Sector Analysis Studies for the Commercial Agriculture for Smallholders and Agribusiness Programme

Uganda: Country Value Chain and Market Analysis Report

Submitted to the IMC led EACDS Lot C framework (PO 7468) by LTS International Limited in partnership with Cardno Emerging Markets UK Limited

20 November 2017
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<tr>
<th>Acronym</th>
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<tr>
<td>ASSP</td>
<td>Agricultural Sector Strategic Plan</td>
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<td>ACE</td>
<td>Area Cooperative Enterprises</td>
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<td>AfDB</td>
<td>African Development Bank</td>
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<td>CASA</td>
<td>Commercial Agriculture for Smallholders and Agribusiness Programme</td>
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<td>COCTU</td>
<td>Coordinating Office for the Control of Trypanosomiasis in Uganda</td>
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<td>CCFU</td>
<td>Cross Cultural Foundation of Uganda</td>
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<td>CDC</td>
<td>Commonwealth Development Corporation</td>
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<td>CDO</td>
<td>Cotton Development Organisation</td>
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<td>CEDO</td>
<td>Community Enterprises Development Organization</td>
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<td>DFID</td>
<td>Department for International Development</td>
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<td>DDA</td>
<td>Dairy Development Authority</td>
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<td>EAC</td>
<td>East African Community</td>
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<td>FAO</td>
<td>Food and Agriculture Organisation of the United Nations</td>
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<td>FEWS NET</td>
<td>Famine Early Warning Systems Network</td>
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<td>FSNWG</td>
<td>Food Security and Nutrition Working Group</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>HDR</td>
<td>Human Development Report</td>
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<td>IFAD</td>
<td>International Fund for Agriculture and Development</td>
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<td>IDA</td>
<td>International Development Association of the World Bank</td>
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<td>JICA</td>
<td>Japanese International Cooperation Agency</td>
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<td>MAAIF</td>
<td>Ministry of Agriculture Animal Industry and Fisheries</td>
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<td>MoFPED</td>
<td>Ministry of Finance Planning and Economic Development</td>
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<td>MWE</td>
<td>Ministry of Water and Environment, Uganda</td>
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<td>NAP</td>
<td>National Agriculture Plan</td>
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<td>NARO</td>
<td>National Agriculture Research Organisation</td>
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<td>NASECO</td>
<td>Nalwego Seed Company Ltd</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>NUAC</td>
<td>Northern Uganda Agriculture Centre</td>
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<td>NAADS</td>
<td>National Agriculture Advisory Services</td>
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<td>NGOs</td>
<td>Non-Governmental Organisations</td>
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<tr>
<td>NAACRI</td>
<td>National Crops Resources Research Institute</td>
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<td>NRDS</td>
<td>National Rice Development Strategy</td>
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<td>ODA</td>
<td>Official Development Assistance</td>
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<td>OECD</td>
<td>Organisation of Economic Cooperation and Development</td>
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<td>PMA</td>
<td>Plan for Modernisation of Agricultural Secretariat</td>
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<td>RMCU</td>
<td>Rice Millers Council of Uganda</td>
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<td>SMEs</td>
<td>Small and Medium Enterprises</td>
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<td>SAME</td>
<td>Smallholder Agriculture Marketing Enterprise</td>
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<tr>
<td>UBOS</td>
<td>Uganda Bureau of Statistics</td>
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<td>UCDA</td>
<td>Uganda Coffee Development Authority</td>
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<td>UEPB</td>
<td>Uganda Export Promotion Board</td>
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<td>UEAX</td>
<td>Uganda East Africa Exchange</td>
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<td>UGX</td>
<td>Ugandan Shillings</td>
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<td>UNADA</td>
<td>Uganda National Agro-input Dealers Association</td>
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<tr>
<td>UNAS</td>
<td>Uganda National Household Survey</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>WRS</td>
<td>Warehouse Receipts System</td>
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</tbody>
</table>
EXECUTIVE SUMMARY.......................................................................................................................... 1

1. INTRODUCTION .................................................................................................................................. 6
   1.1 STUDY OBJECTIVES ......................................................................................................................... 6
   1.2 METHODOLOGY ............................................................................................................................... 6

2. BACKGROUND ..................................................................................................................................... 8
   2.1 SOCIO-ECONOMIC SETTING .......................................................................................................... 8
   2.2 AGRICULTURE SECTOR PERFORMANCE .................................................................................. 8
   2.3 DONOR LANDSCAPE ....................................................................................................................... 10

3. PRODUCTION AND CONSUMPTION ................................................................................................. 12
   3.1 BEANS (PHASEOLUS VULGARIS) .................................................................................................. 12
      3.1.1 Production ................................................................................................................................. 12
      3.1.2 Consumption ............................................................................................................................ 13
      3.1.3 Market Constraints .................................................................................................................. 14
   3.2 RICE ................................................................................................................................................ 14
      3.2.1 Production ................................................................................................................................. 14
      3.2.2 Consumption ............................................................................................................................ 15
      3.2.3 Market Constraints .................................................................................................................. 16
   3.3 SESAME ......................................................................................................................................... 16
      3.3.1 Production ................................................................................................................................. 16
      3.3.2 Consumption ............................................................................................................................ 18
      3.3.3 Market constraints ................................................................................................................... 20

4. DEVELOPMENT CHARACTERISTICS ............................................................................................. 22
   4.1 GENDER .......................................................................................................................................... 22
      4.1.1 Beans ....................................................................................................................................... 22
      4.1.2 Rice ......................................................................................................................................... 23
      4.1.3 Sesame .................................................................................................................................... 24
   4.2 NUTRITION .................................................................................................................................... 25
      4.2.1 Beans ....................................................................................................................................... 26
      4.2.2 Rice ......................................................................................................................................... 26
      4.2.3 Sesame .................................................................................................................................... 26
   4.3 CLIMATE CHANGE ......................................................................................................................... 27
      4.3.1 Beans ....................................................................................................................................... 27
      4.3.2 Rice ......................................................................................................................................... 27
      4.3.3 Sesame .................................................................................................................................... 28

5. MARKET LINKAGES ............................................................................................................................ 30
   5.1 SPATIAL AND INSTITUTIONAL COMMODITY FLOWS .................................................................. 30
      5.1.1 Beans ....................................................................................................................................... 30
      5.1.2 Rice ......................................................................................................................................... 31
      5.1.3 Sesame .................................................................................................................................... 32
   5.2 STAKEHOLDER ANALYSIS ............................................................................................................. 33
      5.2.1 Beans ....................................................................................................................................... 33
      5.2.2 Rice ......................................................................................................................................... 34
      5.2.3 Sesame .................................................................................................................................... 35
   5.3 KEY BUSINESSES IN THE BEANS, RICE AND SESAME SUB-SECTORS ...................................... 36
   5.4 FINANCIAL PERFORMANCE ALONG THE MARKETING CHAIN .................................................. 38
      5.4.1 Beans ....................................................................................................................................... 38
      5.4.2 Rice ......................................................................................................................................... 39
      5.4.3 Sesame .................................................................................................................................... 40

6. MARKET FUNCTIONS .......................................................................................................................... 41
   6.1 TRANSPORT .................................................................................................................................... 41
6.2 PROCESSING .................................................................................................................. 41
  6.2.1 Beans ...................................................................................................................... 41
  6.2.2 Rice ........................................................................................................................ 41
  6.2.3 Sesame ................................................................................................................... 42
6.3 STORAGE ......................................................................................................................... 42
6.4 COMMODITY EXCHANGE ............................................................................................ 42
6.5 INTRA-FIRM ORGANISATION ..................................................................................... 43
  6.5.1 Horizontal and Vertical Linkages - Beans ............................................................... 43
  6.5.2 Horizontal and Vertical Linkages - Rice ................................................................. 43
  6.5.3 Horizontal and Vertical Linkages - Sesame ............................................................ 43

7. FINANCE AND INVESTMENT ......................................................................................... 44
  7.1 Farmer Finance ............................................................................................................ 44
  7.2 SMAE Finance ............................................................................................................ 45
  7.3 PRIVATE SECTOR INVESTMENT ................................................................................ 45
  7.4 GOVERNMENT AND DONOR INVESTMENT ............................................................ 46

8. ENABLING ENVIRONMENT ......................................................................................... 48
  8.1 GOVERNMENT INSTITUTIONS, POLICY, STRATEGY AND PROGRAMMES ............ 48
  8.2 NON-GOVERNMENTAL AND PRIVATE SECTOR ORGANISATIONS .................... 50
    8.2.1 Market interventions .......................................................................................... 51
  8.3 REGULATORY FRAMEWORK ..................................................................................... 52
  8.4 INFRASTRUCTURE AND UTILITIES ........................................................................ 53

9. POTENTIAL INTERVENTIONS ......................................................................................... 54
  9.1 SESAME ...................................................................................................................... 54
    9.1.1 Linking Smallholders with Markets and Agribusinesses ................................. 54
    9.1.2 Supporting Agribusiness to Prepare for Investment .......................................... 54
    9.1.3 Enabling Environment ....................................................................................... 54
  9.2 RICE ........................................................................................................................... 55
    9.2.1 Linking Smallholders with Markets and Agribusinesses ................................. 55
    9.2.2 Supporting Agribusiness to Prepare for Investment .......................................... 55
    9.2.3 Enabling Environment ....................................................................................... 55
  9.3 BEANS ....................................................................................................................... 56
    9.3.1 Linking Smallholders with Markets and Agribusinesses ................................. 56
    9.3.2 Supporting Agribusiness to Prepare for Investment .......................................... 56
    9.3.3 Enabling Environment ....................................................................................... 56

10. RECOMMENDATIONS .................................................................................................. 57
  10.1 INCREASING THE QUALITY AND QUANTITY OF SESAME SEED OFFERED FOR SALE ........................................................................................................... 57
  10.2 INCREASING THE QUALITY AND QUANTITY OF RICE OFFERED FOR SALE ......................................................................................................................... 57
  10.3 INCREASING THE QUALITY AND QUANTITY OF BEANS OFFERED FOR SALE ................................................................................................................. 57
  10.4 POTENTIAL SME PARTNERS .................................................................................... 57

11. ANNEXES ...................................................................................................................... 59
  ANNEX A: BIBLIOGRAPHY OF VALUE CHAIN RESOURCES .................................... 59
  ANNEX B: STAKEHOLDERS CONSULTED, BEANS AND RICE ..................................... 61
  ANNEX C: STAKEHOLDERS CONSULTED, SESAME .................................................... 67
  ANNEX D: REVIEW WORKSHOP PARTICIPANTS AND SUMMARY ........................... 68
Executive Summary

This study commissioned by the Department for International Development (DFID) is focused on the Commercial Agriculture for Smallholders and Agribusiness programme (CASA). The primary objective of this study is to enable DFID to identify the value chains, sub-national regions and stakeholders to form the basis for CASA’s country level interventions and use this information to develop the Terms of Reference for the implementation of the CASA programme.

In Uganda, the study identified sesame, beans and rice value chains as the most relevant to design short-term interventions to enhance pre-existing strengths within the value chains. The recommendations of the study are as follows:

1. Value Chain 1: Sesame

1.1 Linking Smallholders with Markets and Agribusinesses

Investment 1: Promotion of improved sesame varieties

CASA could facilitate a smallholder-based improved sesame seed multiplication programme. Gulu would be a suitable venue for a pilot programme, in partnership with NU-TEC. A firm such as the Gulu Agricultural Development Company (GADC) would work with Gulu Farmers and Produce Dealers Association (GFPDA), obtaining foundation seed from the National Agricultural Research Organisation (NARO). The seed would be collectively multiplied by selected farmers’ groups for sale to other producers, with the necessary technical knowledge disseminated by GADC. Cooperatives could be facilitated to obtain credit on behalf of members for procurement of improved seeds and tractor hire services.

Investment 2: Strengthened horizontal linkages for smallholder sesame producers

In order to facilitate collective input purchase and output marketing, CASA could support GFPDA to strengthen and/or create farmers’ associations, or cooperative societies, in each of six districts in Gulu as a pilot project. Ultimately, the model could be replicated in Lira and other sub-regions of Northern Uganda. The associations or societies would engage in assembling, cleaning, grading and storage of sesame for sale to buyers such as Olam, ETG, AgriExim, Shares! and Lira Resort. GADC could provide farmer training in post-harvest handling and agribusiness.

1.2 Supporting Agribusiness to Prepare for Investment

Investment 1: Capacity building of sesame traders

Poor quality sesame outputs are often the result of poor handling and storage practices by traders. In order to develop these trading businesses and make them a more attractive investment prospect, CASA could facilitate training in good practices by GADC, while investigating potential sources of small loans for upgrading of infrastructure such as storage and marketing premises, weighing scales, tarpaulins, and so on.

1.3 Enabling Environment

Several buyers – including Shares! and AgriExim – would like to source organic sesame in Uganda. This higher value product is not subject to the same price volatility as conventional sesame and commands a premium. However, there are conflicts among organic food production and other activities, notably the GoU’s malaria control programmes through the Ministry of Health, in which large swathes of rural areas are treated with insecticides, notably DDT, contaminating crops and rendering them in violation of organic production standards.
The National Organic Agricultural Movement of Uganda (NOGAMU) and Uganda Oil Seed Producers and Processors Association (UOSPPA) are two examples of stakeholder organisations that could engage in dialogue among their member organisations and local and national Government to examine instances where development and land use priorities are conflicted.

In 2016, Trademark Africa worked with the Southern and Eastern Africa Trade Information and Negotiations Institute (SEATINI) to develop a standard for sesame. There may be an opportunity for CASA to support the implementation of this standard.

1.4 Impact

With inputs of facilitation and technical assistance from CASA, a pilot could initially target 30,000 farmers in six districts of Gulu. Given that sesame seed is planted at rates of 1-2 kg/acre (around 2.5-5kg/ha), and assuming that each 2kg planted yields at least 200kg to be distributed to farmers, the output would be 4,000MT at the end of year two.

By using improved seed with the correct agricultural practices, smallholders’ yields could increase from 100MT/acre (247MT/ha) to 300MT/acre (741MT/ha). Marketable surpluses might increase from 63% to 75%. In addition, post-harvest losses could be reduced by 10% along the value chain. We estimate that these changes could result in 30% income increases to sesame producing households, equivalent to around USD24/smallholder/year, through increased sales as the result of greater productivity and lower loss levels, all else being equal (sesame global market prices are somewhat volatile).

2. Value Chain 2: Rice

2.1 Linking Smallholders with Markets and Agribusinesses

Investment 1: Promotion of use of improved rice inputs to enhance productivity

CASA could promote use of improved rice varieties and fertilizer among project farmers in order to increase rice productivity and production, working in partnership with JICA, rice buyers and NARO, which could supply OPV foundation seed, and selected farmers’ groups. Seed could be distributed to farmers by buyers under the “One Kilogramme” model, in which recipients of one kilogramme of improved seed promise to provide the same quantity to group members upon harvest. Other financing models for sustainable linkage to seed sources could also be investigated with implementing partners during the project design phase. OPV seed could be recycled for two years.

For fertilisers, CASA could work to support the World Bank funded Agricultural Cluster Development Project (ACDP) in Ministry of Agriculture Animal Industry and Fisheries (MAAIF), in which licensed private companies deliver and sell it to farmers at their cooperatives under an e-voucher system. The International Fertiliser Development Centre (IFDC) and MAAIF could provide technical support in best practices for fertiliser use. Cooperatives could be facilitated to mobilize agricultural credit for members.

Investment 2: Enhancement of rice post-harvest handling, value addition, and marketing

In partnership with MAAIF, the Ministry of Trade, Industry and Co-operatives (MTIC), and rice buyers, CASA could facilitate capacity building of farmers’ groups and associations to become cooperative societies that will engage in collective marketing of produce in each district. The societies would take on the functions of assembly, cleaning, grading, and improved storage of rice. Three medium-sized rice millers (Pearl, Divine Masters and Eastern Rice) are potential partners for piloting a forward marketing contract system. Market information could be provided to farmers, traders, and millers under a public private partnership between MAAIF, MTIC and private market information service providers such FIT (U) Ltd.
2.2 Supporting Agribusiness to Prepare for Investment

**Investment 1: Capacity building of traders and millers for enhanced rice quality**

CASA could provide rice buyers and processors with technical assistance on attaining quality standards, and linked to loan facilities to procure post-harvest handling equipment, such as moisture meters, and more modern processing machinery, such as de-stoners.

2.3 Enabling Environment

Rice production requires large volumes of water and has been associated with wetland destruction. There is also the potential for pollution (nutrient enrichment leading to ecosystem change) from fertiliser run-off and, for upland rice, for further deforestation from “slash and burn” shifting agriculture. There needs to be dialogue between the National Environmental Management Authority (NEMA), farmers’ representative groups, MAAIF, JICA and other interested stakeholders on eliminating or mitigating environmental damage, for example through standards in conservation agriculture and zoning of rice production according to impact assessments.

Secondly, there is a need to form an apex association for rice farmers – a National Rice Farmers’ Association – in order to represent producers’ interests to Government. In addition, the Uganda Rice Millers Council (URMC) could be strengthened. In the interim, the Rice Secretariat established with support from JICA could assist in bringing all rice value chain stakeholders together for policy dialogue, for example in land use planning conflicts and brown import policy.

2.4 Impact

CASA could potentially reach 15,000 farmers in three selected districts in eastern Uganda. Given that the rice seed multiplication rate is 100 and seed rate is 50kg/acre (123kg/ha), assuming that 1kg of planted seed yields at least 50kg output, 1 acre would output 2.5MT (6.2MT/ha) in one year (one growing season). Farmer adoption of fertiliser might reach 25% and productivity could rise from 2.5MT/acre (6.2MT/ha) to 4MT/acre (9.9MT/ha), around 80% of potential yield. Post-harvest losses might be expected to decline from 30% to 10% and a rice producing household could potentially increase income from rice by 50%, equivalent to around USD60-110/smallholder/year (depending on yield), based upon our assumptions of greater productivity, increased quality and better prices.

3. Value Chain 3: Common Beans

3.1 Linking Smallholders with Markets and Agribusinesses

**Investment 1: Promotion of use of improved inputs to enhance productivity and production**

CASA could promote use of improved bean varieties and fertilizer among project farmers in order to increase bean productivity and production, working in partnership with Volunteer Efforts for Development Concerns (VEDCO), bean buyers and NARO, which could supply foundation seed, and selected farmers’ groups. As with rice, seed could be distributed to farmers by buyers under the “one kilogramme” model, or other financing models for sustainable linkage to seed sources developed with implementing partners during the project design phase. A pilot would take place in the five districts in which VEDCO is currently operating.

Again in parallel to the rice intervention, CASA could work with ACDP, with support from MAAIF and cooperatives for credit supply and technical assistance.
Investment 2: Enhancement of beans post-harvest handling, value addition, and marketing

In partnership with MAAIF, the Ministry of Trade, Industry and Co-operatives (MTIC), VEDCO and bean buyers, CASA could facilitate capacity building of farmers' groups and associations to become cooperative societies that will engage in collective marketing of produce in each of five districts. The societies would take on the functions of assembly, cleaning, grading, and improved storage of beans. Buyers such as traders, Agroways, Upland Rice Millers and the UN WFP are potential partners, and VEDCO is a potential implementing partner for producer training. Market information could be provided to farmers, traders, and millers under a public private partnership between MAAIF), MTIC and private market information service providers such FIT (U) Ltd.

3.2 Supporting Agribusiness to Prepare for Investment

Investment 1: Formalisation and structuring of beans trade

To promote structured trading, bean traders/aggregators could be trained on post-harvest handling management and quality standards and linked with Agroways and Upland Rice Millers with modern equipment and technologies, such as grain driers and cleaners, moisture meters and triple bags. CASA could also facilitate strengthening of vertical relationships between traders at different levels so that market information flows improve and the marketing system is more responsive to end user preferences.

3.3 Enabling Environment

In order to foster policy dialogue, there is a need to form an apex association for bean farmers and traders at the national level – National Beans Farmers Association and National Beans Traders Association – in addition to strengthening the Beans Secretariat established with support from USAID.

3.4 Impact

We assume that the bean seed multiplication rate is 40 and seed rate is 40 kg/acre, 1 kg planted yields at least 20 kg, and that on giving back 1kg, a farmer retains 20kg that will plant 0.5 acre with total output of over 0.4 MT over two growing seasons. The proportion of project farmers using improved seeds and fertilisers might reach 75% and 25%, respectively. This would result in productivity increases from 500 MT/acre to 1,200 MT/acre (75% of potential yield) over two seasons, a 20% decline in post-harvest losses and an increase in marketable surplus from 20% to 50% in beneficiary farming households. This increased output (and, therefore assumed sales) and reduced losses might translate into an income increase of 50%, equivalent to around USD21/smallholder/year, all else being equal. Clearly, if there were large-scale increases in bean output, local prices may be depressed, depending upon demand side dynamics.

4. Potential SME partners

The table below identifies SMEs that were identified by the study as having potential for further engagement with the programme.

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<tr>
<th>Business</th>
<th>Sector</th>
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<tbody>
<tr>
<td>Agroways Ltd.</td>
<td>Beans</td>
<td>Operates in one of the major beans growing areas of Uganda (Busoga sub-region). Bean surpluses could be aggregated at farmer group level and delivered to Agroways for cleaning, drying, storage and sale, which has eight satellite stores managed by farmer groups.</td>
</tr>
<tr>
<td>Company</td>
<td>Product</td>
<td>Notes</td>
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</tr>
<tr>
<td>Upland Rice Millers Ltd.</td>
<td>Rice, beans</td>
<td>Also located in the Busoga sub-region, where both beans and rice are produced and traded.</td>
</tr>
<tr>
<td>Divine Masters Ltd.</td>
<td>Rice</td>
<td>Has stated plans to bring more smallholders into rice production.</td>
</tr>
<tr>
<td>Eastern Rice Company Ltd.</td>
<td>Rice</td>
<td>Has stated readiness to engage with more smallholder farmers if supported.</td>
</tr>
<tr>
<td>Pearl Rice</td>
<td>Rice</td>
<td>Will receive an IDB loan, but only for construction of dams.</td>
</tr>
<tr>
<td>Gulu Agricultural Development Company (GADC)</td>
<td>Sesame</td>
<td>Works with a large number of smallholders. Although it has received some previous DFI support, CASA could facilitate expansion of its smallholder engagement.</td>
</tr>
<tr>
<td>Lira Resort</td>
<td>Sesame</td>
<td>The only potential SME operating in the Lango sub-region, a major producer of sesame.</td>
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1. Introduction

1.1 Study Objectives

The Department for International Development (DFID) is in the process of finalising the terms of reference for the Commercial Agriculture for Smallholders and Agribusiness programme (CASA). It is envisaged that the programme will have four components: i) Country-level interventions; ii) Global knowledge and policy influencing activities; iii) Smallholder development facility; and iv) Community engagement activities.

The primary objective of this study is to enable DFID to identify the value chains, sub-national regions and stakeholders to form the basis for CASA’s country level interventions (Component 1) and to enable DFID to use this information to develop the Terms of Reference for the implementation of this component of the CASA programme. The objectives of the studies are to:

- Identify two value chains in Sierra Leone, Mozambique, Uganda, Tanzania, Malawi, Myanmar and Nepal which offer the best potential to increase economic opportunities for smallholder farmers.

- Identify potential interventions within the recommended value chains to develop commercial agriculture in line with the CASA objectives and approach. The studies will identify opportunities to:
  - Establish, support or expand smallholder aggregation and access to markets, particularly for poorer farmers, women and those not currently engaged in commercial agriculture.
  - Support SME agribusinesses with significant smallholder supply chains to prepare for and attract early stage investment;
  - Support organisations which bring together stakeholders to advocate for regulatory reform and identify possible reforms which would boost growth in the value chain and increase the ability of smallholders to participate in it.

In addition to conducting sector analysis studies, findings from the studies will be synthesised into an overall recommended scope of activity for CASA in three countries, of which one must be defined as a fragile or conflict affected state by DFID and one must be in Asia.¹

The purpose of this Country Sector Analysis Report is to i) describe selected value chains and detailed rationale for their selection; ii) provide examples of specific opportunities for intervention at the level of smallholder aggregation, supporting agribusinesses to prepare for investment and advancing enabling environment reforms; and iii), describe the existing donor landscape of activities within the value chain.

1.2 Methodology

This Country Sector Analysis Report is largely the result of three weeks fieldwork carried out between 14th August and 1st September, 2017 (beans and rice), and two weeks in November 2017. The majority of this work was carried out by the Study Country Lead, supported by the Core Consultant, who also participated in fieldwork between 5th September and 10th September, and, in the case of sesame, by a

¹ Terms of Reference: Sector Analysis Studies for the Commercial Agriculture for Smallholders and Agribusiness Programme
national consultant, who undertook additional fieldwork and provided inputs to a home-based international consultant.

The subject of the fieldwork, rice, beans and sesame were selected through a desk-based short-listing and scoring process. Firstly a long-list of value chains was prepared based on area grown and value of production. The long-list was assessed using 'Inclusion Criteria' to create a short-list (Ref: Value Chain Short-List Report) which was approved by DFID. The short-list was then assessed using a weighted scoring matrix (Ref: Short-Listed Value Chain Scoring Report) with the top two ranked value chains selected to undergo detailed fieldwork. The results of the ranking were shared and agreed with DFID Senior Advisors and Country Offices before fieldwork proceeded.

A Research Framework, provided in Annex C, was prepared to guide semi-structured interviews and focus group discussions with key value chain stakeholders. The Framework was reviewed by DFID Senior Advisors and revised according to their feedback before use.

Consultations with stakeholders in the main production areas included:

- Private sector investors, banks, private equity funds, impact investors, DFIs (e.g. CDC), AgdevCo, multinational companies;
- Agribusinesses;
- Producer organisations, cooperatives and other organisations representing smallholders;
- Key government officials from the Ministry of Agriculture, Ministry of Trade and other relevant ministries;
- NGOs and civil society organisations active in the value chain and in supporting smallholder market access;
- DFID country office advisers and staff from relevant commercial agriculture programmes, and;
- Other donors active in commercial agriculture and the proposed value chains.

A bibliography of documents reviewed is provided in Annex A and the full list of interviewees is presented in Annex B.

On 6 September 2017, during the latter part of the fieldwork period, a Review Workshop was held in Kampala with key value chain stakeholders with the purpose of soliciting feedback on the proposed interventions. A list of participants and summary of key points raised is included in Annex D.
2. Background

2.1 Socio-economic Setting

A land-locked country in East Africa, Uganda has a population of 38.3 million, with an estimated growth rate of 3.22% (CIA 2016). Currently, 6.2 million (16.1%) live in urban areas, and this number is growing at a rate of 5.43% annually (CIA 2015).

In 2016, Uganda had a GDP per capita of $2,100 in US dollars, and an annual GDP growth rate of 4.9% (CIA 2016). The agriculture sector contributed to 24.5% of GDP, industry 21%, and services 54.5%. The annual growth rate of industrial production was 5% (CIA 2016).

As is the case elsewhere in Africa, the Uganda Investment Authority (UIA 2016) identified SMEs as one of the key drivers for economic growth, along with economic liberalisation. African small businesses account for 80% of the continent’s employment.

The country’s poverty and nutritional status is poor, with 19.7% of the population below the poverty line (CIA 2013), and an average life expectancy at birth of 55.4 years (CIA 2016). Adult obesity is estimated at 3.9% (CIA 2014), and 14.1% of children under five years of age are underweight (CIA 2011).

2.2 Agriculture Sector Performance

In 2013, 71.9% of Uganda’s population (29.8m) worked in agriculture (CIA 2013). This, along with its natural resource endowment, makes it highly suitable for agricultural production and processing. The climate is mostly tropical; generally rainy with two dry seasons (December to February and June to August) but the North-Eastern region has a semi-arid climate. In 2011, an estimated 71% of land was used for agriculture, of which around 34% was arable, 11% was under permanent crops, and 26% was devoted to permanent pasture (CIA 2011). The most important crops by area planted, production volume and value are presented in Table 2 below.

Table 2 Area, production and value of Uganda’s most important crops in 2014

<table>
<thead>
<tr>
<th>Uganda Value Chains</th>
<th>Area Planted ('000ha or '000 head)</th>
<th>Production ('000 MT)</th>
<th>Value ('000 $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>1,105</td>
<td>2,763</td>
<td>347</td>
</tr>
<tr>
<td>Banana</td>
<td>140</td>
<td>586</td>
<td>165</td>
</tr>
<tr>
<td>Cassava</td>
<td>852</td>
<td>2,812</td>
<td>293</td>
</tr>
<tr>
<td>Dry Beans</td>
<td>674</td>
<td>n/a</td>
<td>506</td>
</tr>
<tr>
<td>Sweet potato</td>
<td>454</td>
<td>1,863</td>
<td>140</td>
</tr>
<tr>
<td>Groundnut</td>
<td>422</td>
<td>296</td>
<td>121</td>
</tr>
<tr>
<td>Coffee</td>
<td>401</td>
<td>220</td>
<td>236</td>
</tr>
<tr>
<td>Sorghum</td>
<td>373</td>
<td>299</td>
<td>41</td>
</tr>
<tr>
<td>Soybean</td>
<td>46</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Sesame</td>
<td>207</td>
<td>124</td>
<td>82</td>
</tr>
<tr>
<td>Fresh vegetables</td>
<td>140</td>
<td>856</td>
<td>161</td>
</tr>
<tr>
<td>Rice</td>
<td>95</td>
<td>237</td>
<td>63</td>
</tr>
</tbody>
</table>

Source: FAOSTAT 2014

In 2008, The Uganda Bureau of Statistics (UBOS) conducted an agricultural census (UBOS 2011) and estimated that Uganda has around 3.95m agricultural households, of which around 20% were female-headed and the sex ratio of occupants was 1.02 males:females. Around 80% of Ugandan women are employed in the agricultural sector, contributing around 75% of agricultural production (Musimami 2012). However, they control less than 20% of outputs and female producers continue to experience
challenges in accessing the factors of production, with average productivity 17% less than that of men or joint family production initiatives (MAAIF 2016).

Around 28% of these households were in the Western region, with 28% and 21% in the Eastern and Central regions, respectively. Around 30% of agricultural households engaged in off-farm productive activities such as manufacturing activities and the operation of hotels and restaurants. The average farm size in Uganda is 1.1 ha. An estimated 91.7% of agricultural households used locally produced seeds, and 31.1% used improved seeds.

Increasingly volatile weather patterns have begun to impact farmers, with prolonged droughts and unpredictable rainfall. In 2010, major flooding near Mount Elgon destroyed 60,000 coffee trees. Rising temperatures have also been causally linked to the spread of plant pests and diseases. In Eastern Uganda, coffee leaf rust, usually found at lower altitudes, is increasingly occurring at higher altitudes (Musimami 2012).

The distribution of agricultural inputs is a decentralized service that is mainly undertaken by MAAIF and the semi-autonomous agencies through local government institutions to ensure product delivery at market prices to intended beneficiaries. The MAAIF is a regulator of both importers and distributors of inputs to farmers directly through local governments, service providers such as nursery operators, agro-dealers and distributors, and cooperatives whose responsibility is to ensure timely delivery of all inputs to farmers.

Inputs are procured in compliance with the Public Procurement and Public Asset Authority (PPDA) Act of 2003, for distribution to farmers before the planting season based on the ecologies in the different agricultural sectors.

The inputs are delivered to district stores or beneficiaries by suppliers under each project. For instance with the National Agricultural Advisory Service (NAADS), the main programme through which government provides inputs, communities work with private suppliers to source inputs and the districts quality assure. Farmers at various district level are also empowered to oversee the supply and distribution of agricultural inputs for some projects, and inputs sourced under the MAAIF are distributed directly to beneficiaries by private suppliers.

Projects under PPPs, such as the Vegetable Oil Development Project (VODP) import all agricultural inputs. The seeds are raised in private nurseries and later distributed to beneficiaries. Inputs sourced under the National Agriculture Research Organization (NARO) are produced at research centres and later distributed to farmers for multiplication. Projects that source inputs under the private sector, such as the Cotton Development Organization, buy inputs from processors (in this case, ginners) and distribute them to farmers at a subsidized price.

Failure of local governments to follow established criteria for distribution has resulted in wastage and abuse of the practice, and inputs distributed are often of poor quality.

In acknowledgment of its central economic importance and cross-sectoral linkages, in 2016, the Government increased the agriculture sector budget allocation by 65% to UGX 832.42bn (Deloitte 2016). In the financial year 2016/17, the Ugandan Government outlined the following priorities for the agricultural sector, in accordance with the national budget strategy, and the National Development Plan 2:

- Implement the refined Agriculture Single Spine Extension System;
- Control of pests, vectors and diseases in both crops and animals;
- Availability of quality inputs at farm level;
• To increase water for agricultural production at farm level through direct public project support and subsidise the construction of small scale on-farm valley tanks and valley dams;
• Intensify its efforts to support value addition and primary processing of the national priority and strategic commodities;
• Intensify regulation and enforcement activities in crop, livestock and capture fisheries.

2.3 Donor Landscape

Overall Official Development Assistance (ODA) disbursements to Uganda have remained relatively unchanged, if one excludes the debt relief in 2006. By 2015, total disbursements amounted to $1.7bn which represents a 28% increase.

![Figure 1 Official Development Assistance Disbursements Uganda, 2005-2015](image)

Roughly half of funding to Uganda comes from the thirty OECD-DAC donors, who -- when averaged between 2005 and 2015 -- account for roughly 55% of funds. Using the latest CRS figures (2015) the five largest donors are: the World Bank ($619m), the United States ($596m), the Global Fund ($376m), Japan ($185m) and the United Kingdom ($136m).

Agricultural aid has remained relatively stable but grown at a much slower rate than overall aid to Uganda. Between 2005 and 2015, agricultural ODA grew by 7% -- reaching $109m in 2015. This is significantly slower than the overall growth in aid disbursements of 28%.

The role between bilateral DAC donors and multilaterals has seemingly reversed, with the bilateral donors now responsible for over 90% of agricultural aid. One reason for this is the decline in funding from the World Bank, who in 2005 disbursed $51.5m but by 2015 this had fallen to $8.2m.
The five largest agricultural donors as of 2015 were: the United States ($44m), the United Kingdom ($15m), the Netherlands ($12.5), the World Bank ($8m) and Denmark ($5.5m). There are 827 agricultural projects on the International Aid Transparency Initiative (IATI), of which 179 are active. The highest concentration of projects, and active projects, are within the sub-sectors: “agricultural development”, “agricultural policy” and “agricultural research” (Figure 3).

The World Bank has also taken a market-orientated approach, in that they are currently working with the Uganda Ministry of Agriculture to intensify on-farm production of cassava and beans. Additionally, they are investing to improve post-harvest handling, storage and the capacity of farmers’ associations to improve their capacity for marketing produce. The United States are investing more towards infrastructure projects, with particular benefit to smallholder farmers, to improve the storage facilities of beans and maize. Additionally, USAID have been working to strengthen bean and maize value-chain management, service delivery and overall institutional knowledge. Heifer International have, however, sought to invest in increasing sesame and beans productivity in the areas of Ruhiira and Keberamaindo so as to tackle food immediate insecurity.
3. Production and Consumption

3.1 Beans (Phaseolus vulgaris)

3.1.1 Production

Dry beans are becoming an increasingly important aspect of Uganda’s agricultural output. In 2014, national production was at around 880,000 MT from an estimated area of 674,000 ha (FAO data), dominated by the Western and Northern regions. It is estimated that 1.5 million smallholders produce dry beans on an average farm size of 0.45 ha. There are two annual cropping seasons, March to June and September to December (Larochelle et al. 2015). In 2010, it was estimated that around 32% of production was consumed directly by households, with 32% sold, 23.5% stored for later use, and 12.5% used for other purposes such as seed for next season planting (UBOS data). However, dry beans have since become more significant to smallholders as a cash crop.

FAO data for dry beans production in East and South Africa in 2014 is presented in the charts below.

Between 1999/2000 and 2005/06, there was a 151% expansion in average household land area allocated to bean production, whilst output only grew by 34%, as yield declined by 64% during the same period. FAO data suggests that Ugandan bean production dropped between 2005 and 2012 despite an expansion in production area of 28% (Larochelle et al. 2015). As is evident in the figures above, Uganda is a regional leader in productivity and second only to Tanzania in total output. Increased productivity can be achieved through high quality seed inputs such as Rhizobia, support for improved pest and disease control, and strengthening mechanisation and extension services (MAAIF 2016).

At the time of writing, bean producers can earn gross margins in the range of UGX 170,000–400,000 per ha per season, depending on the production technology used. Improved bean varieties can generate in excess of 30% greater profitability in comparison with local varieties (Kraybill & Kidoido 2009).
3.1.2 Consumption

On average, beans are consumed on around three days per week and are important to Ugandan household diets (Larochelle et al. 2015). Annual per capita bean consumption is around 9.8kg (Larochelle et al. 2015). Bean plant products are consumed either fresh – green leaves, green immature pods and/or fresh grains – or dry. The fresh form is consumed when the crop is immature and is particularly popular in rural areas, where consumption peaks in the months of November and June (Larochelle et al. 2015). Consumption of fresh beans also increases in urban areas during these months but to a lesser extent.

The fresh grain is preferred to the dry bean because of its fresh flavour, improved taste, and reduced cooking time. However, this preference renders it more expensive and it is thus less affordable to low-income urban households (rural households can consume their own production). In addition, fresh beans are more perishable and harvesting and primary processing can take up to three weeks. Consequently, the demand for fresh beans is much lower than for dry beans in urban areas (Larochelle et al. 2015).

In the months of February and March, fresh bean consumption is at its lowest in rural areas, with a knock on effect to urban consumption, which is at its lowest rate in March and April at an average of around 0.1 days per household per week. During these periods, only dry beans are available and traded in most parts of the country. Monthly variability in trading is not as marked for dry beans as it is for the fresh product. Between January and June, dry beans are marketed from rural to urban households, generating cash income for smallholders but reducing the amount available to them for consumption. Meanwhile, the quantity of dry beans available for urban consumption increases (Larochelle et al. 2015).

Uganda is a net exporter of beans, and trades around 20% of production (UEPB 2005). Around 28,000 MT of dried beans were exported in each of the years 2011-16. A peak of 41,141 MT was recorded in 2009. Formal annual fresh bean exports are generally less than around 4,000 MT. The main markets are Kenya, South Sudan, Democratic Republic of Congo, Tanzania, Burundi, UK and USA (Kilimo Trust 2012). Cross-border trade also includes informal and unregistered sales. At the time of writing, beans sell for around UGX 2,800-3,500/kg, but prices fluctuate seasonally and according to quality – the market prefers a clean, dry product of a single variety and free from weevil infestation.

Figure 5 Dry Beans Production by Country (tonnes/year)

Source: FAO 2014
3.1.3 Market Constraints

Key challenges identified through the stakeholder interviews and desk reviews undertaken in this study are presented in the table below.

Table 3 Market System Constraints for the Bean Value Chain

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Effects on the poor</th>
<th>Systemic issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor quality, mixed products offered to market</td>
<td>Poor consumers receive poor quality products</td>
<td>Weak extension support systems for producers; information failures</td>
</tr>
<tr>
<td></td>
<td>Prices, and therefore producer incomes are limited</td>
<td></td>
</tr>
<tr>
<td>Low adoption rates of improved seed varieties and fertiliser</td>
<td>Limited productivity and incomes for smallholder farmers</td>
<td>Weak improved seed and fertiliser markets with limited availability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weak extension support systems for producers; information failures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Underdeveloped agricultural micro-finance markets</td>
</tr>
</tbody>
</table>

3.2 Rice

3.2.1 Production

In 2014, rice production was around 237,000 MT from an estimated area of 95,000 ha (FAO data). Around 60% of production is of lowland varieties and 40% of upland varieties (JICA 2013). The Eastern region accounts for around 67% of production, followed by the Northern region at around 23%. Production, particularly of upland varieties, is greatly increasing in the North, West, and East-far regions (JICA 2013). Around 77,000-103,000 smallholders are engaged in rice production, with an average farm size of 0.4 ha. Rice is produced from February to June and August to December (Ricepedia 2014). According to UBOS (2011), around 24% of production was consumed in-household and 54% sold for cash. The figures below present FAO productivity and production data for East and South Africa in 2014.

Figure 6 Rice Yield by Country (kg/hectare)

Source: FAO (2014)
Indicative gross margins are in the range of UGX 1,250,000-2,250,000/ha/season, depending on the production technology used and the resulting productivity (Kraybill and Kidoido 2009). The use of improved seed varieties and best practices can triple profitability. The graphs in Figure 6 and 7 demonstrate that Uganda is the worst regional performer in terms of rice yields, but is the second highest producer. Productivity can be increased through the multiplication and distribution of improved foundation seed, mechanisation of rice production, efficient irrigation infrastructure and provision of extension services.

Climate change forecasts suggest that by 2050, global rice prices will increase between 32-37% and that productivity will fall by 15% in Sub-Saharan Africa (Nelson et al. 2009). Rice production is a substantial source of greenhouse gases although there are methods, such as growing rice in flooded fields that can reduce this.

### 3.2.2 Consumption

According to FAO data for 2014, an estimated 70,000MT of the 237,000MT of rice produced were exported. Estimates of exports as a proportion of national production range from 20-27%. With total rice consumption for 2014 estimated at 174,186 MT (FAO data) – and per capita consumption at around 6-8kg (MAAIF 2012) – there existed a deficit filled by imports, mainly from Kenya, Tanzania, and Rwanda (JICA 2013). Uganda’s population growth and urbanisation means that rice consumption is expected to continue to rise and the country will remain a net importer of rice in the medium term.

Kampala receives around 46% of the rice marketed, which is then distributed nationally. At the time of writing, locally produced rice sells for around UGX 3,000–3,800/kg but previously in 2017 prices reached UGX 4,000/kg. Upland rice prices have recently tended to be more stable than those of lowland varieties, although this may change according to rainfall patterns.
3.2.3 Market Constraints

Table 4 Market System Constraints for the Bean Value Chain

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Effects on the poor</th>
<th>Systemic issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low rates of improved seed and fertiliser use</td>
<td>Limited yields and incomes from rice</td>
<td>Weak input supply system with low output and availability of trustworthy improved seed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weak extension channels and information failures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Underdeveloped agricultural micro-finance markets</td>
</tr>
<tr>
<td>Widespread presence of counterfeit seed and fertiliser</td>
<td>Low productivity despite investment, limiting profitability and disincentivising input use, further limiting output</td>
<td>Weak input systems with low output and availability of trustworthy improved seed and quality assured chemical inputs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weak regulatory and enforcement frameworks/capacities</td>
</tr>
<tr>
<td>Limited investment in modern, efficient processing machinery</td>
<td>Sub-optimal conversions rates and output quality limit profitability along the value chain and, therefore, farmer incomes</td>
<td>Price-quality disconnect, with no reward for better quality outputs and, therefore, a weak business case to invest in modern machinery</td>
</tr>
<tr>
<td>Scattered production and lack of collective input purchase and output marketing</td>
<td>High transaction costs and low bargaining power limit incomes for smallholders</td>
<td>Weak horizontal coordination of producers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environment-agriculture conflicts</td>
</tr>
</tbody>
</table>

3.3 Sesame

3.3.1 Production

Sesame is a vigorously growing plant that requires little farming support and can perform well under drought conditions, in high heat, with residual moisture in the soil. In 2014, Uganda was the seventh largest producer of sesame seeds in Africa and the 12th largest in the world.2 Sesame ranks second to groundnuts in Uganda’s major oil crops and is mainly produced by small-scale farmers in the North of the country (93% of the 2008-09 production was derived from this area). The recently improved security in the region after a long period of instability has enabled the development of its agriculture.

White and brown types are grown in Uganda, with the SERRA and Sesi-1 species dominating. According to FAO statistics, sesame production peaked at around 216,000MT in 2012, but more recently has settled at around 124,000MT. Production of seed material has similarly plateaued, in this case at around 2,000MT.

2 FAOSTAT
The area planted grew exponentially from less than 200ha until 2010 to over 200,000ha in 2012, where it had remained until the last available data in 2015. Yield remains stable, and relatively low, at around 0.60MT/ha – Uganda ranked 39th in the world for productivity in the 2014 FAOSTAT dataset, behind Burkina Faso (0.63MT/ha) the Central African Republic (0.64MT/ha), Ethiopia (0.69MT/ha), Cameroon (0.74MT/ha), Nigeria (0.78MT/ha), Benin (0.78MT/ha), and Tanzania (leading African nations’ productivity at 1.23Mt/ha; Italy was by far the most productive sesame producer in the world at 17.62MT/ha). It is clear that the inertia in national sesame production over the period of available data was related to stagnation in both yield and planted area.

In the main northern Uganda production area, and also in the eastern region, where rainfall is bimodal, there are two seasons – March-April to June-July and August-September to November-December. In good years, the sesame crop is significantly larger in the second season than in the first due to a larger production area and higher yields, although quality tends to be higher from the second harvest because more time is available for drying. Farming methods employed in sesame
production are simple and have not changed over many generations. Farmers use draught animals for land preparation, plant by broadcasting and weed, harvest, dry and thresh manually. As such, sesame farming is characterized by low resource use with little mechanization or use of inorganic fertilizer and chemical pesticides.

The oil produced from the local sesame variety grown in Uganda is distinctive in that it is grown organically and has a very high oil content. Referred to locally as simsim, almost every farmer in the North Nile zone grows it in rotation with cotton.

The top exporters of sesame seeds by value were India (USD395m), Burma (USD 165m), Tanzania (USD 129m), China (USD 48.9m) and Pakistan (USD 31.6m) with a global total value of USD976m. Uganda is a net exporter of the crop – the quantities and values of imports of the seed were trivially small over the period of available data, whereas exports had grown from just over 900MT in 2003 to over 22,000MT in 2013, closely tracked by value (USD28.4m in 2013).

![Figure 10 Uganda Sesame Import Value and Volume, 2003-13](image)

Source: FAOSTAT

### 3.3.2 Consumption

Sesame seed is one of the oldest oilseed crops known, domesticated well over 3,000 years ago. It has one of the highest oil contents of any seed (typically around 50-55% edible oil and 25% protein, although Ugandan varieties may have as much as 76% oil content). There are four main end markets: home consumption, urban market grain trading, processed market sales and export grain. In Uganda, commercial uses for sesame are expanding and include use in oil extraction, confectionery and animal feeds.

It is sometimes sold with its seed coat removed (decorticated), and this variety is often present on top of baked goods (breads, buns and bagels, in crackers and in cakes) in many countries. The ground seeds are used in East African cuisine in soups and fish dishes. They are also used in sweets, including a dish similar to peanut brittle. Ground seeds are also used as a condiment in some Asian and Indian dishes.

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1 UN COMTRADE data accessed through the MIT Observatory of Economic Complexity interface
Sesame oil keeps well and resists rancidity, giving it an outstanding shelf life due to the presence of antioxidants including sesamolin and sesamol. This quality makes it applicable for use in the manufacture of margarine in many parts of the world where there is inadequate refrigeration.

Commercially, the oil comes in two types – a pale yellow liquid with a pleasant grain-like odour and somewhat nutty taste, and an amber-coloured and aromatic variant made from pressed and toasted sesame seeds. The former is high in polyunsaturated fats, ranking fourth behind safflower, soybean and corn oil. It is excellent for use as frying oil, in cosmetics and in food preparations. The latter is a popular ingredient used as a flavouring agent in the final stages of cooking in ethnic cooking (and not used as a cooking oil because the flavour is too intense and it burns quite easily). Sesame oil is also used in paints, soaps, cosmetics, perfumes, bath oils, insecticides and pharmaceuticals (vehicle for drug delivery). Poppy seed, cotton seed and rape oils are frequently added to sesame oil.

It is naturally antibacterial, antiviral and anti-inflammatory, effective against common skin pathogens as well as common skin fungi. The oil for pharmaceutical use is extracted from high-quality seed and is more refined than that intended for human consumption or other “food-grade” (cosmetic) applications. Sesamolin and sesamol maintain fats and increase vitamin E activity dramatically. They are also being researched as potential industrial antioxidants, as well as nutraceuticals and potential templates for synthetic pharmaceutical compounds.

When the seeds from food-grade, high-oil sesame are extracted, the resulting sesame meal contains 34-50% protein. This meal is often blended with other flours for baking and other food uses. The sesame meal remaining after the oil is pressed from less desirable food-grade or non-food-grade seed is an excellent high-protein feed for poultry and livestock. Both sesame meal and flour can be added to recipes to give a better nutritional balance to health food products. The antioxidants naturally found in sesame increase the shelf life of other food products produced with the flour.

Tahini, a traditional Middle Eastern sesame paste, is made from hulled sesame seed. Dip and spread manufacturers use tahini in conjunction with chickpeas to produce hummus and with egg plant to produce baba ganouj. Halva production is a subset of this industry. Halva is a popular sweet made by mixing approximately 50 percent tahini with boiled and whipped sugar and several other ingredients.
In 2016, the top importers by value were China (USD956m), Turkey (USD235m), Japan (USD205m), South Korea (USD111m) and Israel (USD67.4m), with a global total value of USD2.13bn, 81% of which was accounted for by Asia, 11% by Europe, 4.5% by North America and 3% by Africa. Sesame exports sell across a wide price range. Quality perception, particularly how the seed looks, is a major pricing factor. Most importers who supply ingredient distributors and oil processors only want to purchase scientifically treated, properly cleaned, washed, dried, colour-sorted, size-graded, and impurity-free seeds with a guaranteed minimum oil content (not less than 40%) packed according to international standards. Seeds that do not meet these quality standards are considered unfit for export and are consumed locally.

Drivers include growing awareness of food health issues, growing demand from baking, confectionary and pharmaceutical industries and the niche, but growing, organic segment. Prices are influenced by the sesame crop performance of the main importers and, therefore, their level of demand. They have risen as high as USD1,700/MT in poor global production years but in 2017 have been around the USD800-900/MT level.

The distinctive nature of the Ugandan product, with its “organic by default” production and exceptionally high (56-76%) oil content, has led to value addition attempts through branding but with limited success.

3.3.3 Market constraints

Table 5 Market System Constraints for the Sesame Value Chain

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Effects on the poor</th>
<th>Systemic issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>High production cost variation;</td>
<td>Limited productivity, profitability and incomes</td>
<td>Severely underdeveloped commercial seed market</td>
</tr>
<tr>
<td>poor farm management and record keeping; investment in poor inputs or use of recycled/adulterated seed</td>
<td></td>
<td>Weak extension and knowledge flow to producers (information failures)</td>
</tr>
<tr>
<td>Inconsistency in production and supply of quality sesame; high moisture content due to poor crop handling by producers and traders during harvest and storage lack of moisture meters, weighing scales etc.</td>
<td>Limited prices and, therefore, incomes from sesame</td>
<td>Weak horizontal coordination; lack of joint marketing activity</td>
</tr>
<tr>
<td></td>
<td>High transaction costs and low chain efficiency limiting prices offered to producers and, therefore, incomes from sesame</td>
<td>Weak technical transfer channels in best practices to traders</td>
</tr>
<tr>
<td>Limited acreage with low productivity, scattered producers and lack of collective bulking to promote single deliveries and limited storage places.</td>
<td>Limited productivity and income for smallholders</td>
<td>Weak extension and knowledge flow to producers (information failures)</td>
</tr>
<tr>
<td>Low adoption of improved sesame varieties</td>
<td>Limited market prices and, therefore, incomes for chain</td>
<td>Weak improved seed market and lack of smallholder multiplication</td>
</tr>
<tr>
<td>Low output of organic sesame</td>
<td></td>
<td>Weak extension and knowledge flow to producers (information failures)</td>
</tr>
</tbody>
</table>

4 UN COMTRADE data accessed through the MIT Observatory of Economic Complexity interface
actors failures)
Conflict between malaria control programmes and organic farming requirements
4. Development Characteristics

4.1 Gender

According to the UNDP Uganda Country Gender assessment 2015 the main issues are:

- **Law vs. practice.** There is a disconnect between Uganda's very positive legal framework and the lack of effective implementation or enforcement of gender-positive laws. This means that women's legal status is precarious, their capacity as economic agents is limited, and their rights are not effectively guaranteed.

- **Rapid population growth.** Uganda's population is growing at a rapid rate, with high total fertility, high dependency ratios, and a significant "youth bulge." This means that the country's demographic dynamics will affect the ability of the country to meet the ambitious goals of becoming a middle income country set out in its Vision 2040 statement.

- **Socio-cultural norms and patriarchal attitudes.** Attitudes, beliefs and practices that serve to exclude women are still deeply entrenched throughout the country. This means that unbalanced power relations between men and women continue to have a negative impact on women's agency, their human capital development, and their ability to contribute equitably to Uganda's growth and prosperity.

- **Persistence of sexual and gender-based violence.** The country suffers from a persistent high level of sexual and gender-based violence. This means that Ugandan society pays a high price in lost work days and lost economic capacity, over and above the severe detrimental effects on families and the society at large.

- **The "overburden" of women persists.** Women's active role in the economy is coupled with the disproportionate burden they bear of unpaid "care" work in the household, including child and elder care, and provisioning of food, fuel, and water. This means that women are more labour constrained than men and face trade-offs among competing uses of time.

More specifically, all three crops are currently characterised by large female labour inputs and, when grown at subsistence level, women also handle harvesting and processing functions.

4.1.1 Beans

Common beans (*Phaseolus vulgaris*) have historically been considered a women's crop in Uganda, partly due to their close identification with subsistence cropping and women's role in household provisioning. However, women and men participate in all bean production activities, with women predominating in planting, weeding and post-harvest processing (threshing, winnowing, sorting etc.), and men predominating in site selection, spraying against pests and diseases, bush clearing, and fertilizer application. No task is specifically a woman’s, or a man’s, for instance women also participate strongly in clearing and preparing land. Participation rates vary by household as well with factors like age, distance to bean plots, farming as a primary occupation, economic status, crop attributes, and the number of times beans are consumed in the household. Beans are usually intercropped. This is important in ensuring diversified diets, benefiting from nitrogen fixation, and contributing to climate change adaptation.

Women typically sell in local markets. These markets are close to home, they can manage to transport small volumes, capital requirements are low, and they sell direct to the final consumer. Men's participation in marketing is increasing, particularly in bulking and trading large volumes. Women are scarcely present at this level.

Marketability traits, particularly colour, are important to both women and men. Early maturing varieties are also important, particularly to women, due to their household provisioning role and the
importance of beans in the diet (beans are rich in complex carbohydrates, protein, iron, and zinc). Fresh beans (green leaves, immature pods) are preferred in rural households but can only be consumed for a couple of months. Due to perishability beans destined for sale are dried and sold to urban markets. This reduces the amount of beans available for household consumption between January and June as insufficient quantities are set aside. Early maturing varieties would extend the growing season (two crops are possible in one rainy season) and reduce the hungry season. Interventions must ensure sufficient beans are set aside for family use, as well.

There is some evidence that women continue to believe beans are a women's crop, although women and men participate across production and post-harvest processing. Another definition of a women's crop would be that women dominate sales. This is no longer the case. Women and men together participate in decision-making around the crop production cycle and marketing, but women have lower decision-making power than men over monies made. Ensuring women are fully included in value chain development is essential.

Figure 12 Women's involvement in Uganda Bean Value Chain

4.1.2 Rice

Women and youth (aged 15 to 35) and also boys and girls participate alongside men in all production activities, with actual percentages varying by task according to perceived difficulty and labour intensity (with men and male youth taking on these tasks). Only one task - harvesting rice in swampy land - is fully performed by men. This is because it is necessary to roll clothes above the knee so most men wear shorts or roll up their trousers. For women to roll up their dresses so high is considered indecent. This means that female-headed households (FHH) face particular constraints since they have to hire men (if they do not have access to adult male youth or other male family labour) for this task, and for other particularly labour-intensive work. Timeliness can be particularly difficult for FHH: late harvesting contributes to significant post-harvest losses. It is estimated that losses are around 60% with late harvesting whereas losses during timely harvesting are only 3%.

These issues do not constrain upland rice where the introduction of improved upland rice varieties has contributed to strongly expanded rice production in Uganda – reducing imports by a third. However, one study shows strong increases in labour demands due to increased weeding and bird scaring - the latter is particularly a child's job. This negatively affects women's and children's time for other activities, and leads to increases in labour expenditure.

Men dominate post-harvest activities in the rice value chain because they are capital intensive and women lack investment capital. All rice seed multipliers, 98% of rice millers, 96% of rice traders (and 87% of agro-input dealers) are men. Women are involved in preparing food for mill workers, cleaning
mill premises, and sorting and winnowing the milled rice. Women sell rice in local and roadside markets, particularly in Amuru in Northern Uganda, an important producer of upland rice.

Men’s strong participation in harvesting, and particularly milling and selling rice, means that youth and women tend to receive minimal financial benefits from sales (dependent on intra-household bargaining processes).

There are no cultural barriers to women participating in rice production. Promoting women’s access, and organising them into producer and marketing cooperatives will enable them to benefit from rice markets.

**Figure 13 Women’s involvement in Uganda Rice Value Chain**

4.1.3 Sesame

Historically, in Uganda, sesame was regarded as a woman’s crop. It was grown on marginal lands or in kitchen gardens, and grown for consumption at a local level. When commercialised sesame began to take off in Uganda, sesame became considered a cash crop. It’s frequently noted in the literature that cash crops and export crops are male crops, while subsistence crops are female crops. Typically, evidence suggests, men may take over production and marketing, even of traditional women’s crops, when it becomes financially lucrative to do so.

Additionally, the shift to commercialised sesame at a small holder level has meant that workload for women has considerably increased. Sesame is a more labour intensive crop, from planting to weeding, and especially post-harvest processing. One study looked at the gender dynamics of commercialisation of sesame in another Sub-Saharan country, Malawi. The shift to commercial sesame production resulted in a significant increase of labour for women primarily due to the impact

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of higher yields on labour intensive post-harvest work. Also, hired labour, when used, was almost exclusively utilized for pre-harvest work, which did not alleviate the post-harvest labour burden for women. In Uganda, it is estimated that women do 85% of the planting, 85% of the weeding, 55% of land preparation and 98% of all food processing. When production of sesame is increased, especially at a small holder level, it is estimated that women's workloads considerably exceed those of men.

However, as production becomes more commercially focussed male appropriation may occur. The case of sesame in Malawi is instructive. Commercial sesame is considered a ‘man’s crop’ or a ‘family crop’ but when it was regarded as a food crop it was mostly intercropped with cotton and indeed perceived as a woman’s crop, with women mainly responsible for its production and processing. When sesame became a cash crop many farm households allocated parts of their cotton field – a crop mostly considered the domain of men – to sesame. The combination of a shift of usage of sesame from food crop to mostly cash crop, coupled with the fact that most land for commercial sesame production had previously been under the control of men, resulted in the shift of perception – a significant increase of interest of men in the crop, resulting in increased oversight and control of men over production. The division of labour remained the same; pre-harvest work is jointly done by the husband and wife, and post-harvest work is exclusively carried out by women. Commercialisation of sesame led to a significantly increased workload for women due to the impact of higher yields on labour intensive post-harvest work. Control over allocation of income remained the same; final decision making power rests mostly with men. In cases of contract sesame farming, the signatory has much greater access to information and knowledge on markets, inputs, prices, etc.

4.2 Nutrition

Ugandans primarily consume plantains, starchy roots (cassava and sweet potatoes) and cereals such as maize, millet, and sorghum, with some regional variation. Their diet also includes nuts and green leafy vegetables. Rice is one of the most important food staples in the central and western regions of Uganda. Almost 70% of Uganda’s population is poor, with 38.2% in living “severe poverty.” The 2016 Global Hunger Index scores Uganda at 26.4, which is considered “serious.” Key factors contributing to that score include:

- 25.5% of the population is considered undernourished;
- 4.3% prevalence of wasting of children under 5 years;
- 34.2% prevalence of stunting among children under 5 years; and
- 5.5% mortality rate for children under 5 years.

There is a high incidence of infectious diseases, compounded by very limited access to improved sanitation, low immunization rates, and limited access to essential health care. All of these factors contribute to a high rate of child mortality.

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The Ugandan diet is mainly composed of plantain, starchy roots (cassava, sweet potatoes) and cereals (maize, millet, sorghum). Pulses, nuts and green leafy vegetables complement the diet. In urban areas, which are undergoing a nutrition transition, food consumption patterns are changing and rice is gaining importance. Overall, the diet remains poor in micronutrient-rich foods. Food insecurity persists in some parts of the country, mainly due to poverty, adverse climatic conditions, low agricultural productivity and prolonged civil insecurity in some regions.

4.2.1 Beans

Beans provide 25% of the total dietary calorie intake of Ugandans and 45% of their protein intake. Beans also are a major source of complex carbohydrates, essential micronutrients, dietary fibre, vitamin B and antioxidants.\textsuperscript{14} Despite these nutritional benefits, less than 15% of smallholders farmland is under bean cultivation.\textsuperscript{15}

The potential nutritional benefits are not being realized due to inadequate pre- and post-harvest handling techniques. Late harvest can expose beans to fungus, damage and breakage during threshing and there is a high incidence of insects infestation where farms store beans in their homes. Also, beans require a lot of fuel for cooking.\textsuperscript{16}

4.2.2 Rice

Although rice alone does not supply all of the nutrients necessary for adequate nutrition, rice is a significant source of dietary energy as well as a good source of thiamine, riboflavin and niacin.\textsuperscript{17} Different rice varieties provide different nutritional value: black and brown rice providing the most protein.\textsuperscript{18} Red rice contains the most iron. In addition, unmilled rice contains a significant amount of dietary fibre.\textsuperscript{19}

4.2.3 Sesame

Sesame seeds are a known source of fats (oil), protein, iron, zinc, and many other nutrients, and sesame has been linked to benefits such as lowering cholesterol, reducing blood pressure, blood sugar reduction, and antioxidants.\textsuperscript{20} Particularly in Northern Uganda, sesame is consumed traditionally through a sesame paste, which can be added to greens or beans. Local extraction of sesame oil in Uganda is mainly done traditionally using a mortar and pestle. The remaining seed cake that is left behind from this process is normally used to prepare meals cooked with either smoked fish or vegetables and in some cases used as animal feed.\textsuperscript{21} Despite all of this, unfortunately there is little research available on whether the production of sesame as a cash crop has any effect on household nutrition levels.

\textsuperscript{14} Kilimo Trust (2012) Development of Inclusive Markets in Agriculture and Trade (DIMAT): The Nature and Markets of Bean Value Chains in Uganda, UNDP.
\textsuperscript{15} Mazur (2013) Integrating Nutrition in Value Chains and Smallholder Farming and Marketing Systems: Case Study from Uganda, Iowa State University.
\textsuperscript{16} Hawkes & Ruel (2011) Value Chains for Nutrition, FAO.
\textsuperscript{17} FAO (2010) Rice and Human Nutrition, FAO.
\textsuperscript{18} FAO (2010) Rice and Human Nutrition, FAO.
\textsuperscript{19} FAO (2010) Rice and Human Nutrition, FAO.
\textsuperscript{20} Berkeley Wellness (2016) Sesame: Little Seeds, Big Benefits.
\textsuperscript{21} FIT Insights Agritrade Linkages + Knowledge (2017) Sesame oil production continues to waver
Sesame seeds have been marketed historically, by Catholic Relief Services and other NGOs, as an additional source of protein. The FAO has published recommendations on the addition of sesame paste to ugali as a way to increase the nutrition of the staple food of Uganda. However, it remains to be seen that as farmers commercialise their sesame production if that translates to increased household consumption of sesame.

4.3 Climate Change

A warming trend is projected to continue in Uganda, with some projections suggesting an increase of up to 1.5°C as early as 2030. Similarly, temperatures could rise between 0.9°C and 3.3°C by the 2060s. Predicting regional rainfall changes in the tropics is a major challenge for climate scientists, and projections are more uncertain. On average, the forecasts for Uganda show a slight increase in mean rainfall. Most of this increase is projected for the western shores of Lake Victoria and the Mount Elgon region in the central west, and for the zone extending from Mount Rwenzori to the southern parts of Lake Kigoa. According to Future Climate for Africa (November 2016) there could be a reduction in the national production of food crops such as cassava, maize, millet and groundnuts by 2050. Overall losses of food crops by that time could reach US$1.5 billion, with major export crops like coffee and tea experiencing a reduction in yields leading to combined economic losses of an additional US$1.4 billion. Fishing provides a source of livelihood for up to 1.2 million people, and employs about 8% of the total labour force. Climate change is likely to stress fisheries, resulting in disrupted livelihoods and significant economic losses.

4.3.1 Beans

The International Food Policy Research Institute (IFPRI) modelled impacts of long-term rainfall and temperature trends on bean yields, which indicated a 20% reduction. Recommended adaptation strategies include:

- Improving water availability;
- Crop diversification;
- Pasture for animals and support to livestock holdings.

Another recommendation is an early warning system to inform the sub-sector of adverse weather conditions likely to affect bean productivity.

4.3.2 Rice

Climate change is expected to have a negative overall effect on rice yields, with East Africa losing as much as 16% of its current production by the end of the 21st century. Within that estimate, studies differ. Optimum growing temperature for rice is 25°C. A rise in temperature will likely cause an increase in yields, although at a 1°C increase in temperature above normal, there will be a 10% decrease in rice yields. Another study found a 1°C increase causing a 0.6% decrease in yields. That

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being said, rice appears to be one of the more climate resilient food crops, particularly as compared to maize or wheat.26

4.3.3 Sesame

The vast majority of sesame production, 93.7%, is found in northern Uganda.27 The reason for the heavy prevalence of sesame in the north is due to the fact that Northern Uganda has hotter temperatures and less rainfall, more suited to sesame production. Sesame is a crop that is generally quick to mature, prefers warm soils and is considered drought tolerant.28 Northern Uganda is also known as the region of Uganda most susceptible to the effects of climate change.

Sesame is a more suitable crop for areas that face drought or high temperatures. The optimum range or growth, blossoms, and fruit ripeness is 26-30°C. Due to its tap root system, the plant is highly resistant to drought and thrives in moderate rainfall of 300-600 mm, optimally spread throughout the vegetation period.29 The current USGS Climate Trend Analysis of Uganda demonstrates expectations that rainfall will decrease across both the short and long periods of rain, and warm regions will expand, especially in the North.30 The ideal range for sesame may increase due to these trends.

Also to consider, sesame does have its setbacks that make it a challenging crop for areas affected by climate change. Pollination and the formation of capsules is inhibited during heat-wave periods above 40°C. In regions visited by strong, hot winds, the plants only form smaller seeds with a lower oil content. During each of its development stages, the plant is highly susceptible to water-logging, which presents an issue if floods were to occur. Additionally, since sesame does not compete well with other plants, plots need to be weeded and any intercropping or co-planting techniques should be avoided. Because of this, sesame plots are often particularly susceptible to erosion.31

Despite its high value and potential, sesame has received less development attention with its production characterized by low yields and low productivity. It has been proposed that this is a result of the use of traditional varieties and management practices, poor pests and diseases control practices, declining soil fertility, pre and post-harvest losses, as well as the impact of frequent extreme weather events (droughts, unpredictable seasons, or too much rainfall).

There is current research being done by the Africa Innovations Institute (AFRII)32 looking at stabilising sesame yields and production in the Lango region, Northern Uganda. This study estimates that about 80% of the population in this region depend on sesame for food and income security. Despite its importance, yields and production of sesame in this region are low and unstable, causing frequent food shortages in the region. As a part of this study, drought tolerant sesame varieties and innovations in gall midge and webworm control have been evaluated.

27 Africa Innovations Institute (2017) Crop scientists initiate climate smart innovations to improve simsim (sesame)
5. Market Linkages

5.1 Spatial and Institutional Commodity Flows

5.1.1 Beans

As with most domestic trade, Kampala is the main consumption and transit market. There are major flows of beans from production areas to Busia (for their export to Kenya and South Sudan) and to Gulu and Lira, from where they are further directed to Kampala and the Karamoja sub-region (FEWS NET 2015).

The main export destinations are Kenya, South Sudan, DRC, Tanzania, Burundi, the United Kingdom, and the United States. In 2014, beans were the third greatest export product in informal cross-border trade after maize and fish. In the 2010–2013 period, beans accounted for about 12% of informal agricultural exports (UBOS 2014b). The value of this trade was estimated at US$24.2M in the 2014 Informal Cross Border Trade (ICBT) survey (jointly conducted by Bank of Uganda (BOU) and UBOS).

Canned beans, fresh beans, and specific varieties not widely produced in the country are the main products imported. Formal imports come from Rwanda, Egypt, Tanzania, Kenya, and the United Arab Emirates (Kilimo Trust 2012). Depending on the season, there is a reverse flow of beans between Uganda and its neighbours. For instance, in the first season beans flow from eastern DRC into Uganda, and in the second season from Rwanda. In addition, reverse flows are observed for certain bean varieties that are highly favoured within the region (FEWS Network 2015).


33 Beans have since been overtaken by rice – see section 5.1.2. below
5.1.2 Rice

Most significant rice traders are based in Kampala, where there are processing and marketing facilities including warehouses, processing mills, supermarkets, transport facilities, in addition to a ready market of income secure consumers. From Kampala, rice is transported to different district towns and also exported to countries like South Sudan, Congo and Rwanda (see figure opposite).

Informal trade in rice continues to rise, as noted by the Market Analysis Sub-group of the Food Security and Nutrition Working Group (FSNWG), which monitors cross-border trade in order to quantify its impact on regional food supplies. In late 2016, rice displaced dry beans as the second most important informally traded good by volume, accounted for an estimated 19% of the total commodity trade in the region. This was attributed to increased rice supplies from the previous above average harvest in Tanzania, high demand for maize during the 2016 Christmas period, and relatively high maize prices resulting in some substitution. Data for this period are presented in the table below.

Table 6: Volumes of Rice Regional Rice Flows (MT)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Trade Flow Corridors (Source destination)</th>
<th>Trade Volumes in MT</th>
<th>% Change</th>
<th>Historical Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Last Quarter</td>
<td>Last Year</td>
</tr>
<tr>
<td>Rice</td>
<td>Uganda – South Sudan</td>
<td>6,662</td>
<td>-26%</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Tanzania – Uganda</td>
<td>8,829</td>
<td>32%</td>
<td>-419%</td>
</tr>
<tr>
<td></td>
<td>Tanzania – Kenya</td>
<td>25,000</td>
<td>-5%</td>
<td>-5%</td>
</tr>
<tr>
<td></td>
<td>Tanzania – Rwanda</td>
<td>13,473</td>
<td>65%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Somalia – Kenya</td>
<td>3,174</td>
<td>9%</td>
<td>199%</td>
</tr>
<tr>
<td></td>
<td>Somalia – Ethiopia</td>
<td>5,983</td>
<td>-41%</td>
<td>-34%</td>
</tr>
<tr>
<td></td>
<td>Tanzania – Burundi</td>
<td>759</td>
<td>292%</td>
<td>-47%</td>
</tr>
</tbody>
</table>

Source: Rice trade data from East Africa Cross Border Trade Bulletin, January 2017
5.1.3 Sesame

The figures overleaf outline the main product flows for Ugandan sesame. The bulk of seeds are sold to rural assemblers and wholesalers, with around 42% of marketed production finding its way to international exporters in Kampala, 25% sold and consumed in rural areas, and the remainder sold in urban and regional export markets.
5.2 Stakeholder Analysis

5.2.1 Beans

A schematic representation of bean market channels appears below. Individual producers usually sell the produce at the farm gate to local, small-scale traders, who aggregate supplies and sell to medium- and large-scale traders and to market vendors. Medium- and large-scale traders also purchase beans from other traders, wholesale markets and farmer groups. These traders sell to institutional buyers, (formal and informal) exporters, hotels, restaurants and retailers (Kilimo Trust 2012).

![Bean Marketing in Uganda](image)

Producer associations and groups support their members by promoting collective production, facilitating training and, in some cases, engaging in seed production (Kilimo Trust 2012).

Beans and rice trading companies include Maganjo Grain Millers, Agrinet, Aponye, UNGA 2000 and Agroways. These could trade over 20,000 MT each. There are also numerous other smaller companies trading about 1,000 MT per annum.

In excess of 30 exporters participate in formal trade, although most trade is controlled by a small number of enterprises (Kilimo Trust 2012). The UN World Food Programme is the largest single exporter of Ugandan beans, which are directed to Rwanda, Burundi, DRC, Kenya and South Sudan (Chemonics 2010). Informal trade is undertaken by large number of both domestic and foreign traders who typically transport small volumes of produce across borders by foot or bicycle (Chemonics 2010).

According to CIAT, 45% of cross-border bean traders are women. However, men dominate transportation (70%) while women dominate retail activities (65%). More than 100 bean varieties are traded in the region, but only 10 types account for 97% of the regional trade (Birachi/PABRA 2016).

Bean sector input suppliers include agro-input dealers, most of whom are members of UNADA, Government programmes (NAADS), NGOs, producer organisations and large-scale bean buyers. The latter, along with seed companies, supply producers with seed materials, mainly on credit, in a strategy designed to manage the quality and quantity of outputs for retail or multiplication, respectively.
Actors such as financial service providers, extension agents, research and development providers, and market information providers supply ancillary services to the core value chain.

5.2.2 Rice

The flow of rice marketing is depicted in the diagram below. Farmers tend to favour rice milling before sales because the processed product gains substantial value. However this is not always practicable because some production areas do not have access to a milling machine that can process large output quantities. Local traders travel to often remote areas to collect the product from on-farm stores. It is then aggregated and transported to millers, which are usually located in marketing centres such as Lira and Gulu but can also be found in a few trading centres such as Pabbo. Medium-scale millers may provide producers with “embedded” services such as information and/or training on farming practices and post-harvest handling, credit (often at high interest rates or in return for poor output prices) and transportation of outputs to the mill.

Figure 19 Rice Marketing in Uganda

Source: Development of Inclusive Markets in Agriculture and Trade (DIMAT) UNDP 2016
The typical milling fee at the time of writing is Ush 150/kg of paddy rice, with a typical average transformation ratio of paddy:milled rice of around 65-70%. However, process efficiency of up to 85% may be achieved with the most modern machinery. With domestic markets readily accepting all qualities of rice and capital constraints of millers, there is little incentive to invest in plant upgrading, even though efficiency gains would produce better returns.

Milled rice is sold either to local wholesalers and retailers operating in rural markets and trading centres, and then on to regional importers from South Sudan and Kenya or to wholesalers and, ultimately, retailers in urban centres such as Gulu, Lira, and Kampala.

Beans and rice trading companies include Maganjo Grain Millers, Agrinet, Aponye, UNGA 2000 and Agroways. These could trade over 20,000 MT each. There are also numerous other smaller companies trading about 1,000 MT per annum.

Rice seed multipliers are key to the success of the sector in Uganda because improved planting materials drive productivity gains. Counterfeit seeds and fertilisers are an increasing problem in the sector. In addition, a lack of demand by an unsensitised smallholder population poorly served by extension agents means that major expansion of rice seed production is not perceived as an attractive area for investment.

According to the Uganda Economic Policy Research Centre (2016), only around 48% of agro-input dealers are registered, mostly with UNADA and the District Local Governments. Therefore, the remaining 52% operate illegally outside of regulation and quality control by MAAIF. Therefore, there is urgent need for Government (MAAIF) to strengthen the regulatory system, partly through operationalisation of the Fertiliser Control Regulations (2012).

5.2.3 Sesame

5.2.3.1 Farmers

Sesame is predominantly produced by smallholder farmers using simple methods that have not changed over many generations. Farmers use animal draught for land preparation, broadcasting for planting, and weeding, harvesting, drying and threshing is performed manually. As such, sesame farming is characterized by low resource use with little mechanization or use of inorganic fertilizer and chemical pesticides.

5.2.3.2 Traders

Due to the fragmented and small-scale nature of production, considerable effort is required to assemble sesame into economically viable volumes for trade. Sesame marketing is therefore characterized by numerous transactions involving small volumes, and many traders with variable capacity. These traders can be categorized based on their location, the volumes they handle and their position in the hierarchy of the sesame marketing value chain.

5.2.3.3 Rural assemblers

Include traders on foot, bicycle traders, rural open-air market traders, rural wholesalers and rural shopkeepers. Bicycle traders and traders on foot move among farms during the marketing season to buy from farmers. These traders are mostly active on non-market days and sell the accumulated stocks to rural open-air traders, who operate mainly on designated market days. They move among markets in addition to buying directly from farmers and other smaller traders. Their activities are seasonal, operating for a short period after sesame is harvested when volumes are high. During the off-season they move to other commodities.

5.2.3.4 Rural wholesale and retail traders
Stationary traders operating from permanent premises such as shops and grain stores. They buy sesame continuously throughout the marketing season from farmers, foot traders, bicycle traders and open-air traders. The bulked sesame is then transported to larger market centres at sub-county, county, district and regional levels and sold to urban wholesale produce dealers.

5.2.3.5 Regional urban wholesale traders

Found at regional market centres such as Lira and Gulu. They are commodity traders with well-established businesses and the capacity to handle large volumes, also handling other grains produced in the area. They are well capitalized and have investments in storage, and sometimes transport, facilities in addition to adequate access to formal credit. They buy sesame mainly from rural wholesalers and sell to processors and/or exporters in the regional buying centres or transport bulked sesame to exporters based in Kampala.

5.2.3.6 Processors and/or Exporters

Most are found in Kampala, the capital city of Uganda but some have buying and processing facilities in the production regions, mainly West Nile, Gulu and Lira. In Kampala, exporters screen, clean and package and ship the seed.

5.3 Key businesses in the beans, rice and sesame sub-sectors

The study identified a number of trading and processing SMEs in the value chains which are outlined in Table 7.

Table 7: Trading and processing companies

<table>
<thead>
<tr>
<th>Business</th>
<th>Sector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3R</td>
<td>Rice</td>
<td>Millers and importers of mainly imported rice. Located in Jinja.</td>
</tr>
<tr>
<td>Agroven</td>
<td>Rice</td>
<td>Millers and importers of mainly imported rice. Located in Jinja.</td>
</tr>
<tr>
<td>Divine Masters Ltd.</td>
<td>Rice</td>
<td>DML operates on 5,200 acres of farmland in Tororo and Butaleja. Works with 6,500 farmers groups representing more than 48,000 farmers. In order to maintain supply, DML works closely with farmers, providing them with agricultural and business training in addition to credit for seeds, agricultural inputs and cash. Plans to modernize its operations with the implementation of mechanized farming technologies, storage, and processing facilities.</td>
</tr>
<tr>
<td>Eastern Rice Company Ltd.</td>
<td>Rice</td>
<td>An integrated miller sourcing rice from 1,200 smallholders in 75 farmer groups scattered across 10 sub-counties in Tororo region. Aims to increase this to 150 groups. Capacity is 60MT/day. Has provided training to smallholders in business skills, procured land for smallholder production, created demonstration plots and facilitated farmer access to extension support, inputs and processing and storage facilities. Has a US$1.5bn grant from the Agricultural Business Initiative Trust (aBi; also see Government and Donor Investment) for the Eastern Rice Project.</td>
</tr>
<tr>
<td>FOL Logistics (Kingdom Rice)</td>
<td>Rice</td>
<td>A US$40m production and milling company financed by Uganda Development Bank (UDB) with headquarters at</td>
</tr>
</tbody>
</table>
Namanve Industrial Park, Kampala. Has acquired 14,000 acres of land in Nwoya District, northern Uganda, with 1,000 acres under pilot cultivation, supplemented by 17,000 outgrowers. Although it produces the Kingdom Rice brand it is still importing brown rice from Pakistan to satisfy its milling demands. Employs 600 people in Nwoya and 400 at its Namanve rice milling plant.

Pe Yero  
Rice  
Began in 2004 as a cereal farming operation in Gulu and later built a modern rice mill with capacity of 60MT/day with a loan from the Chinese Government. Buys rice from subsistence farmers in Amuru District, northern Uganda, for milling and sale. Has a warehouse on site with a storage capacity of over 100MT and rents other outlets in Gulu.

Pearl  
Rice  
Works with outgrowers in Iganga, Bugiri and Namutumba Districts using Naigombwa wetland area of 9,000 ha. Deals with organic rice production, milling, storage, importation and retail business. Also imports brown rice to satisfy its 60 MT/day mill capacity. Under the $34 m Islamic Development Bank (IDB) Rice Project, a Public-Private Partnership involving Government of Uganda, smallholder farmers and traders organized as Busowa Traders and Farmers Cooperative Union, two dams and farmland are to be created in the wetland.

Pioneer Foods (U) Ltd. (Spekko Rice)  
Rice  
Millers and importers of mainly imported rice. Located in Jinja.

Royal Rice  
Rice  
Millers and importers of mainly imported rice. Located in Kampala.

Sunad  
Rice  
Millers and importers of mainly imported rice. Located in Kampala.

SWT Tanners Ltd.  
Rice  
Growers, traders and importers of rice. Located in Ntinda, Kampala.

Tilda (U) Ltd.  
Rice  
Large multinational producing its own rice (20-25kMT/annum) and has a modern mill with an annual capacity of 40kMT. Wholly owned subsidiary of Tilda Limited, based in the UK with offices in Dubai and Delhi.

WindWood Millers Ltd.  
Rice  
Located in Lira, northern Uganda.

Agroways Ltd.  
Rice, beans  
Although licensed to handle beans, volume is insufficient to be of commercial interest. Its main business is in maize but it also trades rice. Sells to the UN WFP, local millers, institutions and exporters.

Upland Rice Millers Ltd.  
Rice, beans  
Partner in Agro-Processing and Marketing Strategy in Uganda (ASM) project (see also Government and Donor Investment below), working with 6 farmer groups that supply rice under and MoU. As part of the support package, URM has received a US$300k modern milling machine and will pay 50% of the cost over 7 years. Sells beans to the UN WFP, which it cleans and dries. Performs a linkage function between producers and buyers of processed outputs and trains farmers in post-harvest handling.

Gulu Agricultural Development Company  
Sesame  
Also works in chilies, sunflower, maize and cotton. Has a supplier base of around 80,000 smallholders in around 550
farmer groups in Gulu and Kitgum, and is expanding to West Nile. Provides inputs and training to producers and processes their outputs for export (sesame) and domestic markets. Holds organic and Fairtrade certificates. Works with aBi on an initiative to improve quality and productivity in sesame.

**Lira Resort**  
**Sesame**  
Buys selected varieties of conventional sesame using an extensive network of agents in northern Uganda and sells to exporters. States that it has plans to work with a large number of smallholders but currently works on the basis of spot market transactions.

**Olam**  
**Sesame**  
Multinational exporter of all sesame varieties, which are sorted and processed in Kampala.

**Shares!**  
**Sesame**  
Used to finance, process and export organic sesame with a smallholder production system, using a “natural fumigation” process developed in the Netherlands to achieve 99% and 99.9% purity seeds to EC/NOP and Biosuisse certified standards. However, chemical spraying for malarial control has stalled organic farming activities.

**Export Trading Group (ETG)**  
**Sesame, beans**  
Multinational agri-commodities supplier to international aid organizations (WFP, ICRC and CFGB), millers and the export market, based in Kampala. General wholesaler, importer and exporter.

**AgriExim – (Dubai)**  
**Sesame, beans (organic)**  
Based in Dubai with distribution centres in the US and EU. Export organic commodities to international standards using ECO2 treatment, steam sterilisation and HACCP management systems.

### 5.4 Financial Performance Along the Marketing Chain

#### 5.4.1 Beans

According to the estimates in a UNDP (2014) analysis presented in detail in the table below, the total gross value added to beans was around UGX 649/kg. The majority of this (54%) is added by producers, 35% by retailers, 8% by village collectors, and 4% by wholesalers. Shortening the value chain has the potential for delivering more value back to producers, although those dependent upon (sometimes exploitative) embedded services provided by intermediaries would need to find alternative sources of inputs, technical support and credit, for example.

<table>
<thead>
<tr>
<th></th>
<th>Producers</th>
<th>Village Collectors</th>
<th>Wholesalers (GVA/Bag)*</th>
<th>Retailers (GVA/Bag)*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REVENUES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield (kg/acre)</td>
<td>400</td>
<td>Selling Price/kg – 1,200</td>
<td>Selling Price – 152,000***</td>
<td>Selling Price – 185,600</td>
</tr>
<tr>
<td>Total Revenue/acre – 480,000</td>
<td>Total Revenue – 152,000</td>
<td>Total Revenue – 185,600</td>
<td>Total Revenue – 216,000</td>
<td></td>
</tr>
<tr>
<td><strong>COST</strong></td>
<td>1st Ploughing – 87,500</td>
<td>Buying Price – 144,000</td>
<td>Buying Price – 168,000</td>
<td>Buying price – 185,000</td>
</tr>
<tr>
<td></td>
<td>2nd Ploughing – 85,000</td>
<td>Packaging – 1,500</td>
<td>Drying – 500</td>
<td>Sorting – 2,500</td>
</tr>
<tr>
<td></td>
<td>Seeds – 35,000</td>
<td>Transport** - 1,000</td>
<td>Sieving &amp; Sorting – 3,000</td>
<td>Transport – 8,400</td>
</tr>
<tr>
<td></td>
<td>Planting – 40,000</td>
<td></td>
<td>Packaging – 1,500</td>
<td>Loading &amp; offloading – 1,000</td>
</tr>
<tr>
<td></td>
<td>Weeding – 43,500</td>
<td></td>
<td>Transport - 8,400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Harvesting – 20,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Winnowing – 5,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drying – 5,000
Transporting – 2,500
Packaging – 7,500

<table>
<thead>
<tr>
<th></th>
<th>Total Cost – 341,000</th>
<th>Total Cost – 146,500</th>
<th>Total Cost – 182,400</th>
<th>Total Cost – 189,100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GROSS MARGINS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acre/Season – 139,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kg/Season – 348</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per bag – 6,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Kg – 50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per bag – 3,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Kg – 27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Bag – 26,900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Kg - 224</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Value Chain analysis of the dry bean sub sector UNDP 2014

5.4.2 Rice

A detailed analysis (UNDP 2013) of value addition along the rice chain appears in the table above. Seed purchase accounted for 40% of production costs, with land preparation adding 24%. Producers’ gross margins were estimated at UGX 450,000-UGX 800,000/season. The very wide variation in these estimates is accounted for mainly by differences in productivity. For example, improved seeds (grown correctly) can almost double conventional yields, optimal use of fertiliser can add 30-40% to output volumes, and upland varieties tend to yield more than lowland strains. In addition, rice is a labour intensive crop, particularly in the weeding phase. Households struggle to optimally farm more than 0.5 acres using their own labour only; expansion is contingent upon access to sufficient capital to hire additional labour, which is problematic for most smallholders.

Table 9: Gross margin analysis: Bean Value Chain

<table>
<thead>
<tr>
<th></th>
<th>Producers CM (UCX/Acre)</th>
<th>Paddy Traders CM (UCX/Kg)</th>
<th>Millers CM (UCX/Kg)</th>
<th>Wholesalers CM (UCX/Kg)</th>
<th>Retailers CM (UCX/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>Kg/acre = 1,000-1,500</td>
<td>Selling Price/Kg = 700</td>
<td>Selling Price/Kg = 1,500-1,700</td>
<td>Selling Price/100Kg = 80,000</td>
<td>Selling Price/100Kg = 110,000</td>
</tr>
<tr>
<td>Total Revenue/Acre</td>
<td>700,000-1,050,000</td>
<td>Total Revenue/Kg = 1,500-1,700</td>
<td>Total Revenue = 96,000-105,000</td>
<td>Total Revenue/100Kg = 80,000</td>
<td>Total Revenue/100Kg = 110,000</td>
</tr>
<tr>
<td>Cost</td>
<td>Land Preparation = 30,000</td>
<td>Seeds = 100,000</td>
<td>Raw materials/Kg = 1,400-1,500</td>
<td>Raw material/100Kg = 70,000</td>
<td>Buying Price/100Kg = 73,000</td>
</tr>
<tr>
<td></td>
<td>Planting = 30,000</td>
<td>Planting &amp; commission = 50-70</td>
<td>Transport &amp; commission = 50-70</td>
<td>Milling = 7,000-10,000</td>
<td>Transport = 1,500</td>
</tr>
<tr>
<td></td>
<td>Weeding = 30,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Harvesting = 60,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Cost/Acre</td>
<td>250,000</td>
<td>Total Cost/Kg = 1,450-1,570</td>
<td>Total Cost/100Kg = 77,000-80,000</td>
<td>Total Cost/100Kg = 75,500</td>
<td>Total Cost/100Kg = 75,500</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>Per acre per season = 450,000-800,000 Kg/Season = 450-533</td>
<td>Per Kg = 50-270</td>
<td>Per Kg = 160-281</td>
<td>Per 100Kg = 5,500</td>
<td>Per 100Kg = 26,900</td>
</tr>
<tr>
<td></td>
<td>Per Kg = 50-270</td>
<td></td>
<td></td>
<td>Per Kg = 55</td>
<td>Per Kg = 345</td>
</tr>
</tbody>
</table>

Source: Value Chain analysis of the dry bean sub sector UNDP 2014
5.4.3 Sesame

The market is competitive at grassroots level, with a number of traders vying to purchase farmers’ outputs. However, as aggregation takes place the number of actors is reduced, shifting market power to fewer dominant players. The share of the price received by farmers falls from 90% of the ex-assembly price to 60% of the ex-regional wholesale price.

Our survey estimated average cost of production for sesame at UGX450,500/acre (UGX1.1m/ha), or UGX2,253/kg, with family labour as the main source of farm labour. The average sesame yield was 200kg/acre (494kg/ha), while the average unit price was UGX3,000/kg. Assuming that all output was sold, sesame production was generally profitable, with average margins of UGX149,500/acre (UGX369,000/ha), or UGX747/kg.

Table 10: Gross margin analysis: Sesame Production

<table>
<thead>
<tr>
<th>Total Revenue (UGX)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield (Kg/acre)</td>
<td>Price (UGX/Kg)</td>
</tr>
<tr>
<td>200kg</td>
<td>3,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Costs (UGX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land preparation</td>
</tr>
<tr>
<td>Seed</td>
</tr>
<tr>
<td>Planting / Sowing</td>
</tr>
<tr>
<td>Weeding and thinning</td>
</tr>
<tr>
<td>Harvesting and transporting to the rack</td>
</tr>
<tr>
<td>Rack construction and racking</td>
</tr>
<tr>
<td>Threshing and winnowing</td>
</tr>
<tr>
<td>Field-to-homestead transportation</td>
</tr>
<tr>
<td>Bagging and storage</td>
</tr>
<tr>
<td>Transportation to market</td>
</tr>
</tbody>
</table>

| Total Variable Costs (UGX) | 450,500 |
| Gross Margin per acre (UGX) | 149,500 |
| Unit Cost of Production (UGX/Kg) | 2,253 |

The gross margin accruing to rural traders was estimated at around UGX100/kg, and at UGX200/kg for urban traders. The retail price for sesame in Kampala stood at UGX4,200/kg, translating into a gross margin of UGX700/kg. Therefore, the total marketing margin or farm-retail spread, which is usually taken as a measure of efficiency of a value chain, was UGX1,200 per kg. In other words, sesame producers were able to capture 71.4% of the final retail price.

Table 11: Gross margin analysis: Sesame Trade

<table>
<thead>
<tr>
<th>Producer</th>
<th>Rural Trader</th>
<th>Urban Trader</th>
<th>Wholesalers</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prices (UGX)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UCOP = 2,253</td>
<td>BP = 3,000</td>
<td>BP = 3,100</td>
<td>BP = 3,300</td>
<td>BP = 3,500</td>
</tr>
<tr>
<td>SP = 3,000</td>
<td>SP = 3,100</td>
<td>SP = 3,300</td>
<td>SP = 3,500</td>
<td>SP = 4,200</td>
</tr>
<tr>
<td>Gross Margin (UGX/kg)</td>
<td>747</td>
<td>100</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Note: BP and SP are buying and selling prices; UCOP is unit cost of production; UGX is Uganda Shilling; USD1 = UGX3,590 at the time of survey
6. Market Functions

6.1 Transport

Infrastructure is being developed in Uganda, but currently does not meet the needs of the growing economy. With limited rail and air transportation, roads carry 95% of passenger and freight traffic (Obita 2015). Only 19% of the national road network is paved, increasing journey times and vehicle operation and maintenance costs. Access to feeder roads is also inadequate in many rural areas, affecting producers’ access to physical markets (MoFPED 2015). Uganda is landlocked and relies on Kenya (Mombasa) and Tanzania (Dar es Salaam), which are 1,100 and 1,600 km from Kampala, respectively, for accessing port infrastructure for international trade, making road transportation all the more important. In addition, only 14% of rural households have access to electricity, further constraining the production and marketing of goods (Coronel 2015). Thus, poor infrastructure raises transaction costs, increasing consumer prices and limiting profitability for chain actors.

6.2 Processing

6.2.1 Beans

Bean processors are yet to upgrade their processing technology to modern, efficient machinery. This is associated with a high capital coupled with a thin market for value added bean products. However, there is some indication of a growing market for processed beans.34 With increasing urbanization coupled with awareness on healthy eating, it is expected that bean preference will increase. The implication of urbanization and a high number of working class is that, people will have less time to boil beans which take long and would instead turn to processed beans and bean products. Market development for bean and bean products is an opportunity for the sector. The processing stage of the value is under-developed and cannot meet the changing consumer demands though more processors are introducing proven technologies that have been used elsewhere. Rotational steaming and precooking for canning and film packing are well-developed technologies.

6.2.2 Rice

At farm level, the processing of rice paddy through single-pass processes is well developed but not ideal if the rice is to be upgraded to a premium product. The primary process can cause breakages and loss of quality and is inferior to the multi-pass method (in which processing steps, such as pre-cleaning, de-husking, de-hulling, and paddy separation are performed separately) used by the larger commercial growers. In an ideal milling process the result is around 20% husk, 8–12% bran and 68–72% milled rice. Total milled rice contains whole grains or head rice, and 'brokens', which are non-ideal. The by-products of rice milling, such as husk and bran layers, can also provide valuable animal feed components, which are not recovered during single pass milling.

The most important aspects of upgrading processing to create a higher quality product are the whitening or polishing, grading and separation of white rice. These processes are not accessible to individual smallholders on-farm and, in their absence, output quality is limited.

6.2.3 Sesame

Sesame seeds need to be cleaned and fumigated to a high standard before supply to edible product markets. Some exporters have processing facilities in the production regions, mainly West Nile, Gulu and Lira. In Kampala, exporters screen, clean and package sesame into 50kg bags, which are packed into 20 and 40MT containers. Domestic processors are smaller in scale, handling limited volumes and processing into snacks for confectionary industries and into sesame paste for distribution to retail shops and supermarkets. Other small-scale processors operate in urban markets in lockups that mill and blend sesame with groundnuts into paste for application on bread.

Shares!, a Kampala-based company that finances, processes and exports organic sesame with a smallholder production system, uses a “natural fumigation” process developed in the Netherlands to achieve 99% and 99.9% purity seeds to EC/NOP and Biosuisse certified standards.

The extraction of sesame oil in Uganda is mainly done on an artisanal level using a pestle and mortar. After harvesting, seeds are washed, sieved and left to dry. They are then pounded until oil starts to collect and this is repeated until most of the oil is exhausted. The remaining residue is normally used to prepare local meals cooked with either smoked fish or vegetables, and in some cases used as animal feed.

Modern extraction methods used in the few sesame oil industries in the country, such as Kahangi Estate Organic Products, are the batch hydraulic press, where seeds are pressed to extract the oil, and continuous mechanical pressing, where they are squeezed through a funnel-shaped outlet and oil is expressed by increasing pressure. It is possible to further refine sesame oil through solvent extraction, neutralization and bleaching in order to improve its cosmetic aspects. However, sesame oil derived from quality seeds already possesses a pleasant taste and does not require further purification before it can be consumed. Many consumers prefer unrefined sesame oil due to their belief that the refining process removes important nutrients. Solvent extraction is common in China and India.

The three main stages involved in oil extraction are:

- **Cold press**: the oil obtained in this stage has a light colour and smell and is of very good quality.
- **Second stage pressing**: residue is subjected to high pressure, which extracts a deep brown oil that needs to be refined before consumption.
- **Third stage pressing**: the residue left after the second stage is subjected to more pressure to extract oil. This product is of very low quality used for non-edible purposes such as making insecticides, paint and cosmetics.

6.3 Storage

Both rice and beans benefit from proper storage facilities to prevent loss of quality through moisture ingress and rodent infestation. Commercial storage facilities are available in Kampala and in major towns less so in remote towns and villages (Obita 2015). The government reportedly has plans to spend US$11 billion on an extensive overhaul of transportation and electricity networks over the next 10 years (Coronel 2015).

6.4 Commodity exchange

Uganda East Africa Exchange (UEAX) is the national-level subsidiary linked to the greater EAX. Through the establishment of the commodity exchange and its supporting infrastructure, UEAX aims to promote the commercialization of the Uganda Agricultural sector and improve market access to Uganda smallholder farmers, linking them to markets across the East Africa Community Country regions. At this stage the UEAX support grain farmers but has not developed for rice and beans.
6.5  Intra-Firm Organisation

6.5.1  Horizontal and Vertical Linkages - Beans

The bean seed value chain is shorter than that for dry bean outputs and is mainly controlled by seed multiplier companies institutions, such as Victoria Seeds, FICA Seeds, NASECO, Community Enterprises Development Organisation (CEDO) and NACCRI. The companies procure samples from research and development institutions and have an established vertical contractual relationship with producers for seed multiplication. However, these linkages are weakened by side-selling of contracted outputs to other companies and commercial bean traders.

Seed companies grade the seeds and sell them to stockists and support organisations such as World Vision and government programs, such as NAADS. Onward linkages between input suppliers and the producers are not fully developed as many producers use own saved seed.

Horizontal relationships among producers are weak – few producer groups have been established for any agricultural commodities. However, local traders have established linkages with individual producers and trust-based pre-financing arrangements exist. The same arrangement also exists between village collectors and wholesalers during periods of high demand.

6.5.2  Horizontal and Vertical Linkages - Rice

Village assemblers buy paddy rice from smallholder producers and sell it to processors. Producer-trader relationships are often strong, with inputs or credit advanced by the buyers on a trust basis. Although producer organisations exist, they only perform aggregation functions for the purposes of selling unprocessed paddy to millers and traders.

6.5.3  Horizontal and Vertical Linkages – Seasame

Public-Private-Producer Partnerships Project of The Vegetable Oil Development Programme worked farmers in West Nile Region to develop and promote cooperatives to become involved in input supply, knowledge dissemination and marketing of commodities. However, such relationships are still weak.

Traders work independently and in most cases, transactions are carried out on cash basis. However, Uganda Oilseeds Subsector Platform (OSSUP) has provided a space for strengthening communication, information exchange and learning among the actors of the sub-sector at regional and national levels for policy and regulatory level. It also promotes “Public Private Producers Partnerships in Agricultural Value Chains” on operational and financing matters.

Trader-producer relationships are trust-based and often include pre-finance. Sesame wholesalers generally do not have contracts with their suppliers; those that do exist are seasonal. Price fluctuations, poor quality of produce, side selling and suppliers’ preference for advance payments or pre-financing hinder such formal arrangements.
7. Finance and Investment

Agricultural financing has enjoyed an upward trend since 2010, now comprising 10% of bank lending, which has increased for both production and processing activities. Around 93% of agricultural lending is done by commercial banks, the remainder made up of credit institutions and microfinance deposit-taking institutions (Bank of Uganda 2015).

7.1 Farmer Finance

Anderson et al. (2016) reported that nearly all Uganda’s smallholder households generate income from agriculture; 80% produce a saleable surplus and 35% rear livestock, poultry, fish, or bees. Only a limited proportion of smallholders stated that they earned income through means other than farming – 5% are also business or shop owners, around 12% have occasional waged employment, and 21% receive money from friends and family. The figure below describes the results of a smallholder income survey.

![Figure 20: Income Generating Activities of Ugandan Farmers](source: Anderson et al. (2016))

The same study found that some smallholders earn income from other activities in agricultural markets, such as buying products from other farmers for processing (3%) or resale (4%), service provision such as equipment rental equipment (2%), and rental of land (4%). Beyond agriculture, only 1% of smallholders received payments from the government, such as pension, disability, or welfare. Of this, more than half collected the money in cash, whilst one-third receive it via direct deposit to a bank account and 2% received them through mobile money.

Recently, there have been efforts by government, NGOs, processors, and traders to promote community-based organizations and area co-operative enterprises (ACEs), with the objective of linking farmers to markets, including large buyers such as Agrinet, Agroways, and Aponye.

Warehouse Receipts Systems (WRS) offer smallholders improved marketing through bulking of their produce, access to better storage facilities, access to credit whilst waiting for prices to increase, the
potential for increased prices through deferral of sale, and risk mitigation against damage of property (Bank of Uganda 2015).

There are also initiatives such as the One Acre Fund, a non-profit social enterprise that serves 280,000 farmers across Kenya, Rwanda, Burundi, Tanzania, Uganda, and Malawi (Bank of Uganda 2015). The Fund service bundle includes financing in the form of farm inputs with a flexible repayment schedule, distribution of improved seed and fertilizer, agricultural training, and post-harvest and marketing support. Products offered to over 1,000 farmers in Uganda include seed, fertilizer, solar lights, harvest drying sheets, and crop insurance. According to the Bank of Uganda (2015), this generated around US$140 in incremental profit per farmer per acre, and achieved a loan repayment rate of 96%.

7.2 SMAE Finance

Ugandan loan interest rates average 23%, in comparison with 9% in Kenya and 12% in Tanzania. Only around 30% of SMEs that are granted commercial loans pay them back in full (Farouk). Their low asset base offers weak security for lenders and, along with poor accounting and financial recording practices, makes them high-risk credit propositions (Farouk).

Consequently, 64% of SMEs rely on owner financing as the main or sole source of finance. Twenty percent access loan financing, and 11% use hire purchase financing (Farouk). Alternative forms of finance include:

- Micro-finance – from licensed institutions, NGOs, co-operatives and a range of associations offering savings, payments and insurance services to SME clients. MFIs serve rural areas flexibly at low costs. However, they often have weak operational and management systems, poor internal controls, limited access to technical assistance, and have a high dependence on donor funding. To address these issues, a capacity building centre has been set up at the Uganda Institute of Bankers;
- Lease Financing – only one leasing company currently operates in Uganda;
- Venture Capital Financing;
- Equity Financing – the Uganda Stock Exchange was set up in 1998, but most SMEs are unable to utilise it because of listing rules regarding disclosure requirements. Due to the lack of credible financial reporting in SMEs, they are often unable to provide this information to investors. Some SMEs such as Ugachick Ltd. and Commercial Microfinance Ltd. have received equity financing from the Development Finance Company of Uganda (DFCU), East African Development Bank (EADB), and the European Investment Bank (EIB) (Farouk), and;
- Credit Purchase Financing – for this type of financing to be successful, trust and reputation of SMEs need to be established with their suppliers. Exact figures are hard to come by, but SMEs in the retail industry have certainly benefitted from delayed payment for stock (Farouk).


7.3 Private Sector Investment

Uganda’s ranking in the World Bank’s 2017 Ease of Doing Business report has risen to 115th out of 190 countries – compared to 122 in the previous year. Furthermore, it ranks 12th out of the 48 economies in Sub-Saharan Africa, and third behind Kenya and Rwanda in the EAC. These recent gains have been achieved by on-going efforts to reduce construction permit acquisition requirements, improve access to electricity, and increase access to credit (Africa Business Group 2015).

Uganda also provides the following incentives for private sector investment:

- Uniform corporation tax of 30%, the lowest rate in the region
• Import duty exemptions for plant and machinery
• Duty draw-back facility for exporters
• A fully liberalised foreign exchange regime with no restrictions on the movement of capital in and out of the country
• A freely convertible and stable currency
• A special initial allowance (accelerated depreciation) of 50-75% on plant and machinery
• 100% initial allowance for training, scientific research and mineral exploration expenditures
• Value Added Tax (VAT) deferral facilities for plant and machinery
• First Arrival Privileges in the form of duty exemptions for motor vehicle and personal effects to all investors and expatriates coming to Uganda.

7.4 Government and Donor Investment

The Government National Agriculture Policy states that the role of the public sector in lending to agriculture will be to provide support in form of loan guarantees to encourage financial institutions to increase their portfolios to the sector. It emphasises the importance of public sector investment in risk management and mitigation measures in agriculture, including irrigation to reduce dependence on rainfall and weather-based insurance to hedge against weather related agricultural failure. The Government aims to utilise private capital for this, initially supported by the public sector through guarantees and capacity building where necessary (MAAIF 2011).

The following donor-funded programmes are active in the beans, rice and sesame sub-sectors:

Table 12: Other Donor-Funded Programmes

<table>
<thead>
<tr>
<th>Donor</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Fund for Agricultural Development (IFAD)</td>
<td>Ministry of Agriculture, Animal Industry and Fisheries, Vegetable Oil Development Project (VODP) - Phase 2; IFAD loan of USD52m. Completion set for December 2018. Identified as a problem programme by IFAD, progress in the oilseeds component has been limited and focused on sunflower and soybean.</td>
</tr>
<tr>
<td>European Union (EU)</td>
<td>Stabilizing Sesame Yields and Production in the Lango Region, Northern Uganda; EUR374,063 (EU contribution 80%). Aims at developing technologies and innovations that will intensify sesame productivity and commercialization by smallholders in the districts of Amolatar, Otuke and Lira districts as a way of contributing to food security and inclusive economic growth of the poor to mitigate the impact of increasing inequality and population growth</td>
</tr>
<tr>
<td>United Kingdom Department for International Development (UK DFID), TradeMark East Africa (TMEA)</td>
<td>Implementation of the East African Standard for Maize Grains and Development of a Standard for Sesame Seed in Uganda. Southern and Eastern African Trade Information and Negotiation Institute; USD300,000. The lack of a grain standard for sesame at both Uganda and EAC levels posed a challenge to meeting the market requirements of the targeted export destinations and affected market access for sesame. This project seeks to fill this gap.</td>
</tr>
</tbody>
</table>
| UK DFID | Northern Uganda: Transforming the Economy Through Climate Smart Agribusiness (NU-TEC). Support is targeted at agribusinesses under a market systems development approach and expected impacts are:  
197,500 households (300,000 adults and 600,000 children) with improved incomes (household cash income derived from agriculture increased by 15%)  
331,150 direct beneficiaries (1.76m when including indirect household beneficiaries) with improved resilience to climate change, of whom at least 35% |
are women
The key outcome is £81m additional turnover within businesses, attributed to project interventions.
The NU-TEC project consists of three main components, as well as an M and E component:
• Market Systems Development (MSD): Market systems development services, and technical assistance, to private agribusiness. Palladium is delivering this five year £14 million contract, to end in May 2020.
• Specialised Credit Fund (SCF): Delivery of medium term credit to agribusiness through a Ugandan financial institution, awaiting formalisation of the contract
• Long Term Investment and Capacity Building (AgDevCo): Long term equity and credit to agribusiness through AgDevCo, a not-for-project investment vehicle. £12 million has been committed to AgDevCo.
An £800,000 contract has been awarded to Oxford Policy Management for Annual Reviews, Monitoring and Evaluation. An additional £10 million is available to be allocated to areas of greatest emerging potential.
The programme is working in the following markets: aggregation and storage; land preparation; seeds; sunflower; soybean; carbon markets; feed.

Embassy of the Kingdom of the Netherlands (EKN)
Integrated Seed Sector Development (ISSD) Uganda; implemented by Wageningen University and Research Centre - Centre for Development Innovation (WUR-CDI). Aims to build upon the strengths of both the formal (public and private) and informal (farmers and community-based) seed systems and seeks to consolidate them. Guides specific interventions in identified seed systems; linking food and seed security to private sector development and aligning and harmonising seed policies, laws, regulations, interventions, programmes and practices.

Upland Rice Millers Ltd./Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)/Korean International Agency (KOICA)
Agro-processing and Marketing Strategy in Uganda (APM) Project MoU signed on 20th Oct 2016 but started in June 2017; duration 7 years. Objective is to develop agro-processing and marketing strategies of rice and maize in Uganda. Six farmer groups have signed a MoU with Upland Rice Millers.

The World Bank
Agricultural Cluster Development Project (ACDP), 2015-22. The project development objective for the Agriculture Cluster Development Project for Uganda is to raise on-farm productivity, production, and marketable volumes of selected agricultural commodities in specified geographic clusters. The proposed project will adopt a phased approach, starting in a small number of clusters with one or two commodities, and then building toward broader geographic coverage including all five selected commodities.

UK DFID, KfW, SIDA, DANIDA, USAID, Dutch Development Cooperation, Crossroads
Agricultural Business Initiative Trust (aBi). Multi-donor trust providing financing and technical support in selected agricultural value chains, including beans and sesame. In beans, 48% of participating farmers have been GAP certified and been supported to increase productivity (the Trust cites improvement of average output from 250kg/acre)
8. Enabling Environment

8.1 Government Institutions, Policy, Strategy and Programmes

There are eight semi-autonomous bodies that report to the MAAIF for policy guidance:

- National Agricultural Research Organisation (NARO)
- National Agricultural Advisory Services (NAADS) for delivery of advisory services;
- National Animal Genetic Resource Centre and Data Bank (NAGRC&DB) for animal genetic development;
- Coordinating Office for the Control of Trypanosomiasis in Uganda (COCTU)
- Dairy Development Authority (DDA)
- Uganda Coffee Development Authority (UCDA)
- Cotton Development Organisation (CDO)
- Plan for Modernisation of Agriculture Secretariat (PMA)

In 2011, the MAAIF drafted Uganda’s National Agricultural Policy (NAP), which outlined low productivity, limited value addition to agricultural produce, lack of access to markets, and weak regulatory environment as the core challenges to Uganda’s agricultural development. It set out guiding principles with a mission to “Transform subsistence farming to sustainable commercial agriculture”.

The NAP states that the biggest gains will be obtained from using improved inputs including seed, stocking and planting materials, in order to boost productivity. There is also emphasis on better utilising technological and scientific advancements.

The Agriculture Sector Strategic Plan (ASSP) for 2015/16-2019/20 provides a guidance framework for identifying sector investments that will target increased production and productivity in selected priority commodities. It is inspired by, and aligned to, a series of international, regional, and national objectives and policies, including the UN Sustainable Development Goals, the Comprehensive Africa Agriculture Development Programme, Uganda Vision 2040, the National Development Plan 2, Operation Wealth Creation, and the NAP. Under the ASSP, the overall goal of the agriculture sector is to achieve an average growth rate of 6% per year over the next five years. It aims to achieve this through four strategic priorities:

- to increase production and productivity of agricultural commodities and enterprises;
- to increase access to critical farm inputs;
- to improve access to markets and value addition and strengthen the quality of agricultural commodities, and;
- to strengthen the agricultural services institutions and the enabling environment.

The key outcome targets of the ASSP are:

1. Increase productivity by farmers to at least 50% of the yields at research stations for the 12 priority commodities;
2. Transform subsistence farmers (growing for consumption) into enterprise farmers (growing for consumption and responding to market needs) and transforming smallholders farmers into commercial farmers;
3. Increase food security and food availability in all parts of the country;
4. Increase agriculture exports to at least $4bn per year, and;
5. Reform and strengthen agricultural service institutions such as research, extension and regulatory bodies to make them effective and efficient.
ASSP prioritises 12 commodities and four strategic commodities based on their contribution to household income and food security. For beans, the ASSP targets production of 10m MT by 2020, with annual exports projected to increase to US$63m. In order to achieve these targets, the sector intends to increase production and productivity through increasing access to high quality seed inputs like Rhizobia, support pest and disease control, and strengthen mechanisation and extension services.

Sesame is not mentioned specifically but the targets for oilseeds production is to double 2014 levels to 2,027,800MT by 2020, and exports from vegetable oils to increase from US$102m to US$281m through:

1. Increasing productivity and production through improved distribution and access to improved quality seed, fertilisers, mechanisation and extension services;
2. Strengthening and increasing access to extension services by farmers;
3. Building and strengthening farmer organisations to sustainably provide services to their members;
4. Increasing access to credit by farmers and processors through the provision of agricultural finance;
5. Reducing post-harvest losses by promotion, capacity building and distribution of appropriate technologies;
6. Promotion of collective marketing of high quality oilseeds;
7. Strengthening the oilseeds sub-sector platform to oversee and coordinate relevant policies.

The National Agricultural Research Organization (NARO) conducts research through its National Arid Resources Resource Institute (NaSARRI) on higher yielding, higher oil content varieties, of which it has released two (Sesim I and II).

For rice, the ASSP targets production of 680,000 MT by 2020, generating at least US$73m worth of exports. To achieve this, the sector aims to increase the production and productivity of rice farming through the multiplication and distribution of improved foundation seed, mechanisation, investment in irrigation infrastructure starting with Eastern Uganda, and provision of extension services. Moreover, to reduce post-harvest losses the sector intends to promote and distribute appropriate post-harvest technologies, increase access to credit by rice farmers, traders and processors and promote marketing of rice by promotion of collective marketing for high quality rice.

The MAAIF has also drafted the National Rice Development Strategy (NRDS). Its stated goal is to increase household food security and reduce household poverty in Uganda through increased production of high quality rice. Specifically, the NRDS aims at rice self-sufficiency in Uganda by 2018 through:

- strengthening the institutions for production;
- improving the production, multiplication and dissemination of certified seeds;
- minimizing post-harvest losses through improved post-harvest handling and processing technologies;
- improving research, technology dissemination and capacity building;
- increasing sustainable utilization of fertilizers, other agro-inputs and farm resources for maximum yield;
- improving and increasing sustainable water use and management;
- enhancing mechanization of the rice sub-sector in order to minimise cost of farm labour, and;
- increasing agricultural finance.
8.2 Non-governmental and private sector organisations

In addition to national private sector organisations, several NGOs operate in northern and eastern Uganda, working with clusters of farmers to promote improved livelihoods through promotion of improved technologies, linking farmers to markets through formation of groups and dissemination of market information, promotion of organic agricultural practices through farmer training and facilitation of certification of organic produce. Such organizations include:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Organic Agricultural Movement of Uganda (NOGAMU)</td>
<td>Umbrella organization that represents producers, processors, exporters, NGOs and other institutions and organizations involved in the promotion and development of the organic sector in Uganda. Has six main areas of work: advocacy and strategic relations; marketing and value chain development; training, research and extension; standards and certification; consultancy and focus group services. Has market information services and promotes organic produce.</td>
</tr>
<tr>
<td>Uganda Oil Seed Producers and Processors Association (UOSPA)</td>
<td>Umbrella association of oil-seed crop producers (farming communities), oil-seed crop processors and other oil-seed crop stakeholders, including policy makers, traders, researchers and consumers of oil-seed products. Current membership includes 65 small- and medium-scale milling industries 947 farmer groups comprising 47,350 farmers. Work areas are: business development support; institutional and skill development (production, post-harvest handling, processing, organizational development); marketing and input supply; support with credit sourcing; sector coordination.</td>
</tr>
<tr>
<td>Rice Millers Council of Uganda (RMCU)</td>
<td>Founded in 2015 by the Ministry of Trade, Industry, and Cooperatives. Currently comprised of 16 medium- and large-scale millers and an associate member (IFDC). Conducts policy advocacy and interfaces with Government, development partners and other stakeholders, and provides representation for all those engaged in the sector. Estimates that there are around 20 medium- and large-scale millers and 850 small-scale processors in Uganda, sourcing from 400k smallholders under two main models – trade-based, where rice is purchased, and milling service provision, where it is milled for a fee without a change in ownership.</td>
</tr>
<tr>
<td>Grain Council of Uganda (TGCU)</td>
<td>A non-profit membership organization registered in 2012. Brings together key stakeholders along the grain value chains. Strives for greater efficiency and effectiveness for increased competitiveness. A platform for collaboration and coordination of activities in grains markets.</td>
</tr>
<tr>
<td>Private Sector Foundation (PSFU)</td>
<td>Uganda's apex body for the private sector composed of over 200 business associations, corporate bodies and the major public sector agencies that support private sector growth. Serves as a</td>
</tr>
</tbody>
</table>
focal point for private sector advocacy, capacity building and policy dialogue with Government.

| **Uganda Manufacturers Association (UMA)** | Represents the interests of industrialists to Government |
| **Uganda National Farmers Federation (UNFFE)** | The largest private sector, farmer-based, umbrella membership Non-governmental Organization (NGO) in Uganda (and one of the largest in East and Central Africa). Advocates for, lobbies and articulates farmers’ developmental issues and programmes. Its membership is composed of over 90 independent associations of farmers, agro-industrialists and agro-commodity dealers whose individual membership is over 1,000,000, of whom about 40% are women. The greatest membership segment is comprised of 70 District Farmers Associations (DFAs), which are spread across the Northern, Eastern, Central and Western regions of the country. |
| **Volunteer Efforts for Development Concern (VEDCO)** | NGO with an agricultural development workstream covering the areas of strengthening producer organisations, agribusiness and value chain development training, market linkage and access to finance. Works in over 22 districts. Also performs policy advocacy work. |

8.2.1 Market interventions

Under the Government’s Plan for Modernisation of Agriculture, several key priority areas have been highlighted for intervention and action by the public sector:

- Research and Technology Development – The Uganda National Council of Science and Technology (UNCST) is the apex organisation for Uganda’s research system. The mandate for agricultural research is delegated to the National Agriculture Research Organisation (NARO), but 75% of NARO institutes are located within a 30km radius of Kampala, implying the need for a decentralisation process. Priority research areas include technology development and multiplication, socio-economic research, strategic research; farm-power and post-harvest technologies; and land and water resources management.

- National Agricultural Advisory Service – The delivery of technical messages to farmers has previously been done by Government agricultural extensionists who have also administered the delivery of various inputs and/or support and service programmes. These services were effective until the political turmoil that occurred in the 1980s, and efforts to revive it since have failed. The Government plans to address this, with a vision of “decentralised, farmer owned and private sector serviced advisory services, contributing to the realisation of the agricultural sector objectives”.

- Agricultural Education – Poor farmers have identified low education levels, ignorance, lack of information and lack of skills as factors influencing their inability to access and benefit from livelihood opportunities. The Government proposes to develop an engendered Agriculture Education Policy that encompasses the promotion of agriculture as a business, treatment of agriculture as a branch of applied science focusing on experiential learning, discouraging the use of agriculture as punishment in schools, application of multi-disciplinary approaches, encouragement of participation, recognition of indigenous knowledge and the incorporation of
the community and the decentralised system of local government in the implementation of agricultural education.

- Improving Access to Rural Finance – in order to realise the vision of “an efficient nationally integrated system of financial institutions and intermediaries capable of accomplishing financial intermediation in rural areas”, key priority areas will be developing an effective legal and regulatory framework, capacity building for MFIs, privatisation of Government credit programs, Government transfer of UCB branches promotion of other MFI initiatives, and promotion of formal banking system involvement in rural finance;

- Agro-processing and Marketing – strategies for improving market access include improving and expanding the road network, growing the means of transport, improving market infrastructure, providing access to market information, providing access to the international market, investing in storage facilities and agro-processing activities, and improving access and quality to agricultural inputs;

- Sustainable Natural Resource Utilisation and Management – this includes improved policies on land utilisation, water for production, forestry, and climate change issues, and;

- Physical Infrastructure – including roads, electricity, water, and communication.

8.3 Regulatory Framework

The policies and objectives set out by the NAP and ASSP will be implemented by the Government of Uganda, through the MAAIF and associated stakeholders. The below table sets out the Ugandan agricultural sector players and their roles according to the ASSP (MAAIF 2016).

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Responsibilities</th>
</tr>
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</table>
| MAAIF               | a) Act as the lead agency in the implementation of the ASSP.  
                     | b) Policy formulation, regulation and quality control;  
                     | c) Establish the structure for coordinating, monitoring and evaluating ASSP;  
                     | d) Develop and disseminate guidelines to operationalise the ASSP;  
                     | e) Build the capacity and collaborate with other stakeholders to ensure mainstreaming of ASSP interventions in their respective programmes and plans;  
                     | f) Strengthen collaboration and networking with the stakeholders to promote mutual appreciation/ understanding, guidance, involvement and community support for ASSP interventions;  
                     | g) Develop the ASSP operational plans;  
                     | h) Reviewing and strengthening linkages between MAAIF HQ, Agencies, ATIs and DLG production departments; ASSP 2015/16 to 2019/20 Draft 68 Institutions  
                     | i) Periodically review and restructure MAAIF to ensure adequate alignment with the implementation requirements of the ASSP  
                     | j) Provide for the establishment of requisite approved structures and employment of personnel and ensure their effectiveness by equipping them as required |
| Sector Agencies     | a) Strengthen the structures of the sector Agencies to enable them carry out their mandate to extend to services in line with increasing agricultural production and commercialisation. |
| Sector Ministries   | a) Translate the ASSP into sector-specific strategies and activities;  
                     | b) Collaborate with the MAAIF on matters of mainstreaming ASSP priority concerns in their respective sector interventions.                                                                                      |
| Local Governments   | a) Ensure that the local government development programmes are in line with objectives of increasing production and commercialisation of agriculture;                                                                 |
b) Strengthen the structures of the LGs to enable them to effectively execute country-wide mandate to extend quality service delivery in the agricultural sector;  
c) Delivery of field-level agricultural services to the population.  
d) Monitor mainstreaming of ASSP interventions in local governments to ensure services benefit them;  
e) Collaborate with MAAIF on matters of increasing production and commercialisation of agriculture;  

a) Support the implementation of the ASSP;  
b) Ensure consideration and alignment of ASSP priorities in development of cooperation partnerships;  
c) Establish appropriate institutional/donor coordination mechanisms for ensuring responsiveness of development cooperation towards the achievement of the ASSP objectives;  

a) Participate in Sector Working Groups and local government planning and budgeting processes to advance farm productivity  
b) Develop and implement programmes that address key ASSP intervention areas;  
c) Farm production, agro-processing and marketing of agricultural output;  
d) Collaborate with MAAIF and other appropriate institutions on matters of mainstreaming of increasing production and commercialisation of agriculture;  
e) Complement Government in delivering of agricultural services to farmers;  
f) Strengthen good agricultural practices (GAPs), agribusiness and market development services and governance  
g) Establish PPP initiatives aimed at increasing production and commercialisation of agriculture;  

a) Establish collaborative partnerships with MAAIF, agencies and LGs  
b) Contribute to agricultural research  
c) Review curricula to respond to labour market needs  
d) Provide high quality relevant practical training  

a) Jointly form PPPs  
b) Provide complimentary interventions for ASSP implementation  

a) Form farmer groups and other institutions  
b) Implement production and productivity enhancing interventions  
c) Define and articulate needs  

The specific challenges to the beans, rice and sesame value chains provided by Uganda’s infrastructure are as follows (USAID 2014):  
- There is a lack of rural drying and storage facilities;  
- Rice is not part of a warehouse receipt system;  
- Rural rice hullers exist but are of poor quality. They generally produce a high proportion of broken rice;  
- Distribution of rice processing capacity is limited by the electricity grid;  
- Diesel-operated mills are smaller and more expensive to run;  
- Vehicle wear and tear, high running costs and delays all reduce profits for farmers and margins for traders;  
- Costs of inputs increased because of transport and transaction costs;  
- These high costs encourage counterfeiting and sale of fake inputs, especially agro-chemicals.
9. Potential interventions

9.1 Sesame

9.1.1 Linking Smallholders with Markets and Agribusinesses

Investment 1: Promotion of improved sesame varieties

CASA could facilitate a smallholder-based improved sesame seed multiplication programme for varieties such as Sesame 2. Gulu would be a suitable venue for a pilot programme, in partnership with NU-TEC. A firm such as the Gulu Agricultural Development Company (GADC) would work with Gulu Farmers and Produce Dealers Association (GFPDA), obtaining foundation seed from the National Agricultural Research Organisation (NARO). The seed would be collectively multiplied by selected farmers' groups for sale to other producers, with the necessary technical knowledge disseminated by GADC. Cooperatives could be facilitated to obtain credit on behalf of members for procurement of improved seeds and tractor hire services.

Investment 2: Strengthened horizontal linkages for smallholder sesame producers

In order to facilitate collective input purchase and output marketing, CASA could support GFPDA to strengthen and/or create farmers’ associations, or cooperative societies, in each of six districts in Gulu as a pilot project. Ultimately, the model could be replicated in Lira and other sub-regions of Northern Uganda. The associations or societies would engage in assembling, cleaning, grading and storage of sesame for sale to buyers such as Olam, ETG, AgriExim, Shares! and Lira Resort. GADC could provide farmer training in post-harvest handling and agribusiness.

9.1.2 Supporting Agribusiness to Prepare for Investment

Investment 1: Capacity building of sesame traders

Poor quality sesame seed outputs are often the result of poor handling and storage practices by traders. In order to develop these trading businesses and make them a more attractive investment prospect, CASA could facilitate training in good practices by GADC, while investigating potential sources of small loans for upgrading of infrastructure such as storage and marketing premises, weighing scales, tarpaulins, and so on.

9.1.3 Enabling Environment

Several buyers – including Shares! and AgriExim – would like to source organic sesame in Uganda. This higher value product is not subject to the same price volatility as conventional sesame and commands a premium. However, there are conflicts among organic food production and other activities, notably the GoU’s malaria control programmes through the Ministry of Health, in which large swathes of rural areas are treated with insecticides, notably DDT, contaminating crops and rendering them in violation of organic production standards.

The National Organic Agricultural Movement of Uganda (NOGAMU) and Uganda Oil Seed Producers and Processors Association (UOSPPA) are two examples of stakeholder organisations that could engage in dialogue among their member organisations and local and national Government to examine instances where development and land use priorities are conflicted.
In 2016, Trademark Africa worked with the Southern and Eastern Africa Trade Information and Negotiations Institute (SEATINI) to develop a standard for sesame. There may be an opportunity for CASA to support the implementation of this standard.

9.2 Rice

9.2.1 Linking Smallholders with Markets and Agribusinesses

Investment 1: Promotion of use of improved rice inputs to enhance productivity

CASA could promote use of improved rice varieties and fertilizer among project farmers in order to increase rice productivity and production, working in partnership with JICA, rice buyers and NARO, which could supply OPV foundation seed, and selected farmers’ groups. Seed could be distributed to farmers by buyers under the “One Kilogramme” model, in which recipients of one kilogramme of improved seed promise to provide the same quantity to group members upon harvest. Other financing models for sustainable linkage to seed sources could also be investigated with implementing partners during the project design phase. OPV seed could be recycled for two years.

For fertilisers, CASA could work to support the World Bank funded Agricultural Cluster Development Project (ACDP) in MAAIF, in which licensed private companies deliver and sell it to farmers at their cooperatives under an e-voucher system. IFDC and MAAIF could provide technical support in best practices for fertiliser use. Cooperatives could be facilitated to mobilize agricultural credit for members.

Investment 2: Enhancement of rice post-harvest handling, value addition, and marketing

In partnership with MAAIF, the Ministry of Trade, Industry and Co-operatives (MTIC), and rice buyers, CASA could facilitate capacity building of farmers’ groups and associations to become cooperative societies that will engage in collective marketing of produce in each district. The societies would take on the functions of assembly, cleaning, grading, and improved storage of rice. Three medium-sized rice millers (Pearl, Divine Masters and Eastern Rice) are potential partners for piloting a forward marketing contract system. Market information could be provided to farmers, traders, and millers under a public private partnership between MAAIF, MTIC and private market information service providers such FIT (U) Ltd.

9.2.2 Supporting Agribusiness to Prepare for Investment

Investment 1: Capacity building of traders and millers for enhanced rice quality

CASA could provide rice buyers and processors with technical assistance on attaining quality standards, and linked to loan facilities to procure post-harvest handling equipment, such as moisture meters, and more modern processing machinery, such as de-stoners.

9.2.3 Enabling Environment

Rice production requires large volumes of water and has been associated with wetland destruction. There is also the potential for pollution (nutrient enrichment leading to ecosystem change) from fertiliser run-off and, for upland rice, for further deforestation from “slash and burn” shifting agriculture. There needs to be dialogue between the National Environmental Management Authority (NEMA), farmers’ representative groups, MAAIF, JICA and other interested stakeholders on eliminating or mitigating environmental damage, for example through standards in conservation agriculture and zoning of rice production according to impact assessments.

Secondly, there is a need to form an apex association for rice farmers – a National Rice Farmers’ Association – in order to represent producers’ interests to Government. In addition, the Uganda Rice...
Millers Council (URMC) could be strengthened. In the interim, the Rice Secretariat established with support from JICA could assist in bringing all rice value chain stakeholders together for policy dialogue, for example in land use planning conflicts and brown import policy.

9.3 Beans

9.3.1 Linking Smallholders with Markets and Agribusinesses

Investment 1: Promotion of use of improved inputs to enhance productivity and production

CASA could promote use of improved bean varieties and fertilizer among project farmers in order to increase bean productivity and production, working in partnership with VEDCO, bean buyers and NARO, which could supply foundation seed, and selected farmers’ groups. As with rice, seed could be distributed to farmers by buyers under the “One Kilogramme” model, or other financing models for sustainable linkage to seed sources developed with implementing partners during the project design phase. A pilot would take place in the five districts in which VEDCO is currently operating.

Again in parallel to the rice intervention, CASA could work with ACDP, with support from MAAIF and cooperatives for credit supply and technical assistance.

Investment 2: Enhancement of beans post-harvest handling, value addition, and marketing

In partnership with MAAIF, the Ministry of Trade, Industry and Co-operatives (MTIC), VEDCO and bean buyers, CASA could facilitate capacity building of farmers’ groups and associations to become cooperative societies that will engage in collective marketing of produce in each of five districts. The societies would take on the functions of assembly, cleaning, grading, and improved storage of beans. Buyers such as traders, Agroways, Upland Rice Millers and the UN WFP are potential partners, and VEDCO is a potential implementing partner for producer training. Market information could be provided to farmers, traders, and millers under a public private partnership between MAAIF, MTIC and private market information service providers such FIT (U) Ltd.

9.3.2 Supporting Agribusiness to Prepare for Investment

Investment 1: Formalisation and structuring of beans trade

To promote structured trading, bean traders/aggregators could be trained on post-harvest handling management and quality standards and linked with Agroways and Upland Rice Millers with modern equipment and technologies, such as grain driers and cleaners, moisture meters and triple bags. CASA could also facilitate strengthening of vertical relationships between traders at different levels so that market information flows improve and the marketing system is more responsive to end user preferences.

9.3.3 Enabling Environment

In order to foster policy dialogue, there is a need to form an apex association for bean farmers and traders at the national level – National Beans Farmers Association and National Beans Traders Association – in addition to strengthening the Beans Secretariat established with support from USAID.
10. Recommendations

10.1 Increasing the quality and quantity of sesame seed offered for sale

With inputs of facilitation and technical assistance from CASA, a pilot could initially target 30,000 farmers in six districts of Gulu. Given that sesame seed multiplication rate is very high, with the seed rate being 1-2 kg/acre (around 2.5-5kg/ha), and assuming that each 2kg planted yields at least 200kg to be distributed to farmers, the output would be 4,000MT at the end of year two.

By using improved seed with the correct agricultural practices, smallholders’ yields could increase from 100MT/acre (247MT/ha) to 300MT/acre (741MT/ha) through adoption of improved varieties and good agricultural practices. Marketable surpluses might increase from 63% to 75%. In addition, post-harvest losses could be reduced by 10% along the value chain. We estimate that these changes could result in 30% income increases, equivalent to around USD24/smallholder/year, to sesame producing households, through increased sales as the result of greater productivity and lower loss levels, all else being equal (sesame global market prices are somewhat volatile).

10.2 Increasing the quality and quantity of rice offered for sale

CASA could potentially reach 15,000 farmers in three selected districts in eastern Uganda. Given that the rice seed multiplication rate is 100 and seed rate is 50kg/acre (123kg/ha), assuming that 1kg of planted seed yields at least 50kg output, 1 acre would output 2.5MT (6.2MT/ha) in one year (one growing season). Farmer adoption of fertiliser might reach 25% and productivity could rise from 2.5MT/acre (6.2MT/ha) to 4MT/acre (9.9MT/ha), around 80% of potential yield. Post-harvest losses might be expected to decline from 30% to 10% and a rice-producing household could potentially increase income from rice by 50%, equivalent to around USD60-110/smallholder/year (depending on yield) based upon our assumptions of greater productivity, increased quality and better prices.

10.3 Increasing the quality and quantity of beans offered for sale

We assume that the bean seed multiplication rate is 40 and seed rate is 40 kg/acre, 1 kg planted yields at least 20 kg, and that on giving back 1kg, a farmer retains 20kg that will plant 0.5 acre with total output of over 0.4 MT over two growing seasons. The proportion of project farmers using improved seeds and fertilisers might reach 75% and 25%, respectively. This would result in productivity increases from 500 MT/acre to 1,200 MT/acre (75% of potential yield) over two seasons, a 20% decline in post-harvest losses and an increase in marketable surplus from 20% to 50% in beneficiary farming households. This increased output (and, therefore assumed sales) and reduced losses might translate into an income increase of 50%, equivalent to around USD21/smallholder/year, all else being equal. Clearly, if there were large-scale increases in bean output, local prices may be depressed, depending upon demand side dynamics.

10.4 Potential SME partners

Table 15: Potential SME partners

<table>
<thead>
<tr>
<th>Business</th>
<th>Sector</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agroways Ltd.</td>
<td>Beans</td>
<td>Operates in one of the major beans growing areas of Uganda (Busoga sub-region). Bean surpluses could be aggregated at farmer group level and delivered to Agroways for cleaning, drying, storage and sale, which has eight satellite stores managed by farmer groups.</td>
</tr>
<tr>
<td>Upland</td>
<td>Rice</td>
<td>Also located in the Busoga sub-region, where both beans and rice are</td>
</tr>
<tr>
<td>Company</td>
<td>Crop</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Millers Ltd.</td>
<td>beans</td>
<td>produced and traded.</td>
</tr>
<tr>
<td>Divine Masters Ltd</td>
<td>Rice</td>
<td>Has stated plans to bring more smallholders into rice production.</td>
</tr>
<tr>
<td>Eastern Rice Company Ltd.</td>
<td>Rice</td>
<td>Has stated readiness to engage with more smallholder farmers if supported.</td>
</tr>
<tr>
<td>Pearl</td>
<td>Rice</td>
<td>Will receive an IDB loan, but only for construction of dams.</td>
</tr>
<tr>
<td>Gulu Agricultural Development Company (GADC)</td>
<td>Sesame</td>
<td>Works with a large number of smallholders. Although it has received some support, CASA could facilitate expansion of its smallholder engagement.</td>
</tr>
<tr>
<td>Lira Resort</td>
<td>Sesame</td>
<td>The only potential SME operating in the Lango sub-region, a major producer of sesame.</td>
</tr>
</tbody>
</table>
11. Annexes

Annex A: Bibliography of Value Chain Resources


Farouk, S. () “Financing Small and Medium Enterprises: A Major Hindrance to Eradication of Extreme Poverty in Uganda”, AfDB

GIEWS - Global Information and Early Warning System Uganda country brief - Reference Date: 14-November-2016


MFPED (2014) “Distribution of Agricultural Inputs in Uganda: what are the key challenges?”, BMAU Briefing Paper 8/14


UIA (2016) “SMEs Driving the Economy”, Available at: https://www.ugandainvest.go.ug/smes-driving-economy/


## Annex B: Stakeholders Consulted, Beans and Rice

<table>
<thead>
<tr>
<th>Name &amp; Address</th>
<th>Overview</th>
<th>Current Activities in the Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ms. Grace Nanyonjo</strong>&lt;br&gt;Uganda Legumes Research Programme&lt;br&gt;National Crops Resources Research Institute, NARO, +256(0)771 471 984&lt;br&gt;<a href="mailto:nanyonjograce1@gmail.com">nanyonjograce1@gmail.com</a></td>
<td>The programme is mandated to generate and disseminate technologies for enhanced production of dry beans and soybeans. It generates materials for improved yields, tolerance to pests and diseases, climate change, etc.</td>
<td>The bean research programme has just ended a 33-months’ project for promotion of pre-cooked bean products innovations in the beans value chain i.e. value addition to increase trade. The farmers were linked to specialized output markets. Bean varieties suitable for pre-cooked beans processing have been identified and available for multiplication.</td>
</tr>
<tr>
<td><strong>Mr. David WozembaWetaka</strong>&lt;br&gt;Senior Technical Manager&lt;br&gt;NU-TEC Market Development Palladium Group (U) Limited&lt;br&gt;+ 256 (0) 786 986 065&lt;br&gt;<a href="mailto:david.wozemba@thepalladiumgroup.com">david.wozemba@thepalladiumgroup.com</a></td>
<td>Transforming the Economy through Climate Smart Agri-Business Market Development programme aims to increase the incomes and climate resilience of poor men and women in Northern Uganda.</td>
<td>David was interviewed as a beans expert although NU-TEC does not support the beans value chain.</td>
</tr>
<tr>
<td><strong>Mr. Boniface, B. Mugisa</strong>&lt;br&gt;Team Leader&lt;br&gt;Legume Seeds Pilot&lt;br&gt;AgResults, Lutheran World Relief&lt;br&gt;+ 256 (0) 784 769 837 / 757 964 606&lt;br&gt;<a href="mailto:bmugisa@lwrearo.org">bmugisa@lwrearo.org</a></td>
<td>Project employs a pull mechanism to incentivize seed companies to produce and sell quality verified bean and soybean seed varieties to smallholder farmers across Uganda.</td>
<td>The pull mechanism consists of two parts (1) an annualized prize that provides a premium on seed sales growth; and (2) access to cold storage to allow companies to carry over unsold seed from one season to the next. Prizes are distributed after an independent verifier confirms the amount of seed sales reported.</td>
</tr>
<tr>
<td><strong>Mr. DidasKumwesiga</strong>&lt;br&gt;Trade and Policy&lt;br&gt;FtF EEA Activity&lt;br&gt;+ 256 (0) 776 281 163&lt;br&gt;dkumwesiga2ugandaeeaa.com</td>
<td>The Activity works with the public and private partners to create a better regulatory framework for farmers and agribusinesses</td>
<td>• Improving policy, legal and regulatory frameworks that affect agricultural production and trade. • Help policymakers and the private sector adapt to the effects of climate change on agriculture.</td>
</tr>
<tr>
<td>Name &amp; Address</td>
<td>Preamble</td>
<td>Current Activities in the Sector</td>
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</tr>
</tbody>
</table>
| Mr. Robert Anyang  
Chief of Party (USAID)  
FtF CPM Activity  
+ 256 (0) 776 666 018  
ranyang@ftfcpm.com | The activity focuses on strengthening the maize, bean and coffee value chains. The target beneficiaries are the farmers and agribusiness including traders, processors and exporters | • Enhancement of crop productivity and production  
• Making support services for farmers more accessible and more effective  
• Improving economic output  
• Strengthening inter-actor relationships for more effective movement of products and information between buyers and sellers and promoting access to competitive markets |
| Dr. Joseph Oryokot  
World Bank,  
Agriculture Cluster Development Project,  
+ 256 (0) 772 288 806  
joryokot@worldbank.org | Technical Assistance to MAAIF by World Bank facilitated ministerial task teams and systematic consultative workshops that came up with an Action Plan forming the basis for the proposed Agriculture Cluster Development Project (ACDP). Beneficiaries are farmers and other value chain actors i.e. farmers’ Associations and private sector actors. The project will work with approximately 450,000 farming households producing maize, beans, rice, Robusta and Arabica coffee and cassava. | • Support for Intensification of On-Farm Production. Participating farm households will benefit from greater efficiency, larger volumes of on-farm production and more favourable prices for inputs as well as for marketed produce.  
• Market Linkages, Post-Harvest Handling, Storage and Value Addition. The involvement of wholesale buyers, input dealers, rural banks and commercial farmers is crucial in establishing linkages to ensure effective access to productive assets, capital, services, technical know-how, and markets.  
• Project Management, Policy, Regulatory, and ICT functions of MAAIF. The development of agricultural input supply chains as well as the development of the marketing and distribution system for both domestic sales and exports of the commodities will be done with particular focus on the policy and regulatory issues affecting agricultural value chains. |
| Mr. Henry Nakeletopolot  
Assistant Commissioner  
Development of agricultural Infrastructure and Water for Agricultural Production  
Ministry of Agriculture, Animal Industry and Fisheries  
+ 256 (0) 772 585 140  
hnopolot@gmail.com / hnoplot@agriculture.go.ug | | |
<table>
<thead>
<tr>
<th>Name &amp; Address</th>
<th>Overview</th>
<th>Current Activities in the Sector</th>
</tr>
</thead>
</table>
| **Dr. Jimmy Lamo**  
Principal Research officer / Rice Breeder  
National Crops Resources Research Institute, NARO  
+ 256 (0) 772 342 757  
jlamoayo@gmail.com | The programme is mandate to generate and disseminate technologies for enhanced production of rice. Materials are generated for improved yields, tolerance to pests and diseases, climate change, etc. | • Several rice breeding programs with focus on breeding for drought tolerance and other stresses. The new genotypes called the ‘New Rice for Africa’ (NERICA) were resistant to major biological constraints but showed differential sensitivity to drought stress and new diseases, and had a non-aromatic characteristic which are the major concerns of the Uganda farmers. Thus, upland rice farmers realize low yield mainly due to frequent drought stress.  
• Dissemination of good agricultural practices amongst the trainers and farmers |
| **Mr. Robert Anyang**  
Chief of Party (USAID)  
FtF CPM Activity  
+ 256 (0) 776 666 018  
ranyang@ftfcpm.com | The activity focuses on strengthening the maize, bean and coffee value chains. The target beneficiaries are the farmers and agribusiness including traders, processors and exporters | Robert was interviewed as a rice expert |
| **Jeremiah Nyambinya**  
Grainpulse Ltd, + 256 (0) 702 020 003  
jnyambinya@grainpulse.co.ug | Fertilizer blending company | • Blend fertilizers specific to crops such as bean blended fertilizer |
| **Mr. M. Balikowa,**  
Nakisenhe Adult Literacy Group, Iganga District  
+ 256 (0) 782 455 783 | Membership organization with 1,000 smallholder farmers located in Iganga district.  
Deal in beans, rice and maize production and trade. Supply to UNWFP among other buyers  
Owns a warehouse | o Advisory services on good agricultural practices  
o The group provides market linkages to large buyers including UNWFP |
<table>
<thead>
<tr>
<th>Name &amp; Address</th>
<th>Overview</th>
<th>Current Activities in the Sector</th>
</tr>
</thead>
</table>
| **Eng. Geowillis Mugoya, Busowa Farmers and Traders Cooperative Society, Bugiri District**  
 + 256 (0) 772579 513 | Received support from IDB for development of an irrigation schemer for rice production (not yet operational) and stretches through Bugiri and Iganga districts. | • Currently, farmers find their own means of irrigating rice fields because the irrigation system is not constructed.  
• The association links members to service providers for training on good agricultural practices and product quality |
| **Mr. W. Ojiambo,  
+ 256 (0) 772 539 046  
Wakulima Growers’ Association, Bugiri District** | Membership organization with approximately 800 rice smallholder farmers located in Bugiri, Busia, Namayingo and Iganga districts | o Advisory services through linkage to service providers  
o Financial services: operates a loan scheme amongst the members and recovery is done at the time of commodity sale. The association is able to get a lump sum loan from Opportunity Bank, which it uses to lend to individual farmers.  
o Agro inputs on credit: the association links with seed companies and other dealers to avail inputs on credit and payment is done later in the season  
o The association has a small fund, which is used for purchasing un-milled rice from farmers. This is transported to Upland rice Millers in Jinja for milling and sold eventually. |
| **Lero Industries, Lira Municipality, Lira District** | Rice Miller | • As a mill, provides a milling service at approximately UGX 100 / kg of milled  
• The mill also buys un-milled rice from farmers;  
• The miller advances credit to farmers during crop production as a way of strengthening farmer – miller / buyer relationship  
• Milled rice is purchased by traders who usually keep at the mill |
<table>
<thead>
<tr>
<th>Name &amp; Address</th>
<th>Overview</th>
<th>Current Activities in the Sector</th>
</tr>
</thead>
</table>
| **Ms. Betty Acan, Lira ItekOkile Cooperative Society, Barr Sub County, Lira District**  
+ 256 (0) 784 268 465 | ItekOkile Irrigation Scheme with support from GoU to set-up an irrigation system (not yet operational) approximately 700 acres. | • Management of irrigation scheme; association allocates land to members at a fee of UGX 40,000 / acre. Currently, farmers find their own means of irrigating rice fields because the irrigation system is still under construction.  
• The association operates a rice mill with drying grounds, moisture meter, threshers, warehouse, etc.  
• Rice farmers have received training on good agricultural practices and product quality |
| **Abor Amos, Abor and Sons Enterprises**  
+ 256 (0) 775 818 628  
Lira Municipality, Lira District | Rice Trader | The enterprise buys rice from Lango and Teso depending on the seasons / harvest periods. Whenever there is no rice in Lango he goes to Teso to ensure that he sells rice throughout the year. He usually stocks 2 – 5 MT. |
| **Yusuf Njalira**  
+ 256 (0) 772 676 671  
Lwoba Holdings Ltd / Manafwa Basin Rice Farmers’ Cooperative Society Ltd, Himutu Sub County, Butaleja District | Irrigation Scheme with support from GoU/ UDET / JICA / Netherlands Government on approximately 1,500 acres and over 3,000 smallholder farmers | • Management of irrigation scheme by Water Users’ Association; allocates land to members at a fee of UGX 450,000 / acre / season.  
• UDET has supported with a 500MT capacity store and seed funds for the society to buy rice from the farmers within the scheme and others  
• NARO uses the farm as a research base for new varieties  
• The association operates a rice mill with drying grounds, moisture meter, threshers, warehouse, etc. |
| **Aceng Flora**  
+ 256 (0) 784 210 808  
Lira Municipality, Lira District | Rice Trader | During the peak of harvest season, Flora usually acquires a loan and stock up to 2mt but this reduces drastically when the season is almost done. Flora trades in rice milled in Lira only and switches to other commodities during off-season. |
<table>
<thead>
<tr>
<th>Name &amp; Address</th>
<th>Overview</th>
<th>Current Activities in the Sector</th>
</tr>
</thead>
</table>
| Owot Santa, + 256 (0) 779 749 489 RibeBer Rice Millers, Layibi Division, Gulu District | Rice Miller | • As a mill, provides a milling service to farmers and traders. Buy rice from farmers on credit, provide milling service and sell to traders to be able to recover the milling service fee. The farmers are then paid for milled rice.  
• The mill buys un-milled rice from farmers;  
• The miller provides training to farmers in good agricultural practices; provides packaging material and transport for rice to the mill as way of strengthening farmer – miller / buyer relationship.  
• Milled rice is purchased by traders from Gulu and other districts who usually keep at the mill or are informed of availability of rice at the mill |
| Ali Kidega, + 256 (0) 791 161 103 Pa AngaLacor Rice Millers, Bardege Division, Gulu District | Rice Miller | • As a mill, provides a milling service to farmers and traders. Buy rice from farmers on credit, provide milling service and sell to traders to be able to recover the milling service fee. The farmers are then paid for milled rice.  
• The mill buys un-milled rice from farmers;  
• The miller provides training to farmers in good agricultural practices; provides packaging material and transport for rice to the mill as way of strengthening farmer – miller / buyer relationship.  
• Milled rice is purchased by traders from Gulu and other districts who usually keep at the mill or are informed of availability of rice at the mill |
### Annex C: Stakeholders consulted, sesame

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
<th>Organization</th>
<th>Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Collins Apuoyo</td>
<td>Director, Market Development</td>
<td>Palladium-NUTEC</td>
<td>Tel: 0751820845; E-mail: <a href="mailto:Collins.Apuoyo@thepalladiumgroup.com">Collins.Apuoyo@thepalladiumgroup.com</a></td>
</tr>
<tr>
<td>Mr. David Obiro</td>
<td>Production Supervisor</td>
<td>Upland Rice Millers</td>
<td>Tel: 0776869644; Email: <a href="mailto:info@uplandrice.com">info@uplandrice.com</a></td>
</tr>
<tr>
<td>Mr. Gelenga Ben Moi</td>
<td>Operations Manager</td>
<td>Upland Rice Millers</td>
<td>Tel: 0782596208; Email: <a href="mailto:info@uplandrice.com">info@uplandrice.com</a></td>
</tr>
<tr>
<td>Amb. Phillip Idro</td>
<td>Chairperson</td>
<td>RMCU</td>
<td>Tel: 0788052803; Email <a href="mailto:idrophil@yahoo.com">idrophil@yahoo.com</a></td>
</tr>
<tr>
<td>Mr. Richard Ibengo</td>
<td>Manager</td>
<td>Agroways</td>
<td>Tel: 0782391354; <a href="mailto:richard.ibengo@agroways.ug">richard.ibengo@agroways.ug</a></td>
</tr>
<tr>
<td>Mr. Job Okello Auma</td>
<td>CEO</td>
<td>Eastern Rice</td>
<td>Tel: 0772719570; <a href="mailto:easternrice@yahoo.com">easternrice@yahoo.com</a></td>
</tr>
<tr>
<td>Mr. Venugopal Pookat</td>
<td>CEO &amp; Director</td>
<td>Tilda</td>
<td>Tel: 0772255444</td>
</tr>
<tr>
<td>Mr. Jackson Lakor</td>
<td>DAO</td>
<td>Gulu District</td>
<td>Tel: 0700404138; <a href="mailto:lakor@gmail.com">lakor@gmail.com</a></td>
</tr>
<tr>
<td>Mr. Charles Oboth</td>
<td>Chair</td>
<td>Gulu Agricultural Development Company</td>
<td>Tel: 0782/0752 458615; <a href="mailto:charlesoboth74@gmail.com">charlesoboth74@gmail.com</a></td>
</tr>
<tr>
<td>Ms. Joyce</td>
<td>Trader</td>
<td>Gulu</td>
<td>Tel: 0772947718</td>
</tr>
<tr>
<td>Mr. Ocen O.</td>
<td>Trader</td>
<td>Gulu</td>
<td>Tel: 0711975656</td>
</tr>
<tr>
<td>Ms. P. Cakamayo</td>
<td>Trader</td>
<td>Gulu</td>
<td>Tel: 0779026091</td>
</tr>
<tr>
<td>Mr. Ngomkuru K.</td>
<td>Chair</td>
<td>KOFDA</td>
<td>Tel: 0752318641</td>
</tr>
<tr>
<td>Mr. Opira J.</td>
<td>Store keeper</td>
<td>KOFDA</td>
<td>Tel: 0785540767</td>
</tr>
<tr>
<td>Mr. Okeny A.</td>
<td>Chair</td>
<td>PJFA</td>
<td>Tel: 0788734155</td>
</tr>
<tr>
<td>Mr. Okeny G.</td>
<td>Store keeper</td>
<td>PJFA</td>
<td>Tel: 0788924770</td>
</tr>
<tr>
<td>Mr. Robert Opio</td>
<td>Agricultural Officer</td>
<td>Lira District</td>
<td>Tel: 0772331800</td>
</tr>
<tr>
<td>Mr. Geoffrey Eriau</td>
<td>Proprietor/Trader</td>
<td>Lira Resort</td>
<td>Tel: 0772/0701/0752-786497</td>
</tr>
<tr>
<td>Mr. Ambrose Oluge</td>
<td>Extension Officer</td>
<td>Shares</td>
<td>Tel: 0782867949</td>
</tr>
<tr>
<td>Mr. Patrick</td>
<td>Trader</td>
<td>Lira</td>
<td>Tel: 0779036867</td>
</tr>
<tr>
<td>Mr. Paul Lubega</td>
<td>Head of DPs</td>
<td>JICA</td>
<td>Tel: 0774724120/0773253894; Email: <a href="mailto:LubegaPaul.UG@jica.go.jp">LubegaPaul.UG@jica.go.jp</a></td>
</tr>
<tr>
<td>Mr. Peter Abong</td>
<td>Coordinator, IDB Rice Project</td>
<td>MAAIF</td>
<td>Tel: 0772484071</td>
</tr>
<tr>
<td>Mr. Okaasai-Opolot</td>
<td>Director</td>
<td>MAAIF</td>
<td>Tel: 0772589642</td>
</tr>
<tr>
<td>Dr. Simon Byabagambi</td>
<td>Agronomist</td>
<td>USAID</td>
<td>Tel: 0706339317/0706339317</td>
</tr>
</tbody>
</table>
Fieldwork and Stakeholder meeting insights – Beans

Fieldwork

There is an inadequate quantity of breeder and foundation seed for bean varieties that serve a wide variety of consumer preference classes and the seed companies are reluctant to multiply and distribute premium bean seed without clear market demand. Breeders have an awareness of varieties that will serve a wide variety of consumer preference classes but the farmers are generally unaware.

There is a low awareness on the part of the farmers on the bean varieties available and therefore the low demand for bean seed which is purchased on an opportunity basis often price driven. There is a high availability of counterfeit bean seed on the market which is often branded as improved or certified but is either home produced or old which leads to poor viability and yields. Governance in the certification and validation of all agricultural inputs including seeds, fertiliser and protection chemicals is weak. Evidence from several studies show that the local traders of agrochemical inputs are unskilled or untrained and give advice based on sales potential rather than technical knowledge.

There is inadequate enforcement of the agro-input regulations to enhance trade in improved quality and varietal selections.

Weak farmers’ organizations are not able to provide services to members for improved commodity production and marketing. There is little evidence of the seed companies working with farmer groups to establish demand and then plan the production of certified seed to meet that demand.
Private sector actors such as pre-cooked beans processors have a low ability to provide off-take for farmers’ produce immediately after harvest. The lack of credit to buy the product and the adequate storage mean that farmers will sell to the first trader rather than the better or preferred trader.

**Stakeholder Meeting**

A series of discussion points were posed to the meeting with the aim of identifying and validating the CASA objectives in the Bean Value chain. Upstream discussions about farmer abilities, agro-inputs and other agronomy based subjects were recorded as important limitations but were not included in the main scope of the discussions.

• Develop market segmentation and differentiation using red and yellow beans as the lead products received a positive feedback. Beans (white/red) are being exported to Dubai and other middle east regions which confirm that premium quality can be produced.

• Take the market to the buyers in regional markets instead of the buyers coming upstream in the VC was discussed but it was felt that this should be a three to five year agenda due to the poor organisational status of the farmer groups. The discussion centred on establishing the market, establishing farmer groups that would become specialist quality producers and then looking at which actors emerged as the local and regional specialists. Afro Kai Limited, Aponye (U) Limited, Tonga (U) Limited and KAM Supplies and Contractors were mentioned as entities that could be incentivized to be early adopters.

• Increasing urbanisation and modern market requires a different product mix but the group were divided on product selection. The feedback was that the precooked products must look and taste like traditionally prepared beans to gain widespread acceptance. The advantages of less fuel and cheaper cost of preparation for rural families was broadly agreed as theoretically correct but many felt that as other products such as Maize and vegetables are cooked a long time and all day it is unlikely that the lower cooking time would be a significant driver of change in rural areas.

• Does technology have a role to inform buyers of volumes, quality, availability? The discussion group felt that farmers trust their own networks of information and attempts to inform them of pricing through radio broadcasts or SMS messages were of minimal value.

• Immediate payment to buy essential goods and in some cases more seed to plant often overrides the final price negotiated. If farmers are to be made aware of market prices and use this in negotiations then the farmer must have the ability to refuse to sell. This requires storage, credit and more reliable alternative markets that the farmer can trust.
Suitability of beans for an SME intervention program. SWOT analysis feedback from the group

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Farmers are familiar with growing the crop without new technologies</td>
<td>• Fragmented market with low opportunities for farmers to easily enter formal upstream markets</td>
</tr>
<tr>
<td>• Strong and mature public crop research program already in place</td>
<td>• Weak institutional control of all parts of the chain from inputs to quality of products</td>
</tr>
<tr>
<td>• Identified “bean corridors” emerging as focus of activity</td>
<td>• Land availability particularly to woman farmers to enter the bean value chain</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Growing market demand over a 3 – 5 year horizon as a minimum with regional and international export potential</td>
<td>• Low promotion of better technologies, varieties and a growing methodologies due to low market demand from farmers</td>
</tr>
<tr>
<td>• Adaptation to new markets for pre-cooked or branded better quality for consumers</td>
<td>• Competing crops such as Maize and Cassava where gross margins can be higher</td>
</tr>
<tr>
<td>• Opportunity for limited contract farming of bean seeds and some sort of certification of authenticity.</td>
<td>• Endemic pests such as bean weevil can wipe out crops and drive farmers out of the value chain</td>
</tr>
</tbody>
</table>

Fieldwork and Stakeholder meeting insights - Rice

Fieldwork

Inadequate quantity of rice seed on the market was frequently cited by farmers and if rice seed is available, this is low yielding and does not meet the preferences of some consumers. For example, if the rice is non-aromatic. This has perception that local rice is poor quality has favoured increased importation of rice.

From the agronomy perspective inadequate varieties that are drought, pest and disease tolerant have been bred and released for production, multiplication and dissemination but there is a lack of quantity of certified seed on the market. Agro chemicals including herbicides, insecticides and fertilisers are not readily available and are often counterfeit. Low awareness about good agricultural practices by farmers often leads to low yields and can lead then to buy cheaper but counterfeit inputs that dissuade them from investing again.

Climate change has affected rice production. There have been prolonged dry spells and some available rice varieties available cannot tolerate this phenomenon. Some farmers cited extensive crop loss due to lack of rainfall. Irrigation schemes are still under construction in many areas or are inadequate to support further expansion of crops. Therefore, watering rice fields is still a challenge for many rural farmers.
Weak farmers’ organizations are not able to provide services to members such as credit and financial guidance needs. Traders provide credit to farmers during production and the agreement is that for UGX 80,000 a farmer should pay back 100kg of milled rice. This makes farmers harvest pre-mature rice and are not able to follow the quality requirements to gain a premium product. With limited bulking facilities within the farming community there are added pressures linking to the need to pay off the trader loan. Trading in rice is not regulated and therefore farmers and traders deal in poor quality rice often in informal markets and suboptimal agreements ensue.

Poor milling technology which further reduces the quality of milled rice leads to a lack of market linkages for well milled rice. Most of the traders wish to buy un-milled rice and although buying un-milled rice is a risk, due to the eventual quality of rice being unknown, the downgrading due to poor postharvest handling is lessened. Traders factor in these risk associated costs into farmer purchase price. Some traders give loans to farmers during rice production and agree to pay back in form of rice. However, farmers cite that they are generally dissatisfied with the goods for loan repayment option and opt to sell to traders who are paying cash for the un-milled rice. Traders suggested that, as much as it is good to establish relationships with farmers especially aiding them to finance rice production, it becomes difficult to recover the loans extended.

Large traders from “Kampala” usually would want to buy in large quantities but are not able to buy stock for cash on collection due to limited finance. Thus, finance is a limiting factor in trade enhancement even for the larger companies.

Transport costs tend to be quite high especially when picking rice from the areas far from the urban centres. Lack of consolidation and uncertainty of supply prevents planning of larger collections and economies of scale emerging.

**Stakeholder Meeting**

Rice as an import substitution (circa 65,000 MT opportunity) was discussed. The rice imports are quality rice and is well marketed as a premium grade aromatic product. Much of the import from Pakistan is recorded but it was reported at the meeting that there are large volumes of informally imported rice from Tanzania that is medium quality and often unrecorded. So there is an opportunity for farmers to access both the high quality and mid quality markets of import substitution.

Growing for quality was discussed at length and it was agreed that farmers could begin with growing for volume as yields are currently less than 30% of what could be produced in Tanzania. Farmers could be incentivised by growing bigger volumes and then would be more willing to try the differentiated high quality varieties as they would not be so desperate to be paid.

Raw materials and inputs are key to production of quality products and the weakness of the institutions in respect of verification is a severe limitation. Lack of capacity is more a problem than lack of regulations.

Milling agents, particularly those operating single pass mills at village level are service providers. The millers are not invested in the VC as they do not make a profit from trading only milling. The impact of poor milling equipment is severe. How can the millers become value added actors and encouraged to invest in better equipment and services is unclear.

What skills would be required to reduce the number of micro-aggregators and upskill the remaining middlemen to add value as skilled intermediaries was discussed. The stakeholder group recognised the need to reduce the number of actors in the chain that take value from inefficiencies but felt that
the micro-aggregators and village agents are so much of the social fabric that it would be difficult to design an end-to-end model that excluded them.

**Suitability of Rice for an SME intervention program SWOT analysis feedback from the group**

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESS</th>
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<tbody>
<tr>
<td>• Market ready volumes are already good but need formalisation of channels to market</td>
<td>• Highly politicised and difficult to know who is in charge of policy</td>
</tr>
<tr>
<td>• Strong and mature public crop research program already in place with varieties and technologies</td>
<td>• Can be climate change sensitive if badly managed expansion into non suitable areas</td>
</tr>
<tr>
<td>• Well defined legal agricultural zones suitable for rice that will not be affected by climate change if well managed</td>
<td>• Promoting premium quality and export could impact food security if it raises consumer prices for standard rice</td>
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<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
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<tbody>
<tr>
<td>• DRC and South Sudan market are very strong for regional export of medium quality bulk rice</td>
<td>• Political landscape is fragmented and many actors are not looking at the bigger or longer term picture</td>
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<td>• Strong market for aromatic premium grade rice for import substitution</td>
<td>• Unmanaged expansion is a threat to biodiversity</td>
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<td>• Exporting countries like Pakistan are cutting back on export volumes and have their own internal population growth to feed.</td>
<td>• East Africa Community (common External Tariff) is a potential threat to any national rice policy because although it is a regional initiative the individual countries pursue individual agendas</td>
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<td>• Rice farmers are some of the poorest in Uganda so the impact on poverty elevation would be greater than with a premium crop.</td>
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