LEGUME MARKET ANALYSIS

Uganda

March 2012

The materials in this presentation are incomplete. For the full analysis, please consult the final project report at http://www.mim.monitor.com/articles_ideas.html.
AGENDA

Country Background

Legume Market Overview
Potential interventions in common bean, groundnut and soybean value chains would have significant impact on smallholders in Uganda

Agricultural Sector
- Despite a decline in the rate of growth of the agricultural sector and its contribution to GDP, it remains a critical sector for Uganda
  - Government has placed renewed focus on revitalizing the sector
- Legumes are important within the agricultural sector, but farmers are not well organized
  - 19% of total arable land is cultivated with focus legumes
  - Legumes farmers are mostly concentrated in the southwest and north of the country
  - There is limited farmer organization which could limit the impact of interventions

Potential Interventions
- Three broad intervention themes have the potential to improve the livelihoods of SHFs
  - R&D development to create more resilient varieties
  - Intensification to increase output and productivity
  - Value addition and market access

Population Impact
- Of the focus countries, Uganda has one of the lowest percentages of the population living below the poverty line (64%)
- Despite this, a significant portion of the labor force (75%) is engaged in agricultural activities
- There is potential to impact 2.4M smallholder farmers\(^1\) of legumes

Focus Crop Production
- Common bean and groundnut dominate the legume market accounting for 49% and 30% of the market respectively
- Soybean production is growing driven by increased processing and livestock feed requirements

Note: \(^1\) The percentage of smallholder farmers out of total farmers is estimated at 90%
Source: Monitor Analysis; World Bank, Nov 2011; FAO Country Profiles, Nov 2011; FAOSTAT, Updated May 2011
SIGNIFICANCE OF AGRICULTURE

Agricultural contribution to GDP has declined due to post harvest losses, pests, disease and flooding in the East; food crop activities, however, have grown due to high market prices.

**Uganda GDP Trend (Nominal)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Services</th>
<th>Industry</th>
<th>Total (USD B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>22.8%</td>
<td>47.2%</td>
<td>24.1%</td>
<td>93.1%</td>
</tr>
<tr>
<td>2009</td>
<td>24.6%</td>
<td>45.4%</td>
<td>23.9%</td>
<td>93.9%</td>
</tr>
<tr>
<td></td>
<td>+13%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Split of Agricultural GDP**

<table>
<thead>
<tr>
<th>Sector</th>
<th>2009</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Crops</td>
<td>60%</td>
<td>43%</td>
</tr>
<tr>
<td>Cash Crops</td>
<td>14%</td>
<td>12%</td>
</tr>
<tr>
<td>Forestry</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Fishing</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>Livestock</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Pulses</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Legumes</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Root Crops</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>Plantain</td>
<td>39%</td>
<td></td>
</tr>
</tbody>
</table>

- General decline in agricultural sector contribution to GDP due to post harvest losses, effects of pests and diseases and flooding in Eastern Uganda.
- However, food crop activities grew due to high market prices (leading to increased production), increased acreage under food crops and prolonged rainy seasons.
- Despite declining growth rates, agriculture remains a significant sector for the Ugandan population.

Note: 1 Split of crops is by volume. 2 Pulses include beans, field peas, cowpeas and pigeon peas. 3 Legumes include groundnuts, soybeans, sim sim and sunflower. Source: Bank of Uganda Statistics, accessed 17 January, 2011; “Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) Statistical Abstract”, 2010; Monitor Analysis.
**COUNTRY BACKGROUND**

**AGRICULTURAL POLICY AND REFORM**

*Despite a number of policy initiatives to improve productivity and reduce poverty, the agricultural sector has failed to undergo structural transformation towards commercialization*

### Ugandan Agricultural Policy

<table>
<thead>
<tr>
<th>1986–1990s</th>
<th>Late 90’s–2000’s</th>
<th>Currently</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Following the decline of agricultural productivity during the Amin regime, the National Resistance Army set out to modernize agriculture</td>
<td>• Focus shift away from production towards poverty alleviation through an emphasis on resuscitating rural growth</td>
<td>• The Development Strategy for Investment Plan (DSIP) outlines the agricultural sector policy agenda for 2010/11 to 2014/15</td>
</tr>
<tr>
<td>• Policies facilitating increasing production were favored over poverty reduction</td>
<td>• The Plan for the Modernization of Agriculture (PMA) was drafted in 2001, upon two broad pillars – Agriculture is critical for poverty eradication – Development is dependent on multi-sectoral interventions</td>
<td>• The development goals of the set of policies are improving rural livelihoods and food security</td>
</tr>
<tr>
<td>• In line with the structural adjustment agenda, large-scale deregulation and macro-economic reforms took place</td>
<td>• The National Agricultural Advisory Services (NAADS) was placed at the heart of the PMA – NAADS seeks to provide extension services to farmers in order to increase access to information, technology and technology</td>
<td>• The DSIP aims to achieve these aims through enhancing productivity, developing primary and secondary agricultural markets and improving the legal, policy and institutional frameworks</td>
</tr>
<tr>
<td>• The implementation of specific interventions such as micro-credit schemes and the Livestock Services Project have been viewed as unsuccessful</td>
<td></td>
<td>• Within agriculture, the ministry highlights crops such as common bean, maize, rice, banana, cassava, sweet potato and coffee as very important</td>
</tr>
</tbody>
</table>

### Assessment of Agricultural Policy in Uganda

• Despite a long period of peace and relative economic prosperity, the agricultural sector has failed to undergo a structural transformation towards commercial agriculture and value addition in the form of processing
• Low yields, poor quality produce and a lack of primary and secondary markets for agricultural produce continue to plague the sector
• The government has placed increased importance on the agricultural sector as a driver of growth and poverty reduction in the recent past

Impact of Policy and Regulatory Climate on Legume Value Chains

- **Input Supply**
  - Improved access to high quality inputs (Plan for the Modernization of Agriculture)

- **Production**
  - Increased value addition and market access through strengthening farmer organizations and improving rural infrastructure
  - **Improved storage** through the provision of technical support and construction materials to bean farmers (Agriculture Development Project)

- **Aggregation**
  - Improved private sector involvement in agricultural value chains due to an improved enabling environment (Agriculture Sector Development Strategy and Investment Plan)

- **Processing**

- **Buyers / Consumers**

- **Increased production and productivity** through research and technology, sustainable land management and mechanization (Plan for the Modernization of Agriculture)
- **Increased advisory and extension services** to farmers through the National Agriculture Advisory Services
  - Provides advice on productivity enhancing technologies, soil conservation, knowledge and skills development, marketing, storage and agro-processing

- **Development of basic physical infrastructure** including roads, rural electrification, communication infrastructure and energy development (Agriculture Sector Development Strategy and Investment Plan)
- **Improved enabling environment and institutional capacity** (Agriculture Sector Development Strategy and Investment Plan)
  - Removal of critical constraints to private sector growth
  - Support of opportunities to improve market efficiencies
  - Improvement of incentive environment for the private sector in key value chains

Source: ‘Agriculture Sector Development Strategy and Investment Plan’, Ministry of Agriculture, Animal Industries and Fisheries, 2010; Plan for the Modernization of Agriculture (PMA); Agriculture Development Project; Monitor Analysis
**COUNTRY BACKGROUND**

**INFRASTRUCTURE**

*Infrastructure in Uganda is relatively more developed likely leading to easier movement of produce across the country; Uganda has the best logistics rankings of all the focus countries.*

**Percentage of Total Roads Paved (2004)**

<table>
<thead>
<tr>
<th></th>
<th>Burkina Faso</th>
<th>Ethiopia</th>
<th>Ghana</th>
<th>Mali</th>
<th>Nigeria</th>
<th>Uganda</th>
<th>Tanzania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>4%</td>
<td>19%</td>
<td>18%</td>
<td>18%</td>
<td>15%</td>
<td>23%</td>
<td>9%</td>
</tr>
</tbody>
</table>

**Road Density (2004)**

<table>
<thead>
<tr>
<th></th>
<th>Burkina Faso</th>
<th>Ethiopia</th>
<th>Ghana</th>
<th>Mali</th>
<th>Nigeria</th>
<th>Uganda</th>
<th>Tanzania</th>
</tr>
</thead>
<tbody>
<tr>
<td>(km/100 km²)</td>
<td>34</td>
<td>23</td>
<td>21</td>
<td>29</td>
<td>21</td>
<td>8</td>
<td>34</td>
</tr>
</tbody>
</table>

Possibly due to the fact that Uganda is a small country with a large and dense population.

**Uganda’s Scores on the LPI**

- **Customs**: Border control efficiency (speed, simplicity, predictability)
- **Infrastructure**: Trade and transport infra. quality (ports, rail, road, IT)
- **International Shipments**: Ease of arranging competitively priced shipments
- **Logistics Competence**: Competence and quality of logistics services
- **Tracking & Tracing**: Ability to track and trace consignments
- **Timeliness**: Timely arrival of shipments

Scoring is ranked from worst (0) to best (4)

**World LPI Rankings of Focus Countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>2011 Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uganda</td>
<td>66</td>
</tr>
<tr>
<td>Tanzania</td>
<td>95</td>
</tr>
<tr>
<td>Nigeria</td>
<td>100</td>
</tr>
<tr>
<td>Ghana</td>
<td>117</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>123</td>
</tr>
<tr>
<td>Mali</td>
<td>139</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>145</td>
</tr>
</tbody>
</table>

Note: 1 2003 data for Ghana, Tanzania and Uganda; 2 2003 data for Tanzania and Uganda; 3 Logistics Performance Index (155 countries ranked); 4 Customs: Border control efficiency (speed, simplicity, predictability), Infra.: Trade and transport infra. quality (ports, rail, road, IT), Intl. Shipments: Ease of arranging competitively priced shipments, Logistics Competence: Competence and quality of logistics services, Tracking and tracing: Ability to track and trace consignments; Timeliness: Timely arrival of shipments

AGENDA

Country Background

Legume Market Overview
LEGUME MARKET OVERVIEW

DIETARY IMPORTANCE OF LEGUMES

Legumes form an important protein supplement to an otherwise very low protein diet

**Legume¹ Contribution to per Capita Protein Intake, 2007**

- **Uganda**: 25%
- **Burkina Faso**: 19%
- **Tanzania**: 19%
- **Nigeria**: 17%
- **Ethiopia**: 16%
- **India**: 13%
- **Mali**: 9%
- **Ghana**: 6%
- **Bangladesh**: 5%

**Legume Protein Contribution by Type, Uganda**

- **Common Beans**: 58%
- **Groundnuts**: 14%
- **Other Legumes**: 24%
- **Soybeans**: 5%

**Legume¹ Contribution to per Capita Calorie Intake, 2007**

- **Uganda**: 11%
- **Burkina Faso**: 9%
- **Tanzania**: 8%
- **Ethiopia**: 6%
- **Nigeria**: 6%
- **India**: 5%
- **Mali**: 4%
- **Ghana**: 3%
- **Bangladesh**: 1%

- **Roughly one quarter of the protein** in the average Ugandan diet is sourced from legumes; however overall protein intake is exceptionally low (~48 grams/day)
- **Common beans** are the greatest contributor of all the legumes

Note: ¹ Legumes include groundnuts, soybeans, common beans and other legumes; ² Other legumes includes cowpeas, chickpeas, peas and pigeon peas
Source: AgDev; FAOSTAT; Monitor Analysis
**Gender Roles in Legume Farming in Uganda**

<table>
<thead>
<tr>
<th>Roles</th>
<th>Women</th>
<th>Men</th>
<th>Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
<td>- Responsible for <strong>weeding as well as harvesting</strong></td>
<td>- Usually responsible for <strong>plowing</strong> the land</td>
<td>- <strong>Planting</strong> is done by the whole family</td>
</tr>
<tr>
<td><strong>Post-Production</strong></td>
<td>- Threshing, sealing and <strong>sorting</strong> is generally carried out by women and children</td>
<td>- Men take most of the responsibility for marketing, and <strong>looking after revenue</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Small-scale local sales</td>
<td>- <strong>Large-scale commercial sales in urban</strong> markets</td>
<td></td>
</tr>
<tr>
<td><strong>Decision-making</strong></td>
<td>- Responsible for decision making when men are away from the home</td>
<td>- Traditionally responsible for most decision making</td>
<td>- Increasingly, <strong>decisions regarding production are being made by husbands and wives together</strong></td>
</tr>
<tr>
<td></td>
<td>- Increasingly, <strong>female headed households are emerging</strong>, where women most decisions</td>
<td>- Responsible for <strong>decisions involving large sums of money and commercial activities</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Research; Monitor Analysis
Overall, Uganda’s legume market has experienced solid growth at 17.7% p.a. driven by high regional prices; it is a USD 602M industry dominated by common beans.

Market Size of Focus Crops in Uganda

- **Common Beans**: 49% of the market, USD 288.6M
- **Groundnuts**: 17% of the market, USD 137.4M
- **Soybeans**: 21% of the market, USD 123.9M
- **Cowpeas**: 9% of the market, USD 52.1M

The legumes market has grown driven primarily by the growth in market prices and production volumes:
- Increasing demand from drought-prone neighboring countries has increased demand, leading to higher prices.
- Increasingly Ugandans are becoming aware of the positive nutritional impact of legumes and are increasing their intake.

Note:
1. Market size is calculated for the 4 focus crops that are cultivated in Uganda.
2. Market size is calculated as the product of consumption (metric tons) and producer price (USD).
3. Producer prices are based on the East African average as prices were not available for Uganda.
4. Shares may not add to 100% due to rounding.

Source:
- FAOSTAT official data — Updated May 2011
- Primary Interviews
- Monitor Analysis
LEGUME MARKET OVERVIEW

CONSUMPTION OVERVIEW (1/3)

Legume consumption has remained relatively stable in the recent past; only common bean consumption has declined.

Consumption of Focus Crops in Uganda

<table>
<thead>
<tr>
<th>Year</th>
<th>Common Bean</th>
<th>Cowpea</th>
<th>Groundnut</th>
<th>Soybean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>51%</td>
<td>17%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>2006</td>
<td>47%</td>
<td>20%</td>
<td>18%</td>
<td>20%</td>
</tr>
<tr>
<td>2007</td>
<td>50%</td>
<td>22%</td>
<td>19%</td>
<td>20%</td>
</tr>
<tr>
<td>2008</td>
<td>52%</td>
<td>22%</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>2009</td>
<td>49%</td>
<td>10%</td>
<td>10%</td>
<td>21%</td>
</tr>
</tbody>
</table>

Consumption / Demand Trends and Drivers

- **Local consumption**
  - In line with groundnut production, the most consumption occurs in Northern and Eastern Uganda
  - Most consumption as groundnut powder paste. Some consumption as roasted snack

- **Primarily local industrial consumption**
  - Limited local consumption due to inadequate knowledge of nutritional benefits
  - Major consumers: oil millers, food processors, animal feed manufacturers
    - Significant demand from growing poultry sector which has grown at 3% p.a. since 2008
    - Production of soy milk (current non-genetically modified soy varieties are preferred by processors)

- **Informal regional trade**
  - Demand for soy cake in Kenya due to improved dairy farming

- **Local consumption**
  - Popular and major source of food security consumed daily in almost all Ugandan homes
  - Readily available for both rural and urban populations
  - Provides 25% of calories and 45% of proteins in UG diet

- **Growing regional demand**
  - High demand for beans in Kenya, Sudan and the DRC

CAGR (‘05–’09)

- **Groundnut**: 3.4%
- **Cowpea**: 4.1%
- **Soybean**: 2.1%
- **Common Bean**: -2.2%

Consumption of legumes is primarily as food, except in the case of soybean which is mostly used in the processing and animal feed industries.

### Split of Legume Uses in Uganda, 2007

- **Legumes**:
  - Food: 58%
  - Processing: 21%
  - Feed: 15%
  - Seed: 3%

- **Groundnut**:
  - Food: 65%
  - Processing: 14%
  - Feed: 6%
  - Seed: 8%

- **Soybean**:
  - Food: 49%
  - Processing: 38%
  - Feed: 3%
  - Seed: 3%

- **Common Bean**:
  - Food: 100%

- The bulk of soybean consumption is:
  - Processing into animal feed to supply the growing livestock market, especially the dairy sector
  - Processing into edible oil and flour for porridge and baby food

Source: AgDev
**Common bean is the most important of all the focus crops as it is consumed daily in almost all Ugandan households**

<table>
<thead>
<tr>
<th>Importance</th>
<th>Common Beans</th>
<th>Cowpeas</th>
<th>Groundnuts</th>
<th>Soybeans</th>
</tr>
</thead>
</table>
| Importance | • Important nutritionally  
| | • Consumed between four and ten times per week by each family | • Less important and grown as a side crop | • Very important nutritionally and economically in Northern and Eastern regions | • Important in processing industry |

<table>
<thead>
<tr>
<th>Uses</th>
<th>Common Beans</th>
<th>Cowpeas</th>
<th>Groundnuts</th>
<th>Soybeans</th>
</tr>
</thead>
</table>
| Uses | • Home consumption — eaten daily in almost all Ugandans homes for both lunch and dinner  
| | • Also consumed significantly in schools and hospitals | • Limited use — where they are consumed it is usually as an additional vegetable | • Used to prepare various traditional meals; peanut sauce, butter and paste are popular uses  
| | | | • Roasted peanuts are a popular snack |

<table>
<thead>
<tr>
<th>Consumption</th>
<th>Common Beans</th>
<th>Cowpeas</th>
<th>Groundnuts</th>
<th>Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption</td>
<td>• Eaten everyday as a standard part of meals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Status</th>
<th>Common Beans</th>
<th>Cowpeas</th>
<th>Groundnuts</th>
<th>Soybeans</th>
</tr>
</thead>
</table>
| Production/ Selling | • There are different types of beans of differing quality and thus price  
| | • In addition to pricing a factor that affects the purchase and consumption of beans is the availability and affordability of fuel to cook the beans | | | |  

Source: Primary Interviews; Monitor Analysis
Production of legumes is concentrated in the Great Lakes Region in southwestern Uganda, as well as in the northern regions of Uganda.
LEGUME MARKET OVERVIEW

R&D INSTITUTIONAL CAPACITY

Production of certified seed for select legumes has declined at 13% p.a. due to limited institutional capacity and lack of private sector involvement in seed multiplication and certification.

There are opportunities for small local seed producers to multiply and distribute preferred local legume varieties to mitigate limited private seed player involvement in value chains.

Seed Research Institutes and their Mandate Crops:

- **NARO**: Common Bean, Cowpea, Groundnut, Soybean
- **SARI**: Common Bean, Cowpea, Soybean
- **Makerere**
- **USP**: Common Bean, Soybean

Major Seed Companies for Focus Legumes:

- **Victoria Seeds Ltd**: Common Bean, Cowpea, Groundnut, Soybean
- **East African Seed Co. Ltd**: Common Bean, Cowpea, Soybean
- **Fica Seeds**: Common Bean, Groundnut, Soybean
- **Nalweyo Seed Co. (NASECO)**: Cowpea, Groundnut, Soybean
- **Input Traders**: Common Bean, Cowpea, Groundnut, Soybean

**Note:** 1 National Agricultural Research Organization; 2 Serere Agricultural Research Institute; 3 Uganda Seed Project; 4 Tend to stock seed, fertilizer, agrochemicals and agricultural equipment and machinery.

Source: ‘Bean marketing in Uganda: constraints and opportunities’, Ephraim Nkonya, IFPRI, 2001; ‘Strategic marketing problems in the Uganda maize seed Industry’, D.W Larson and S. Mbowa, 2004; Company Websites; Monitor Analysis
Overall, marginal growth in production is primarily a function of growth in land area; yields remain relatively low for most legumes.

Market Demand and Market Prices

Production Cost and Prices (of Substitutes)

Source: FAOSTAT; “World Agriculture Towards 2015/2030”, FAO, 2002; Expert Interview; Monitor Analysis
Common beans account for 50% of legume production although production is declining due to low yields and farmers shifting from beans to more lucrative crops such as fruits, vegetables and soybean to a lesser extent.

### Production of Focus Legumes in Uganda

<table>
<thead>
<tr>
<th>Year</th>
<th>Cowpea</th>
<th>Soybean</th>
<th>Groundnut</th>
<th>Common Bean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>0.86</td>
<td>0.82</td>
<td>0.78</td>
<td>0.86</td>
</tr>
<tr>
<td>2006</td>
<td>0.82</td>
<td>0.80</td>
<td>0.78</td>
<td>0.82</td>
</tr>
<tr>
<td>2007</td>
<td>0.78</td>
<td>0.80</td>
<td>0.78</td>
<td>0.78</td>
</tr>
<tr>
<td>2008</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
<td>0.80</td>
</tr>
<tr>
<td>2009</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
</tr>
</tbody>
</table>

**CAGR ('05–'09)**
- Cowpea: 4.7%
- Soybean: 3.3%
- Groundnut: 3.9%
- Common Bean: -1.4%

### Production Trends and Drivers

#### Soybeans
- Improved soybean research funding
- Increased processing plants in North and East Uganda
- High market prices in Uganda in general encourage production as farmers receive good prices
  - Farmers shift to soybean from other legumes as soybean is less prone to pests and disease and they receive higher prices from processors

#### Groundnuts
- Grown mostly as a cash crop dominated by SHFs in north-eastern Uganda
  - Source of income for farmers who sell groundnuts for seed at good prices due to new varieties
- Good source of income for Internally Displaced Peoples

#### Common Beans
- Important source of food security and income generation
- Production has been declining due to poor yield, disease and pests, unfavorable climatic conditions and a shift to produce more lucrative crops such as fruits and vegetables

Note: 1 Populations living in camps set up by security agents due to displacement from their homes in the North East by rebel insurgencies and cattle rustlers

LEGUME MARKET OVERVIEW

PRODUCTION OVERVIEW — LAND AREA

Legumes are grown on 19% of land cultivated with food crops; an increase in land cultivated with legumes is driving marginal increases in production

Area Harvested of Focus Legumes in Uganda

<table>
<thead>
<tr>
<th>Year</th>
<th>Cowpea</th>
<th>Soybean</th>
<th>Groundnut</th>
<th>Common Bean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1,268</td>
<td>1%</td>
<td>3%</td>
<td>12%</td>
</tr>
<tr>
<td>2006</td>
<td>1,295</td>
<td>1%</td>
<td>3%</td>
<td>12%</td>
</tr>
<tr>
<td>2007</td>
<td>1,324</td>
<td>1%</td>
<td>3%</td>
<td>12%</td>
</tr>
<tr>
<td>2008</td>
<td>1,362</td>
<td>1%</td>
<td>3%</td>
<td>13%</td>
</tr>
<tr>
<td>2009</td>
<td>1,405</td>
<td>1%</td>
<td>3%</td>
<td>13%</td>
</tr>
</tbody>
</table>

CAGR (’05–’09)

- Cowpea: 2%
- Soybean: 1%
- Groundnut: 3%
- Common Bean: 3%

Trends and Drivers

- 19% of land cultivated with food crops is dedicated to legumes
- Total land cultivated with food crops and land under legume production has increased marginally due to a drive to increase production to benefit from high market prices
  - Yields are generally low, necessitating an increase in area harvested to increase production
- Some uncertainty around the availability of land/land tenure
  - Government previously evicted populations from their homelands to exclude human activities and declare land as protected forests

Note: ¹ Smallholders are defined as having landholding less than 2 hectares and 75% of legume cultivation is assumed to be by smallholders

Source: "Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) Statistical Abstract", 2010; Monitor Analysis
Common beans and groundnuts are the most widely grown legumes; common bean is primarily intercropped

Number of Plots\(^1\) by Crop, 2009 ( Millions)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Number of Plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Bean</td>
<td>2.30</td>
</tr>
<tr>
<td>Groundnut</td>
<td>1.40</td>
</tr>
<tr>
<td>Soybean</td>
<td>0.11</td>
</tr>
<tr>
<td>Cowpea</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Number of plots can be assumed to be equivalent to the number of farmers farming each crop.

Mean Plot Size\(^2\) by Crop, 2009 (Hectares)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Mean Plot Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td>0.34</td>
</tr>
<tr>
<td>Cowpea</td>
<td>0.31</td>
</tr>
<tr>
<td>Common Bean</td>
<td>0.27</td>
</tr>
<tr>
<td>Groundnut</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Cropping System by Crop, 2009

<table>
<thead>
<tr>
<th>Crop</th>
<th>Monocropped</th>
<th>Intercropped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Bean</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>Cowpea</td>
<td>74%</td>
<td>26%</td>
</tr>
<tr>
<td>Groundnut</td>
<td>48%</td>
<td>52%</td>
</tr>
<tr>
<td>Soybean</td>
<td>58%</td>
<td>42%</td>
</tr>
</tbody>
</table>

As profitability increases farmers are more likely to shift to monocropping.

Note: 1 A piece of land within a farmer's landholding on which a specific crop or a crop mixture is grown


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Yields are declining due to poor weather and limited use of crop-enhancing inputs as well as limited focus and attention from government. As a result, farmers are shifting focus to more lucrative crops.

**Trends and Drivers**

- **Unfavorable weather conditions**
- **Declining soil fertility due to limited use of crop-enhancing inputs**, e.g., fertilizer and pesticides
  - Poor distribution networks
  - High cost of inputs
  - Limited availability of inputs
  - Low participation of private sector input players
  - High transaction costs due to low volumes
  - Restrictions on agrochemicals with bureaucratic application process with the Agricultural Chemical Control Board

- **Limited investment in legumes by farmers**
  - Legumes are less profitable than other crops

- **Limited cultivation**
  - A number of farmers leave farming to search for employment in urban areas

- **Poor extension services**
  - Old farming systems and practices still used as training, research, etc are limited

- **Lack of governmental focus on legumes**
  - Government primarily encourages farmers to engage in fisheries, livestock, and the cultivation of fruits and vegetables; legumes receive limited attention

Despite the importance of common bean in Uganda, yields are significantly lower than their potential.

**Soybean Yield Gap: Uganda vs. Comparables**

- Yields have declined and moved erratically over the past 20 years.
- Yields in Burundi and Sri Lanka indicate that there exists potential to increase production without increasing land allocated to common beans.

**Uganda Potential Soybean Yield, Production Volume and Nutritional Impact**

<table>
<thead>
<tr>
<th>Region</th>
<th>Yield (MT/ha)</th>
<th>Production (Thousand Metric Tons)</th>
<th>Consumption per Capita (KG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Africa Max</td>
<td>1.2</td>
<td>1,071</td>
<td>29.7</td>
</tr>
<tr>
<td>South Asia Max</td>
<td>1.1 +133%</td>
<td>1,058</td>
<td>29.4</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.5</td>
<td>460</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Note: ¹ Yield comparison is versus maximum- and minimum-yielding among countries in East Africa and maximum-yielding country in South Asia; ² Local max reflects yield of the highest-yielding region/state in Uganda; ³ Based on primary research indicating that all common beans produced are consumed by people.

Source: AgDev; FAOSTAT; Monitor Analysis.
LEGUME MARKET OVERVIEW

CLOSING THE GROUNDNUT YIELD GAP

Groundnut yields have declined and currently lie well below those achieved in other East African countries

Groundnut Yield Gap: Uganda vs. Comparables

- Yields between 0.9 MT/ha and 0.6 MT/ha over the last 20 years; 0.7 MT/ha most recently
- Yields have steadily declined over time
- In-country, the Mbale region achieves the highest yields (0.8 MT/ha), well below the potential yield for East Africa

Uganda Potential Groundnut Yield, Production Volume and Nutritional Impact

Note: ¹ Yield comparison is versus maximum- and minimum-yielding among countries in East Africa and maximum-yielding country in South Asia; ² Local max reflects yield of the highest-yielding region/state in Uganda

Source: AgDev; FAOSTAT; Monitor Analysis; “Genetic Resistance a Key to Controlling Aflatoxin”, USDA; “Groundnut post-harvest operations”, FAO, 2002
Yields in Uganda have traditionally been comparable with other East African countries, however have not enjoyed the recent growth seen in other countries.

**Soybean Yield Gap: Uganda vs. Comparables**

- Yields between 0.9 MT/ha and 1.2 MT/ha over the last 20 years; 1.1 MT/ha most recently
  - Yields have remained relatively flat throughout
- Within Uganda, yields are highly variable
  - Bundibugyo: 2.082 MT/ha
  - Kalangala: 0.7 MT/ha

**Uganda Potential Soybean Yield, Production Volume and Nutritional Impact**

- **Local Max**: 
  - 2.1 MT/ha
- **South Asia Max**: 
  - 1.7 MT/ha
- **East Africa Max**: 
  - 1.5 MT/ha
  - +36%
- **Uganda**: 
  - 1.1 MT/ha

- **Production**
  - **Kenya**: 265 Thousand Metric Tons
  - **Ethiopia**: 237 Thousand Metric Tons
  - **Bangladesh**: 323 Thousand Metric Tons
  - **Uganda**: 175 Thousand Metric Tons

- **Consumption per Capita/Month**
  - **Kenya**: 4.2 KG
  - **Ethiopia**: 3.8 KG
  - **Bangladesh**: 5.1 KG
  - **Uganda**: 2.8 KG

Note: 1 Yield comparison is versus maximum- and minimum-yielding among countries in East Africa and maximum-yielding country in South Asia; 2 Local max reflects yield of the highest-yielding region/state in Uganda
Source: AgDev; FAOSTAT; Monitor Analysis
Cowpea yields in Uganda have traditionally been higher than most East African countries and have continued to rise over the past 20 years.

- Yields are high and growing
- Sri Lanka, the country with the highest yields in South Asia has achieved very similar yields to those in Uganda over the past 20 years

Note: 1 Yield comparison is versus maximum- and minimum-yielding among countries in East Africa and maximum-yielding country in South Asia; 2 Cowpea consumption data omitted due to the lack of official trade data
Source: AgDev; FAOSTAT; Monitor Analysis; “Cowpea: Post-Harvest Operations”, FAO, 2004
LEGUME MARKET OVERVIEW

LEGUME, CEREAL & CASH CROP COMPARISON

Legume production volumes have increased at a similar rate to those of Uganda’s main cash crop and cereals; increase in area harvested is a result of cultivating new land.

- **Production (Million Tons)**
  - | Year | Cereals | Legumes |
  - | 2000 | 1.95 | 2.70 |
  - | 2002 | 2.00 | 2.55 |
  - | 2004 | 2.05 | 2.50 |
  - | 2006 | 2.10 | 2.45 |
  - | 2008 | 2.15 | 2.40 |

- **Production (Thousand Tons)**
  - | Year | Cereals | Legumes |
  - | 2000 | 1.00 | 0.95 |
  - | 2002 | 1.05 | 0.90 |
  - | 2004 | 1.10 | 0.85 |
  - | 2006 | 1.15 | 0.80 |
  - | 2008 | 1.20 | 0.75 |

- **Area Harvested (Million Hectares)**
  - | Year | Cereals | Legumes |
  - | 2000 | 1.20 | 1.55 |
  - | 2002 | 1.25 | 1.50 |
  - | 2004 | 1.30 | 1.45 |
  - | 2006 | 1.35 | 1.40 |
  - | 2008 | 1.40 | 1.35 |

**Note:**
1. Cereals include maize, sorghum and millet; 2. Legumes include groundnut, cowpea and soybean

Source: FAOStat Official; Primary Research
Uganda is a significant net exporter of legumes, especially common bean — this creates competition for the domestic market and, combined with low production growth, leads to increased prices in the local market.

**Legume Imports and Exports in Uganda**

- **Imports (CAGR: 23%)**
- **Exports (CAGR: 0%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>2007</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>2008</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>2009</td>
<td>46</td>
<td>5</td>
</tr>
<tr>
<td>2010</td>
<td>28</td>
<td>28</td>
</tr>
</tbody>
</table>

**Ugandan Net Exports by Crop (Metric Tons)**

- **Groundnut**
  - 2006: 51
  - 2007: -285
  - 2008: -2,658
  - 2009: -9,969
  - 2010: -4,651

- **Chickpea**
  - 2006: -4
  - 2007: -6
  - 2008: 62
  - 2009: 27
  - 2010: 909

- **Soybean**
  - 2006: 2,407
  - 2007: 5,693
  - 2008: 3,268
  - 2009: 4,940
  - 2010: 7,748

- **Common Bean**
  - 2006: 24,013
  - 2007: 8,351
  - 2008: 28,144
  - 2009: 41,129
  - 2010: 18,399

**Note:**
1. All trade reported is official data, which can be misleading due to the large amount of informal and unofficial trade;
2. Legumes include common beans, chickpeas, soybeans and groundnuts for which trade data was available;
3. Groundnut and soybean import and export data include trade of raw groundnut and soybean as well as processed oil and cake;
4. Common Bean includes kidney, white pea, dried, adzuki, urd, mung and black/green gram beans; Cowpea trade data is unavailable.

Source: International Trade Centre (ITC), Trade Map, accessed 26 February 2012; Monitor Analysis.
Tanzania is an important source of soybeans and groundnuts, while common beans are imported both regionally and internationally.

**Top Import Destinations by Crop, Average per Annum (2006–2010)**

- Uganda imports a small amount of common bean from Rwanda
  - This is likely understated due to informal nature of legume trade in the region
  - The bulk of these imports are likely to be in border towns
  - Varieties could also differ with Uganda importing different varieties to what is grown locally

Source: International Trade Centre (ITC), Trade Map, Accessed 18 January 2012; Monitor Analysis
Uganda plays a significant role in supplying the East African region with legumes, with the most exports going to Kenya, Sudan, and the DRC.

**Top Export Destinations by Crop, Average per Annum (2006–2010)**

- **The bulk of trade is regional — mostly beans entering Kenya**
  - High demand for beans in Kenya as demand far outstrips production
  - Bean exports to Sudan and the DRC as well
  - Soy is also exported to Kenya (in the form of soycake), Rwanda, Tanzania, Congo, and DRC

- **High level of informal trade (~84% of all trade)**
  - Numerous bureaucratic procedures (on both sides) to get produce across borders
  - Reluctance of traders to pay high clearance fees

- **Limited export of groundnut to Europe & North America due to aflatoxin levels**
  - However, not a concern at the local level

Source: International Trade Centre (ITC), Trade Map, accessed 18 January 2012; Monitor Analysis
LEGUME MARKET OVERVIEW

LEGUME BUYERS

There are very few large commercial buyers of legumes as most trade occurs through small-scale traders; low quality legume output is at the center of a self-perpetuating cycle

- Poor quality and inconsistent production constrains large-scale commercial buyers from entering the market
- All purchasing is done by small-scale informal traders, many of whom sell their produce throughout the region
- Quality is not a major determinant of demand, as a result of the high demand for cheap sources of protein throughout the region
- Farmers are not incentivized to adopt improved varieties and invest in other yield enhancing inputs

Poor Quality

Small-Scale Traders

Determinants of Demand

No Incentives

"No large enterprises are prepared to invest in Uganda because of the low and inconsistent yields of legumes farmers, at the same time farmers don’t want to buy improved varieties because they know they can sell traditional variety produce to informal traders."

- David Okuello (Industry Expert)

WFP

- The World Food Programme is the one major buyer of legumes in Uganda
- The WFP procured beans and a corn soya blend from SHFs in the following quantities in 2010:
  - Beans: 9,401 MT
  - Corn-Soya Blend: 8,181 MT
- These foods are distributed throughout East Africa

Source: Primary Interviews
The legumes value chain is fragmented with little coordination amongst players both horizontally and vertically — this leads to inefficient marketing of produce and high transaction costs.

Note: 1 African Research and Documentation Centre; 2 National Agricultural Research Organization; 3 International Centre for Tropical Agriculture; 4 Serere Animal and Agricultural Research Institute; 5 Kawanda Agricultural Research Institute

### LEGUME MARKET OVERVIEW

#### PREFERRED TRAITS ALONG THE VALUE CHAIN

The most important trait for common bean and groundnut appears to be color; taste is also an important factor

<table>
<thead>
<tr>
<th>Trait¹</th>
<th>Common Bean</th>
<th>Groundnut</th>
<th>Soybean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color</strong></td>
<td>- Population favors lighter colored beans</td>
<td>- Light red nuts are preferred</td>
<td>- n/a</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>- Medium to large beans are preferred</td>
<td>- Less important as most of groundnut is processed into pastes and powders</td>
<td>- n/a</td>
</tr>
<tr>
<td><strong>Shape</strong></td>
<td>- Round or kidney shaped beans</td>
<td>- Less important as most of groundnut is processed into pastes and powders</td>
<td>- n/a</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>- n/a</td>
<td>- Oil content</td>
<td>- Shattering (farmers prefer varieties that remain closed until harvesting)</td>
</tr>
</tbody>
</table>

Taste is also a significant factor in the market

“Ugandans are extremely conservative when it comes to taste. They like things the way they taste and they are very unlikely to shift to new tastes — it’s just not what we do.”

– Pamela Nahamya, Crop Scientist

Note: ¹ All preferences refer to those of the end consumer
Source: Primary Interviews; Monitor Analysis
## LEGUME MARKET OVERVIEW

### ACTIVITIES ALONG THE VALUE CHAIN BY PLAYER

There are four key product ‘channels’ in the marketing of legumes in Uganda.

<table>
<thead>
<tr>
<th>Integrated Smallholder Farmers</th>
<th>Commercial Farmers</th>
<th>Processors</th>
<th>Traders</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Small farmers producing food crops on a <strong>subsistence level</strong>, constituting about 90% of supply in the country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Generally undercapitalized with <strong>low levels of technology</strong> (rudimentary tools such as hoes and pangas)</td>
<td></td>
<td>No large scale processors — processing mainly by town traders and wholesalers to add value before sale</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Beans are dried, sorted and packed,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Groundnuts are processed into pastes and powder using a manual mortar or motorized grinders</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Processed products <strong>sold at point of processing</strong> (often market places and often at a high price)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Market for processed products minimal in the rural areas</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Rural intermediaries <strong>aggregate supplies from producers for re-sale</strong> mostly to retailers in urban markets</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Urban intermediaries <strong>aggregate supply from producers in rural markets for final sale to consumers mostly in urban markets</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Some transact with other large players procuring for institutions and export to regional markets</td>
</tr>
</tbody>
</table>

---

*Source: ‘Grains sub sector analysis report: beans, groundnuts, sorghum, and upland rice’, Shoreline Service Limited, 2007; Monitor Analysis*
**LEGUME MARKET OVERVIEW**

**VALUE CHAIN ECONOMICS — PRODUCTION**

Labour is the highest cost facing SHFs at 64% and 54% of total production costs for common bean and groundnut respectively; increased mechanization would significantly decrease costs for SHFs.

---

**Cost of Production for Common Bean in South West Uganda, 2007 (USD/Ha)**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land clearing</td>
<td>119</td>
</tr>
<tr>
<td>Seed 40 kg</td>
<td>89</td>
</tr>
<tr>
<td>1st ploughing</td>
<td>178</td>
</tr>
<tr>
<td>2nd ploughing</td>
<td>222</td>
</tr>
<tr>
<td>1st weeding</td>
<td>44</td>
</tr>
<tr>
<td>2nd weeding</td>
<td>30</td>
</tr>
<tr>
<td>Planting</td>
<td>74</td>
</tr>
<tr>
<td>Harvesting</td>
<td>30</td>
</tr>
<tr>
<td>Loading to homes</td>
<td>22</td>
</tr>
<tr>
<td>Processing</td>
<td>15</td>
</tr>
<tr>
<td>Sorting and grading</td>
<td>15</td>
</tr>
<tr>
<td>Bags</td>
<td>13</td>
</tr>
<tr>
<td>Pesticides</td>
<td>1</td>
</tr>
<tr>
<td>Storage</td>
<td>44</td>
</tr>
<tr>
<td>Total cost of production</td>
<td>897</td>
</tr>
</tbody>
</table>

Labour Costs: 64% of Total Production Costs

---

**Cost of Production for Groundnut in Uganda, 2007 (USD/Ha)**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land rental</td>
<td>37</td>
</tr>
<tr>
<td>Other inputs</td>
<td>109</td>
</tr>
<tr>
<td>1st ploughing</td>
<td>22</td>
</tr>
<tr>
<td>2nd ploughing</td>
<td>15</td>
</tr>
<tr>
<td>Planting</td>
<td>37</td>
</tr>
<tr>
<td>1st weeding</td>
<td>44</td>
</tr>
<tr>
<td>2nd weeding</td>
<td>37</td>
</tr>
<tr>
<td>Harvesting</td>
<td>44</td>
</tr>
<tr>
<td>Plucking</td>
<td>39</td>
</tr>
<tr>
<td>Transport home</td>
<td>24</td>
</tr>
<tr>
<td>Drying</td>
<td>22</td>
</tr>
<tr>
<td>Cleaning</td>
<td>7</td>
</tr>
<tr>
<td>Bagging</td>
<td>5</td>
</tr>
<tr>
<td>Total cost of production</td>
<td>444</td>
</tr>
</tbody>
</table>

Labour Costs: 54% of Total Production Costs

---

Source: ‘Grains sub sector analysis report: beans, groundnuts, sorghum, and upland rice’, Shoreline Service Limited, 2007; Monitor Analysis
In the common bean value chain, middlemen and agents make net margins of 28% and 21% respectively — these margins could be passed onto farmers by improving linkages to markets.

Marketing Costs and Margins\(^1\) for Select Actors in the Common Bean Value Chain (USD)

- **Middlemen (28% Net Margin)**
- **Agents (21% Net Margin)**
- **Exporters\(^2\) (23% Net Margin)**

Marketing Margins for Select Actors in the Groundnut Value Chain (USD)

- **Producer**
- **Market Seller (10% Margin)**
- **Rural Trader (13% Margin)**
- **Wholesaler (15% Margin)**
- **Retailer (7% Margin)**

Note: \(^1\) All costs, margins and prices apply to a 100KG bag; \(^2\) Exporters cost, margins and selling prices are calculated as an average of exporters exporting to Kampala and those exporting to Kenya; USD/Ksh exchange rate average for 2010: 0.0122; USD/Ush exchange rate average for 2007: 0.0006


- Groundnut prices in the local market are generally higher than in international markets, e.g., in 2002, the market price for groundnuts in Rotterdam was $0.54/KG while in Uganda it was $0.84/KG.
- The range of prices between domestic regions is decreasing signifying improved information, ease of accessing markets and the constant movement of produce.