene nutritional value. In storage the beta-carotene in OFSP flour is lost in two months unless oxygen is removed from the storage vessel. For nutrition, using OFSP flour does not have value unless it is combined with other products such as OFSP juice. Puree is a cheaper option, it is nutritious and preserves beta-carotene longer at room temperature. Training can be provided so that the bread can be made to bakery specifications. In North Carolina and China, OFSP puree beta-carotene viability has been found to last up to two years. We need to introduce the puree through showing processors its value for them. Its production method also is easier than that for flour.

Another reason is that the producer can claim the nutritional value of OFSP as a special trait. CIP should work with these developers to come up with a product based on OFSP that they can incorporate into their products. It is important that the product contains the ingredients that the processor claims are present.

I am one of the processors who have been using flour, but now we will work to include OFSP puree.

We have worked with CIP scientists to ensure that when we dry OFSP there is minimum loss of beta-carotene, but how do we work to ensure that these issues raised are addressed? How do we maintain volumes and ensure quality?

The history from 2002 has shown that we are still recruiting farmers and there is frustration there because we should be seeing farmers take up OFSP on their own. The initiative of the government on nutrition provides an opportunity for OFSP. The need to have sufficient beta-carotene in the products we are dealing with is important when we are pushing OFSP.

To move OFSP into the market will require training of processors on what their options are for outputs, and it is important for them to know how they should go about processing. Flour has a role, but they need to be aware of all the products, i.e. flour, puree, and others so that they can make informed decisions. For example, in Nigeria that knowledge allows innovation and decision-making to be driven by the market.
Thematic group discussions exploring commercial partnerships and co-investment

The group discussions were organized to allow the participation by stakeholders interested in various aspects of the value chain, as indicated below. The groups were provided with questions to guide their discussion. Each of the groups then made a presentation in plenary and thereafter the questions and comments were made. Below is a summary of the group discussions.

Group 1: Linking OFSP farmers to the market:

Participants: Extension service providers, NGOs, Naivas, Tuskys

1. What do you consider as an achievement/game changing approach in the recent past?
   - Purchase of vines by farmers
   - Contractual engagement on vine multiplication and root production
   - Organizing farmers into groups for collective production and marketing
   - Market linkage through farmer buyers’ forum

2. What do you consider as the major challenge in linking farmers to formal markets?
   - Inconsistent supply of critical volumes of the right quality for sustainability

3. What needs to be done differently?
   - Promoting large-scale production under farmer groups for increased supply to buyers
   - Engagement in commercial contractual farming
   - Processors also to have nucleus farms
4. Who needs to be involved?
- OFSP processing investors
- Researchers
- Extension service advisory
- Regulatory bodies (standards and quality)
- Producers/farmers
- Government agencies
- NGOs
- Financial service providers
- ICT services

Comments
The farmer–business linkages forum contains profiles of producers and they are shared with market stakeholders.

We are looking for game-changing ideas.
The idea of game changers is about how the ideas are applied, e.g. the use of WhatsApp and SMS, and how we move from the current methods, so we have change.

**Question:** Is it possible to use legal mechanisms to bind farmers to contracts? Can county governments be used to enforce the contract agreements?

**Response:** Organizing farmers in groups that can be legally bound to the contract could be one way.

FAO has resources on the legal implications of farming contracts, and these should be accessed to inform the group.
Group 2: Regulators

Participants: CIP, KCDMS, KEBS, University of Nairobi

1. What opportunities exist currently at the country level or regionally for value addition/ manufacturing by SMEs?
   - Many raw materials but bureaus of standards are too stringent
   - Sweetpotatoes processing, though currently very limited
   - No standards for puree
   - Training on food safety in development of various products
   - Sensitization programs for the various SMEs
   - Customized product certification by bureaus of standards with differentiated levels of certification
   - Innovations on underutilized crops such as sweetpotatoes fully embraced by various bureaus of standards
   - Regulations for sweetpotato value chain

2. What constraints exist based on the current policy and regulations, based on your experience working with SMEs?
   - Lack of specified standards for some intermediate products
   - Lack of differentiated levels of certification – SME are expected to enter at the higher level
   - Different institutions with similar mandates; food safety – Ministry of Health, National Environment Management Authority. Need a ‘one-stop shop’
   - Country specific regulations – e.g. ban of plastic bags
   - Conflicting trade policies at national, intergovernmental, and regional levels
   - Multiple government levies.
3. How can these constraints be handled?
   • Develop standards for the subsector
   • Enhance coordination of various players, i.e. establish a one-stop shop
   • Develop certification levels for SMEs and other levels
   • Regional harmonization of standards
   • Development of subsector regulations
   • Establish arbitration mechanisms at national, intergovernmental, and regional levels
   • Harmonized government levies.

4. Who needs to be involved – partnerships and co-investment?
   • National standards bodies
   • Line government ministries
   • Local governments
   • Consumer bodies
   • Research organizations
   • International organizations
   • Financial institutions
   • SMEs of processors, farmer.

Comments and questions

Question: A lot of emphasis was given to international harmonization of standards; to what extent is that a priority given that currently there is no cross-border trade of roots and OFSP?
Response: Lateral product trading across the borders is common, e.g. bread and puree exports are high in the region.

Question: What does ‘SME are expected to enter at higher level’ mean?
Response: In Kenya product certification is uniform across all manufacturers. SMEs can meet challenges trying to meet quality standards. It would be good to have lower level qualification requirements for SMEs that are possible for them to satisfy, provided through a special certification scheme.

Comment: SME qualification standards should cut across all products, not just sweetpotato, to facilitate their entry into the market.
Group 3: Development practitioners

CIP–Rwanda, Department of Agricultural Research Services (Malawi), FAO–Kenya, KCDMS, RAB

1. What roles have your institutions played in linking farmers to markets – could be OFSP or any other agricultural commodity

FAO
- The common interest groups for production marketing, supporting national and county governments through capacity building and facilitation. The projects include *Increasing smallholder productivity and profitability* and *Increased productivity and profitability of small holder farmers through promotion and up-scaling of GAP and CA in productive semi-arid areas of Kenya*.
- Linking farmers to exporters and local markets, working with Unga Group Ltd and Indian markets for pulses and green gram.

DARS
- Certification of vines and products
- Hosting a database of potential vine multipliers

CIP
- Collaborating with independent processors to provide training to farmers in sorting, postharvest handling, packaging and other activities.
- Collaborating with farmers to identify potential areas to produce OFSP.
- Awareness raising through media programs including on marketing and branding.
- Decentralized vine multipliers – setting up seed multipliers and a database.
- Facilitating linkages between producers and markets.

RAB
- Works in collaboration with CIP
- Identifying suitable areas for OFSP processing
- Linking farmers’ groups to potential processors
• Certifies DVMs to produce and distribute quality disease-free planting materials
• Linking DVMs to producer groups

Kenya Crops and Dairy Market systems Project led by RTI International
• Business to business forums
• Partnership Innovation Fund
• Market linkages
• Facilitating private sector investment

2. What have been the major lessons learned while using approaches listed in question 1 – both positive and negative lessons emerging along the implementation process?
• Aggregation and contractual arrangements are the best approaches to link farmers to markets.
• Commitment and willingness to invest are shown by farmers once they learn the quality specifications required.
• Disruptions by national and county governments providing ‘freebies’.
• Financing is key and is needed to facilitate public-private partnerships to provide tailored products fitting OFSP.
• Reliability of production of high-quality products is a challenge.
• Need to increase consumer demand.

3. What opportunities exist currently – e.g. funding priorities/opportunities government policies, market environment, and others that could be exploited to foster commercialization of OFSP?
• Institutional demand for OFSP, school feeding programs, hospitals, jails, refugee camps, kitchen gardens
• Existence of the Partnership Innovation Fund (KCDMS), Agri-Invest (EU), county government investments, and others.
• Government drive on fortification of flour, for example the AFIKEPO KULIMA in Malawi and the Early Childhood Development Program in Rwanda.
• Emergency relief in Malawi leading to development of seed systems.
• Political will for OFSP in Rwanda.
• Emerging and growing demand for natural foods.
• Using OFSP as entry point to combat malnutrition.
• Positive sweetpotato traits, e.g. early maturity and low demand for inputs.

4. Who needs to be involved – partnerships and co-investment?
We are all candidates to change including:
• Policy-makers (politicians)
• Research and development
• Financial service providers
• Health, nutrition and agriculture champions

Comment
Aggregation and use of ICT in communication with markets are ways to bring about innovation.
Group 4: Processors

Participants: CREADIS Agribusiness Development Services Ltd, Euro Ingredients Limited, Esther Aid, Nankhwali Farm, SINAGERAD Enterprises

1. What motivates you to process OFSP?
   - Nutritional value – the market demanding nutritional products is growing.
   - Processed products are more profitable.
   - Processing produces innovative ingredients and products that reduce cost of production.
   - Produces versatile ingredients that can be used in many ways.

2. What constraints do you face – regulatory/policy, quality assurance, raw materials, demand, contract with end users?
   - Regulatory issues – for example, in Kenya use of plastics was banned, bringing for SMEs the challenges of high costs associated with branding and packaging.
   - Quality assurance – challenges regarding supply of raw materials, which might be not available in certain months of the year due to rainfall patterns, and the poor quality of raw materials.
   - Challenges associated with contract farming – farmers not honoring the contracts in cases where prices outside the contract are higher.
   - Inadequate/poor storage facilities for both the roots and processed products.
   - Long certification process.
   - High cost of raw materials, OFSP roots.

3. What would you like to see changed in the status of your processing?
   - Having own source of raw materials besides contracting farmers.
   - National and local governments and donor agencies to support upcoming SMEs to stabilize.
   - Support in marketing, especial for branding, packaging, and advertising.
There should be emphasis on understanding of the various products that can come from OFSP as an ingredient.

To have processing equipment and technology that is affordable and easy to use and manage by SMEs.

Create a platform for interaction of OFSP processors.

4. Who needs to be involved – partnerships and co-investment?
Those involved in partnerships and co-investment should also be able to provide a link for or link SMEs to technical support and affordable loans:

- National and county or local governments
- NGOs and development partners
- Financial institutions
- Academia and research institutions
- Regulatory agencies

Comments and questions

**Question:** Who do you think should not be involved?

**Question:** Who is designing the market? The producer seems to be a victim of the farmer, since the farmer does not seem to recognize the obligation to abide by contracts or to deliver quality produce, while the farmer seems to be the victim of the processor owing to the processor’s power over pricing.

**Response:** Processors should design the market because they know what the needs of their businesses are. Education of processors on this is needed.

**Question:** On the question of puree and flour; why not solve the problem of product stability by using flour?

**Response:** The cost of the flour is too high for the products to be commercially viable. Processors need to understand the functional ingredients of sweetpotato. They need the training to understand the value of the product. What they are doing right now is based on their limited knowledge about the materials they are dealing with.

**Comments**

This is the first group that has talked about digital agriculture. Digital media have become a necessary component in agricultural production.

We need to put emphasis on OFSP product diversification but not just on the puree, as that would lock out other value chain actors, such as those processing baby food products.

Kenya, through KEBS, has instituted product fortification for cereal products, edible oils, and salts. Cereals are fortified with vitamin A along with zinc and other minerals, edible oils are fortified with vitamins, and table salt is fortified with iodine. Applicable standards have specified the levels of the fortificants for each product.
Conclusion

The workshop enabled participants from a variety of countries and backgrounds to understand the progress made in fostering commercial partnerships and co-investments aimed at commercializing OFSP.

The workshop also provided an opportunity for participants to ask questions, discuss issues with each other, and come up with short and long-term recommendations on the way forward in establishing commercial partnerships and co-investment.

A range of recommendations emerged from this workshop which provide pointers for future programming during commercialization of OFSP. A summary of some of the highlights include:

- There is a clear need to develop guidelines for the OFSP value chain development.
- CIP, due to its experience, has an important role in this but needs to work with partners with their specific expertise.
- Raw material supply is best if it is through a combination of three models: nucleus farm, contract farming, and open market.
- Setting up a viable value chain requires time, patience, commitment and money.
- It is best to use an established and experienced entity as an anchor to pull the chain as ‘interest and excitement are not enough’.
- Investment in equipment should consider end-product standards and production environment, i.e. the state and availability of power, water, waste, skills, etc.
- Product development should consider the size and needs of the potential market.
- It is important to minimize coordination and opportunism risks.
- When designing or deciding on a product, take into consideration the certification requirements.
- It is necessary that (internationally agreed) standards are set for the different levels in the commodity chain.
- Branding is essential for market positioning.
- Equity and social responsibility cannot serve as the starting point for successful product commercialization.
- OFSP is a versatile ingredient with a bright future.
- Operation efficiency is essential.
- Coordination failures will limit the amount of investment. These need to be minimized.
- When designing the value chain, it is necessary to look at both the product and the raw materials. These occur at different points in the value chain.
- Include branding, patents and copyright. These are important to protect the product.
- For increased competitiveness, think about labeling products with geographical information to show their origin, especially because we are opening our borders. This should be part of branding.
- The expertise of the actors needs to be profiled to see how it can be exploited for the benefit of the value chain and for information sharing.
- The project is trying to attract existing businesses to get into OFSP, but some entrepreneurs are afraid to invest in new products. However, the youth are passionate about sweetpotato but are facing challenges such as access to technical assistance and technology. We should start thinking of how to invest in the youth to empower them for a sustainable market for OFSP.
• In Tanzania the potential for OFSP commercialization exists, but sustaining root production is hard, so emphasis should go into roots, which have not received as much attention as vines. Currently shortages exist, plus the quality is bad, so the price of roots is as much three times more than that of other crops. This calls for support to farmer root producers.
• Co-investment in capital should be sought to help farmers build storage to prolong the shelf life of roots. Root production is seasonal, so storage is essential. Also, partnerships can be created to provide a central root storage facility for access by processors.
• Assisting farmers and processors like Organi to continue after the project should involve setting up systems for financial support and equipment access.
• The main issue is about the sustainability of the business or market if the project ends, and the factor that can sustain the business is the relationship between the supplier and the processor. Support sometimes is not lifelong and that can affect a business. There should be a proper handing over by CIP and similar players, and an overlapping process for trust in the business to continue.
• We have shared our expectations and concerns about the future of this innovative product, OFSP. What is our expectation and how do we take all that we have learnt to the expected level to meet the main purpose of contributing to food security through OFSP?

Next steps

This workshop provided key recommendations that can be followed up to accelerate commercial partnerships and co-investments in OFSP. Possible action points include:

• Dissemination of the workshop report
• Integrate recommendations in the ongoing project activities where possible
• Integrate recommendations in future projects
• Integrate applicable recommendations in CIP-country strategies
• Initiate knowledge-sharing partnerships among value chain actors identified at the workshop.
## Agenda

**Scaling Up Sweet Potato Through Agriculture and Nutrition (SUSTAIN)**

Technical Round Table meeting

29–30 August 2018

**DAY 1: Wednesday, 29 August 2018**

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<th>Agenda Item</th>
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<td><strong>Morning session</strong> Chair: Julius Okello</td>
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<tr>
<td>8.00-8.30</td>
<td>Registration</td>
<td>Mary Asorit</td>
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<tr>
<td>8.30-9.00</td>
<td>Introduction</td>
<td>Penina Muoki</td>
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<td>9.00-9.30</td>
<td><strong>Opening Remark -Background and purpose</strong></td>
<td>Simon Heck</td>
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<tr>
<td>9.30-10.30</td>
<td>SUSTAIN country updates</td>
<td>Penina, Wells, Roland, and Kirimi</td>
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<tr>
<td>10:30-10:45</td>
<td>Open question session for all countries</td>
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<td>10.45-11.15</td>
<td><strong>BREAK</strong></td>
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<tr>
<td>11.15-11.30</td>
<td>Highlights on commercializing products of research- Technologies, approaches and innovations</td>
<td>Penina Muoki/ Julius Okello</td>
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<td>11.30-12.00</td>
<td>4 Thematic Focus Group Discussions (See attached proposed questions)</td>
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<td>12.00-13.00</td>
<td>Group presentations</td>
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<td>13.00-14.00</td>
<td><strong>LUNCH BREAK</strong></td>
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<td><strong>Afternoon session</strong> Chair: Gladys Nabiswa</td>
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<tr>
<td>14:00-14:30</td>
<td>Feedback from Kenya</td>
<td>Julius</td>
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<tr>
<td>14.30-15:15</td>
<td>4 Thematic Group discussion- Guided questions on recommendations to improve approach</td>
<td>All</td>
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<td>15:15-15:30</td>
<td><strong>BREAK</strong></td>
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<tr>
<td>15:30-16:00</td>
<td>Feedback from Rwanda</td>
<td>Penina</td>
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<tr>
<td>16:00-16:45</td>
<td>4 Thematic Group discussion- Guided questions on recommendations to improve approach</td>
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**DAY 2: Thursday, 30 August 2018**

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<th>Time</th>
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<tr>
<td><strong>Morning session</strong> Chair: Tabither Ajwang</td>
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<tr>
<td>8.30-8.45</td>
<td>Re-cap</td>
<td>Penina</td>
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<tr>
<td>8.45-9.15</td>
<td>Feedback- Malawi Key informants’ interview</td>
<td>Kirimi</td>
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<td>9:15-10:00</td>
<td>4 Thematic Group discussion- Guided questions on recommendations to improve approach</td>
<td>All</td>
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<td>10.00-10:30</td>
<td>Application/ technologies for commercialization of OFSP</td>
<td>Tawanda</td>
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<td>10:30-11:00</td>
<td><strong>BREAK</strong></td>
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<tr>
<td>11.00-12.00</td>
<td>Partners’ experience sharing on approaches for smallholder and SME inclusion- KCD NetBizImpact EPLUS KEBS</td>
<td>Joseph Makeda Nyokabi Kosgey</td>
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<tr>
<td>Time</td>
<td>Session</td>
<td>Speaker(s)</td>
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<td>12:00-13:00</td>
<td>LUNCH</td>
<td>Chair: Roland Brouwer</td>
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<tr>
<td>13:00-15:00</td>
<td>The SYNTHESIS - Recommendations for guidelines for designing commercial partnerships and co-investments in support of OFSP commercialization</td>
<td>Penina, Julius, Kirimi and Tawanda (Assisted by the note taker)</td>
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<td>15:00</td>
<td>Closing Remarks</td>
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<td>Tea/coffee/departure</td>
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<td>---------------------</td>
</tr>
<tr>
<td>Wells Kumwenda</td>
<td>CIP-Malawi</td>
<td>+265881362461</td>
</tr>
<tr>
<td>Felistus Chipunga</td>
<td>CIP-Malawi</td>
<td>+265999933411</td>
</tr>
<tr>
<td>Jean Pankuku</td>
<td>Processor-Malawi</td>
<td>+265999217350</td>
</tr>
<tr>
<td>Ned Konala</td>
<td>Commercial vine multiplier, Malawi</td>
<td>+265888580771</td>
</tr>
<tr>
<td>Bridget Fulagombe</td>
<td>Root and Tuber Crops Development Trust, Malawi</td>
<td>+265888598860</td>
</tr>
<tr>
<td>Evinness Nyalugwe</td>
<td>Crops Department, Ministry of Agriculture Malawi</td>
<td>+265994025165</td>
</tr>
<tr>
<td>Fortunatha J. Mnari</td>
<td>AFCO Investment Co. Ltd, Tanzania</td>
<td>+255768014768</td>
</tr>
<tr>
<td>Jared Odhiambo</td>
<td>Department of Agriculture, Migori County, Kenya</td>
<td>+254705227347</td>
</tr>
<tr>
<td>Tabither Anjwang</td>
<td>Department of Agriculture, Homa Bay County, Kenya</td>
<td>+254722471836</td>
</tr>
<tr>
<td>Benard Otieno</td>
<td>Organi Limited, Kenya</td>
<td>+254700158428</td>
</tr>
<tr>
<td>Gladys Nabiswa</td>
<td>CREADIS</td>
<td>+254713939760</td>
</tr>
<tr>
<td>Mathews Omondi</td>
<td>Ugunja Community Resource Center</td>
<td>+254718468117</td>
</tr>
<tr>
<td>Michael Odongo</td>
<td>Rural Energy and Food Security Organization (REFSO)</td>
<td>+254722688765</td>
</tr>
<tr>
<td>Moses Wamalwa</td>
<td>CIP-Kenya</td>
<td>+254724896387</td>
</tr>
<tr>
<td>Mary Asorit</td>
<td>CIP-Kenya</td>
<td>+254717483862</td>
</tr>
<tr>
<td>Lucas Mbuma Mujuju</td>
<td>Soja-Mozambique</td>
<td>+258 842041284</td>
</tr>
<tr>
<td>Vivian Atakos</td>
<td>CIP-Kenya</td>
<td>+254720924757</td>
</tr>
<tr>
<td>Penina Muoki</td>
<td>CIP-Kenya</td>
<td>+254706284877</td>
</tr>
<tr>
<td>Elizabeth Kamau</td>
<td>FAO-Kenya</td>
<td>+254722892505</td>
</tr>
<tr>
<td>Antony Brouwer</td>
<td>CIP-Ethiopia</td>
<td>+251977937566</td>
</tr>
<tr>
<td>Njokabi Njuguna</td>
<td>EPLUSL</td>
<td>+254725324105</td>
</tr>
<tr>
<td>Dr. George Abong</td>
<td>University of Nairobi</td>
<td>+254700073386</td>
</tr>
<tr>
<td>Makeda Tsegaye</td>
<td>NetBizImpact</td>
<td>+254722290905</td>
</tr>
<tr>
<td>Daniel Mbogo</td>
<td>CIP-Kenya</td>
<td>+254724875428</td>
</tr>
<tr>
<td>Julius Okello</td>
<td>CIP-Uganda</td>
<td>+256756024761</td>
</tr>
<tr>
<td>Simon Heck</td>
<td>CIP-Kenya</td>
<td>+254795329591</td>
</tr>
<tr>
<td>Joseph Mutua</td>
<td>KDCMS</td>
<td>+254728606404</td>
</tr>
<tr>
<td>Christine Akoth</td>
<td>Farm Concern</td>
<td>+254721312388</td>
</tr>
<tr>
<td>John Waithaka</td>
<td>John Waithaka</td>
<td>+254720697862</td>
</tr>
<tr>
<td>Antonio Magnaghi</td>
<td>Antonio Magnaghi</td>
<td>+254721782767</td>
</tr>
<tr>
<td>Kellen Kebaara</td>
<td>Consultant</td>
<td>+254712685224</td>
</tr>
<tr>
<td>Kirimi J Sindi</td>
<td>CIP-Rwanda</td>
<td>+254718104066</td>
</tr>
<tr>
<td>Jean Ndirigwe</td>
<td>RAB</td>
<td>+250732800154</td>
</tr>
<tr>
<td>Valentine Uwase</td>
<td>CIP-Rwanda</td>
<td>+250788529452</td>
</tr>
<tr>
<td>Clare Maete Efiong</td>
<td>Rwanda</td>
<td>+250788649978</td>
</tr>
<tr>
<td>Regis Umugiraneza</td>
<td>Rwanda</td>
<td>+250788419550</td>
</tr>
<tr>
<td>Alexis Nkundayezu</td>
<td>Rwanda</td>
<td>+250788305111</td>
</tr>
<tr>
<td>Wilson Kosgey</td>
<td>KEBS</td>
<td>+254721304733</td>
</tr>
<tr>
<td>Dorcas Mwakoi</td>
<td>USAID-KCDMS</td>
<td>+254722890594</td>
</tr>
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Link to Presentations

1. SUSTAIN Roundtable Meeting of August 2018
Building commercial partnerships for orange-fleshed sweetpotato processing: Evidence and lessons for programming
A technical report for a workshop held on 29–30 August 2018 in Nairobi, Kenya

January 2019