Analysis of the Value Chain for Root and Tuber Crops in Malawi: The Case of Cassava

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INTRODUCTION

- Second most important staple food crop after maize in Malawi
  - Accounts for over 30% of population (Alene et al., 2013) & 41% of area under roots and tubers & over 43% of total production of roots & tubers (Ministry of Agriculture Production Estimates Survey, 2017)
  - Drought tolerant, high-yielding and low production costs (Sandifolo, 2016)
  - Effective at promoting dietary diversity, creating jobs, reducing rural poverty & promoting AFS GDP growth (Benfica & Thurlow, 2017)
Top-Ranked Value-Chains in Malawi

Rural poverty (poverty effect)

Forestry*

Oilseeds* Groundnuts* Pulses*

Cassava, Fruits and vegetable

Maize Other cereals & tobacco

Other crops, potatoes* poultry

Cattle, sheep, etc

Fisheries

AFS GDP (growth effect)

Dietary diversity of the poor (nutrition effect)

* indicates positive employment effect

Source: Benfica & Thurlow, 2017: Identifying Priority Value Chains in Malawi
Rationale of the Study

- The Government of Malawi approved the National Agriculture Policy (NAP) in 2016.
- To operationalise the NAP, the Government embarked on the developing National Agriculture Investment Plan (NAIP).
- To generate some of the evidence needed to design and implement the NAIP, the Ministry of Agriculture commissioned several value chain studies, including one on roots and tubers.
- The results of the study were to inform the identification of priority investment areas for development of commodity value chains under Malawi’s NAIP.
- The key objective of the study was to carry out comprehensive mapping and value chain analysis of the cassava subsector in Malawi.
METHODOLOGY

- Literature Review

- Field Work
  - Quantitative and qualitative data collection
  - FGDs and KIIIs
  - Mapping of value chain actors
  - Study areas: three regions covering 9 districts
  - 250 farmers (21 farmer groups), 19 traders, 21 processors and 16 other key informants
METHODOLOGY Cont’d

- Analytical Approach
  - Value chain approach

- Profitability Analysis

- Cassava Early Generation Seed (EGS) Demand Analysis

- SWOT Analysis
STUDY FINDINGS
Cassava Value Chain Map in Malawi

Seed Breeders (Research institutions (e.g. IITA))

Seed Multipliers and suppliers (NGOs)

Producers (Cassava farmers)

Raw Cassava Traders (Vendors)

Dried Fermented Cassava (Makaka) Processors

Cassava Chips (Mbalanga) Processor

Cassava Flour (Kondoole) Processors

Cassava Flour

High Quality Cassava Flour Processors

Farmer home Consumption cassava flour and cooked snack (about 80 percent)

Village & outside village consumers

Local & Semi Urban Market Consumers

Urban Market Consumers e.g. districts

District Towns & City Consumers (supermarkets)
Production and Productivity

- Cassava production in Malawi is dominated by smallholder farmers and is rain-fed dependent.

- It has traditionally been viewed as a food crop that is increasing its importance due to Maize’s vulnerability to climate change impacts.

- There is high potential for cassava to become commercialized due to high (but unrealised) demand from the confectionary, packaging (starch) and livestock feed industries.

- The main cassava growing areas in Malawi are the Northern belt along the lakeshore with bitter varieties and the southern cassava and Central belt where sweet varieties are predominant.
Figure 1: Estimated cassava production in Malawi by district, 2016/17 cropping season, metric tons

Source: Maps produced by Todd Benson (IFPRI) using APES and DLRC data
Productivity of Cassava in Malawi

Variety yield improvement programme by IITA-SARNET Project
Marketing of Cassava and cassava products

- Smallholders sell 25-50% of produced cassava (Scramp, 2013)
- Fresh market takes up about 80% of marketed cassava; remainder in processing, manufacturing & confectionary industries (Alene et al. 2013)
- Other products: unmilled dried cassava roots (makaka), fermented cassava flour (kondoole), cassava chips, High Quality Cassava Flour (HQCF), livestock feed (Ndatani Premier Feeds)
- Potential demand for HQCF is estimated at about 16,000 mt/year (Sandifolo, 2011) but very little of this is exploited. The unexploited potential market for HQCF is in confectionary, packaging, and brewery industries (FAO 2017).
- The market for HQCF is Universal Industries, small-scale bakeries, mandazi (deep fried dough) producers, and staple food for Indian, Nigerian, Burundian & DRC populations.
### Price Value Changes along Cassava Value Chain

<table>
<thead>
<tr>
<th></th>
<th>Farmer</th>
<th>Trader</th>
<th>Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava Prices (MK/kg)</td>
<td>115.8</td>
<td>192.54</td>
<td>275.9 (Cassava flour_1)</td>
</tr>
<tr>
<td>Price value change</td>
<td>Base</td>
<td>66 %</td>
<td>43 %</td>
</tr>
<tr>
<td>Farmer-to processor</td>
<td></td>
<td>138 %</td>
<td>161 %</td>
</tr>
</tbody>
</table>

1 US$=725 MK
Gross Margin Analysis along the Cassava Value Chain

GM (%)

<table>
<thead>
<tr>
<th>Category</th>
<th>GM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers</td>
<td>70</td>
</tr>
<tr>
<td>Traders</td>
<td>57</td>
</tr>
<tr>
<td>Proc_Cassava flour_1</td>
<td>40</td>
</tr>
<tr>
<td>Proc_HQCF</td>
<td>44</td>
</tr>
<tr>
<td>Proc_Cassava flour_2</td>
<td>53</td>
</tr>
<tr>
<td>Proc_Makaka</td>
<td>76</td>
</tr>
<tr>
<td>Proc_Chips</td>
<td></td>
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</tbody>
</table>

Proc = Processor; GM = Gross margins
Cassava EGS Demand Analysis

Key model variables:
- Adoption rates of improved varieties, seed rate, replacement rates, seed yield.

Three cases developed:
- Current EGS supply: Current level of supply in market, based on current adoption rate of improved varieties of 60% and current market conditions.
- Potential EGS demand - base case: Assumed that adoption rate of improved varieties is 80% and all EGS specific recommendations are implemented, with other market impediments assumed to remain in place.
- Potential EGS demand - best case: Assumed 90% adoption rate for improved varieties, all EGS specific recommendations are implemented, and other value chain and policy constraints are addressed (e.g., downstream value chain improvements, and best agronomic practices followed).
Cassava EGS Analysis Results

- 60% of 228,000 ha of land allocated to cassava (2016) with improved varieties
- Current demand-commercial seed estimated at 400 million cuttings nationwide
- When assessed at 80% and 90%, potential demand increases by over 600% and 800%, respectively, representing 9 fold increase
# Challenges & Constraints in the Cassava Value Chain

<table>
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<th>Production level (producers)</th>
<th>Traders (marketing)</th>
<th>Processors</th>
<th>Policy level</th>
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<tr>
<td>• Limited availability &amp; accessibility to (clean) planting materials</td>
<td>• Limited capital for business expansion</td>
<td>• Limited investment in value addition technologies</td>
<td>• Weak regulation and enforcement product quality standards</td>
</tr>
<tr>
<td>• Pests and diseases contributing to low production and productivity:</td>
<td>• Perishability that leads to spoilage</td>
<td>• Poor quality equipment/machinery</td>
<td>☐ Limited capacity</td>
</tr>
<tr>
<td>➢ E.g. Cassava Mosaic Diseases and Cassava Brown Streak (CBS) and termites</td>
<td>• Limited access to financial services</td>
<td>• Unreliable and intermittent power &amp; water supply</td>
<td>• Lack of emphasis in some policy documents e.g. in the NES</td>
</tr>
<tr>
<td>• Lack of reliable and established markets</td>
<td>• Lack of storage facilities such as cold storage facilities.</td>
<td>• Low &amp; inconsistent supply of raw materials</td>
<td>• Limited government support</td>
</tr>
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<td>➢ Non-establishment of contract farming</td>
<td>• Low and seasonal production which is affecting supply on the market</td>
<td>• Lack of quality standards for roots and tubers products</td>
<td>☐ Adhoc programs and interventions</td>
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<td>• Limited extension &amp; research</td>
<td>• Limited market structures</td>
<td></td>
<td>• No commodity specific development strategies/policies</td>
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<td>➢ Poor agronomic practices</td>
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<td>➢ Post-harvest losses</td>
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Sun drying of cassava in production of HQCF in Nkhotakota (Central Malawi)

Non-functional Cassava-starch processing factory-Nkhatatabay (Northern Malawi)
Strategic Recommendations

- Significant investments in the seed system to increase availability and access to quality planting materials.
- Investments in research and extension on appropriate varieties and best agronomic practices to improve productivity.
- Investments in irrigation technologies to support and promote winter production.
  - To increase productivity and maintain consistent supply on the market
- Investments in value-addition and agro-processing technologies to stimulate demand for various products, particularly HQCF.
- Farmer organisation development (e.g. contract farming) and training for market access.
- Capacity building for various players along the value chain in quality management of planting material, primary product and processed products.