AGRICULTURAL VALUE CHAIN ANALYSIS IN NORTHERN UGANDA: MAIZE, RICE, GROUNDNUTS, SUNFLOWER AND SESAME

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**Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABi</td>
<td>Agribusiness Initiative</td>
</tr>
<tr>
<td>ACF</td>
<td>Action Contre la Faim</td>
</tr>
<tr>
<td>ALERP</td>
<td>Agricultural Livelihoods Recovery Program</td>
</tr>
<tr>
<td>GBV</td>
<td>Gender Based Violence</td>
</tr>
<tr>
<td>CSO</td>
<td>Civil Society Organization</td>
</tr>
<tr>
<td>FSL</td>
<td>Food Security and Livelihood</td>
</tr>
<tr>
<td>FG</td>
<td>Farmer Group</td>
</tr>
<tr>
<td>LRA</td>
<td>Lord’s Resistance Army</td>
</tr>
<tr>
<td>MAAIF</td>
<td>Ministry of Agriculture, Animal Industry and Fisheries</td>
</tr>
<tr>
<td>IDP</td>
<td>Internally Displaced Person</td>
</tr>
<tr>
<td>INGO</td>
<td>International Non-Governmental Organization</td>
</tr>
<tr>
<td>NAADS</td>
<td>National Agriculture Advisory Services</td>
</tr>
<tr>
<td>NUSAF</td>
<td>Northern Uganda Social Action Fund</td>
</tr>
<tr>
<td>P4P</td>
<td>Purchase for Progress</td>
</tr>
<tr>
<td>SPRING</td>
<td>Stability, Peace and Recovery in Northern Uganda</td>
</tr>
<tr>
<td>SWOT</td>
<td>Strength, Weaknesses, Opportunities and Threats</td>
</tr>
<tr>
<td>UBOS</td>
<td>Uganda Bureau of Statistics</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>VCA</td>
<td>Value Chain Analysis</td>
</tr>
<tr>
<td>VSLA</td>
<td>Village Savings and Loan Association</td>
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<td>WFP</td>
<td>World Food Program</td>
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Executive Summary

Introduction

This study was conducted over a three month period between October and December 2013. Five value chains were analysed: maize, rice, groundnuts, sesame and sunflower in two sub-regions (Acholi and Lango) in northern Uganda.

ACF has two distinctive projects within these regions; one is located in the Acholi region and is called Purchase for Progress (P4P) in partnership with the World Food Program (WFP), focusing on better linking farmers to the market. The other one is located in the Lango region and is a livelihood project with the Royal Norwegian Embassy, focusing on empowering vulnerable women through unconditional cash transfers.

Objectives of the study

A value chain analysis was done for each of the following five crop commodities: maize, rice, groundnuts, sunflower and sesame. This included mapping of the value chains, detailed descriptions of the main actors involved in the value chains (from farmers to end consumers) and lastly, analysis of how the value is distributed across the different actors.

Methodology

The methodology involved collection of information and documentary review of secondary literature, collection of primary information from the field through focus group discussions and semi-structured interviews using purposive sampling and specific tools (see annexes). Lastly, data was compiled and analysed to generate gross margins obtained by different actors along the value chains.

General Findings

Most farmers were smallholders cultivating a wide range of crops for household consumption and food security purposes. Part of their land is also utilized for growing crops that are later sold on the market and generate revenues for farmers. This study focuses on the latter group of crops, known as “cash crops”.

All value chains were similar particularly at the upstream stages of the chain, right after harvest. Once farmers harvested their crops, they either sold production directly at the farm gate level or stored and bulked. Selling at farm gate level was not preferred by farmers but was often done out of necessity (e.g. immediate need for cash) or simply due to very limited access to markets (e.g. no means of transportation). Farmer bargaining power was diminished and the selling prices of their crops were often very low. Another marketing strategy was often to bulk up the crop commodity either in the granary on the farm or in local stores in order to seek better prices (sold at the right time and in larger quantities).

The local traders were farmers’ first link to the market. These local traders travel to remote and difficult to access areas to collect harvests from farm gates, collection points (storage facilities) and small rural markets until they accumulate a sufficient quantity e.g. one or more truckloads. Subsequently, local traders transport the commodity to the main local markets (e.g. Gulu, Lira) where it is sold either to small shop owners for retailing, or to wholesalers who then transport it to
the main regional markets in Kampala and abroad (e.g. Kenya, South Sudan). The final market destination differs according to crop type; some of which are destined for export markets.

Crops that need secondary processing like maize, rice and sunflower have slightly different value chains. Processors have a central role to play in these value chains and are usually located in urban trading centres such as Gulu or Lira. Most of the time they serve as marketing centres where sellers and buyers meet: local traders deliver the crop and sell it directly to wholesalers while processors take a fee for processing the crop commodity. Farmers also bring their crop directly to millers and thus directly bear the transport cost.

Specific Findings

Maize

Maize is an important crop in Amuru and Nwoya, but not in Otuke. Prevailing maize prices in the area range between USh700-800 per kg although they are said to fluctuate between USh500-1,000 per kg depending on the season. If all maize output is sold, maize production can be profitable in both Amuru District (Ush536000/acre) and Nwoya District (Ush391000/acre). However, given that just 56% of total maize output is sold and that a typical maize field size is 0.39 Ha (0.975 acres), average annual household incomes obtainable from maize production are estimated to be USh582176 in Amuru and USh424684 in Nwoya¹, if maize is produced in both seasons. Grain traders, millers and flour distributors enjoy small margins of USh100-200/kg. The farm-retail spread ranges from USh350-500 per kg, showing that producers are able to capture 58-78% of the final retail price.

Rice

Rice production takes place in all visited districts. Generally, the average cost of producing rice is lower in Otuke than Amuru and Nwoya. However, yields are higher in Amuru (1,700kg/acre) and Nwoya (2,125kg/acre) than in Otuke (770kg/acre). Rice producer prices fluctuate around USh500-700 per kg for paddy and USh1500-1,800 per kg for milled rice. Rice production is generally profitable as shown by the positive margins obtained by farmers across study districts: Ush195000/acre in Amuru District; Ush330000/acre in Nwoya District; and Ush345000/acre in Otuke District. However, given that 78% of total rice output is sold and that a typical rice field size is 0.45 Ha (1.125 acres), average annual household incomes obtainable when rice is produced in both seasons are USh340470 in Amuru; USh576180 in Nwoya, and USh212140 in Otuke². Rice traders, millers and distributors have variable margins depending on services rendered with milled rice wholesalers exceeding USh1000/kg. The farm-retail spread ranges from USh1242-1310 per kg depending on the type of rice and thus, farmer’s share of final price was 29-35%.

Groundnuts

Groundnut is grown across the three study areas although the average productivity varies by district, that is, groundnut yields were higher in Nwoya and Amuru than Otuke. Producer prices are USh900000-1000000/bag of unshelled groundnuts. If all output is sold in unshelled form, groundnut production is generally profitable as shown by the positive margins obtained by farmers across study districts, that is Ush483,000/acre in Amuru District; Ush718,500/acre in Nwoya District; and Ush58,500/acre in Otuke District. However, given that 24% of total groundnut output is sold and that

¹ Maize: 228USD and 166USD, respectively
² Rice: 133USD, 225USD and 83USD, respectively
a typical groundnut field size is 0.3 Ha (0.75 acres), average annual household incomes obtainable from groundnut production are USh172432 in Amuru, USh256504 in Nwoya, and USh20884 in Otuke, if it is produced in both seasons. Groundnut traders have modest margins of up to USh600/kg due to supply scarcity. The farm-retail spread varies from USh800-1,000 per kg depending on the type of groundnuts and hence, producers are able to capture 75-79% of the final retail price.

Sunflower

Sunflower is widely grown in Otuke, but not Amuru and Nwoya. However, there is a huge potential for expansion of sunflower production to Amuru and Nwoya if marketing constraints existing there are removed. Sunflower yields ranged from 6 – 10 bags per acre while the unit price was USh1100-1300/kg. Sunflower production is profitable and stands at Ush 158,500/acre. However, given that 94% of total sunflower output is sold and that a typical sunflower field size is 1.74 acres, and assuming it is produced in both seasons, average annual household income obtainable from sunflower production is estimated to be USh16058 in Otuke. Margins are high for millers (USh514-714/kg) and sunflower oil traders (USh1,000-2,500/kg) while sunflower seed traders only receive a tiny margin of up to USh200/kg. The farm-retail spread is as high as USh1,557-1,937 per kg of sunflower seed with farmers only capturing 36-46% of the final retail price.

Sesame

Sesame production is widespread in Otuke; and there is a huge potential for its production in Amuru and Nwoya if production constraints are removed. Average sesame yields are 1 bag per acre while the unit price is USh4,500/kg. If all output is sold, sesame production is generally profitable, that is Ush122,500/acre. However, given that 38% of total sesame output is sold and that a typical sesame field size is 0.39 Ha (0.975 acres), and assuming it is produced in both seasons, average annual household income obtainable from sesame production is estimated at USh80500 in Otuke. Marketing margins increased downstream as sesame retail traders are able to make up to USh800/kg. The farm-retail spread ranges from USh1,450-1800 per kg and thus, sesame producers were able to capture 67-74% of the final retail price.

Production constraints

Farmers face great difficulty accessing seed in terms of quantity and quality due to high prices and limited availability. Seed used is usually home saved seeds from previous harvest, most of which is made up of local varieties (except hybrid sunflower seeds).

Production is also limited by a lack of capital and access to rural credit; the majority of farmers lack access to formal financial services. When farmers manage to contract a loan, the interest rates are high, around 20% per year.

There is generally poor farmer access to extension services in most of the visited areas. Although NAADS is present in the region, their staff concentrates on only selected crop enterprises leaving the rest of the crops unattended to. NGOs in the area have attempted to bridge this gap but have worked with only crops of their choice and often focus on postharvest handing and marketing aspects, leaving out production.

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3 Groundnut: 67USD, 100USD and 8USD, respectively
4 Sunflower: 202USD
5 Sesame: 31USD

x
Other factors affecting yields include: use of rudimentary tools and equipment (e.g. hand hoe); farmers’ lack of agronomic knowledge; incidence of pests, weeds, vermin and diseases. Some areas are affected by soil exhaustion; most of these lands were previously occupied and over cultivated. Weather is also a crucial issue, with rainfall patterns becoming more and more unpredictable for farmers.

**Processing constraints**

Farmers in most cases market their crops without processing it (e.g. unmilled rice) and sell it with minimal added value. Farmers lack simple processing equipment (e.g. rice miller) or direct access to milling facilities (e.g. transportation). Another problem is the absence of postharvest handling equipment to improve the quality of the product (e.g. tarpaulins for drying the harvest). And finally, farmers lack knowledge on postharvest handling and value addition.

**Marketing constraints**

The relationship between farmers and local traders tends to be characterized by a general mistrust, affecting communication and farmers’ overall knowledge about markets. Apart from farmers within the P4P project, farmers lack appropriate storage facilities and skills to manage such facility. While some crops have great potential and are well adapted to the local environment (e.g. sunflower), market channels are inexistent. Farmers find it difficult to market their crops and attract buyers. Some crop varieties are in lesser demand and subsequently lower priced on the market than others. A significant proportion of farmers in the visited areas remains unorganized and act individually in the value chain, especially in Otuke where farmer groups are not well developed. Transportation is a strategic issue in better connecting farmers to markets: because of the poor condition of roads and the high cost of transportation, farmers remain largely isolated from markets.

**Conclusions**

Rice has high potential for expansion as a cash crop in all studied areas (Amuru, Nwoya, and Otuke) since both lowland and upland rice can be grown profitably and because Uganda is a net importer of rice. However, rice production is labour intensive (especially lowland rice) and the rice market is distorted with farmers protected from outside competition.

Sunflower has high potential for expansion as a cash crop in northern Uganda, especially in Amuru and Nwoya. Sunflower production is profitable even with use of expensive seed by farmers. The market is open and there is an expanding demand for sunflower oil and cake in the region. However, the sunflower value chain is dominated by one lead firm (Mukwano) and depends on imported hybrid seeds (PAN 7033).

Maize has also a great potential for expansion as a cash crop in Amuru and Nwoya since the soil is most fertile, improved varieties (Longe 4 and 5) are available, and its production is profitable. In Otuke, the soil conditions are not suitable for its production. The maize market is open and there is an expanding demand for the crop in urban areas and the region.

Although groundnut is a food security crop, surplus production is possible if farm productivity is enhanced, especially in Otuke. Yields of groundnut in Amuru and Nwoya are currently high (between 12-15 bags/acre of unshelled groundnut) but could risk decline with time as soil gets exhausted. Improved groundnut varieties (Serenut 2 & 4; Red Beauty) are accessible by farmers except that
production is constrained by both abiotic and biotic factors. The groundnut market is open and there is demand for the crop in urban areas that is sometimes met by imports from the region.

Sesame is another food security crop grown mainly in Otuke but which has high production expansion potential in Amuru and Nwoya. Low yields (about 1 bag/acre) obtainable by farmers, perhaps because of use of local varieties, limit amount of surpluses available for sale. Despite the sesame market being open, there is ‘thin’ demand for it outside northern Uganda.

Recommendations

Increase farm productivity and production
- Encourage farmers to select and adopt improved crop varieties
- Train farmers on better agronomic practices
- Support farmers to open more land and earlier
- Develop climate change mitigation strategies (e.g. EWS, surveillance, etc.)

Improve postharvest handling and value addition
- Train farmers on value addition and strengthen postharvest handling
- Assist farmers to procure small processing equipment
- Assist farmers to procure postharvest handling equipment

Strengthen market linkages
- Provide market information
- Promote collective marketing: encouraging farmers to organize themselves as a group
- Improve relationships between farmers and traders

Support the development of a sustainable value chain financing
- Build partnerships with financial institutions
- Promote warehouse receipt system
- Strengthen VSLAs
1. INTRODUCTION

1.1. Context of the study

Ugandan’s economy is primarily agriculture-based with around 2.2 million smallholders working 2 to 3 hectares; the sector represents approximately 66% of national employment in 2009 and 22.2% of country’s GDP. The sector also contributes to most of the country’s total exports.

Like the rest of the country, agriculture is a leading economy in Northern Uganda and is imperative to offer food security; income diversification; increased national productivity as well as job creation. Typical of the farming system in Northern Uganda, most of the crops that are grown include: sesame, soybeans, groundnuts, sorghum, millet, maize, beans, pigeon peas, cassava, sweet potatoes, rice, and cow peas. All of these crops serve as both cash or food crops (Table 1).

Table 1: Important crops grown in Northern Uganda in 2008/09

<table>
<thead>
<tr>
<th>Crop</th>
<th>% hhs 1st &amp; 2nd season</th>
<th>Plot Size (Ha)</th>
<th>Total area (Ha)</th>
<th>Total production (Mt)</th>
<th>Mean yield (Mt/ha)</th>
<th>% consumed</th>
<th>% stored &amp; other</th>
<th>% sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>23.5 18.6</td>
<td>0.39</td>
<td>247,780</td>
<td>305,798</td>
<td>1.2</td>
<td>44.3</td>
<td>29.0</td>
<td>26.7</td>
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<tr>
<td>Rice</td>
<td>3.2 3.7</td>
<td>0.45</td>
<td>25,912</td>
<td>43,719</td>
<td>1.7</td>
<td>22.4</td>
<td>42.2</td>
<td>35.4</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>13.7 10.4</td>
<td>0.30</td>
<td>136,893</td>
<td>83,182</td>
<td>0.6</td>
<td>37.2</td>
<td>39.0</td>
<td>23.8</td>
</tr>
<tr>
<td>Sesame</td>
<td>0.6 2.8</td>
<td>0.39</td>
<td>158,763</td>
<td>93,562</td>
<td>0.6</td>
<td>37.1</td>
<td>29.2</td>
<td>33.7</td>
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<tr>
<td>Soybeans</td>
<td>2.9 4.3</td>
<td>0.40</td>
<td>26,195</td>
<td>15,727</td>
<td>0.6</td>
<td>10.3</td>
<td>18.6</td>
<td>71.1</td>
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<td>Finger millet</td>
<td>4.0 2.2</td>
<td>0.34</td>
<td>105,656</td>
<td>78,572</td>
<td>0.7</td>
<td>45.5</td>
<td>41.0</td>
<td>13.5</td>
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<td>Sorghum</td>
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<td>0.43</td>
<td>249,330</td>
<td>177,088</td>
<td>0.7</td>
<td>50.5</td>
<td>38.1</td>
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<td>Beans</td>
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<td>251,221</td>
<td>1.7</td>
<td>37.3</td>
<td>43.7</td>
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<td>Field peas</td>
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<td>45.4</td>
<td>43.9</td>
<td>10.7</td>
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<td>Cow peas</td>
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<td>3,429</td>
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<td>58.1</td>
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<td>12.7</td>
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<td>Pigeon peas</td>
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<td>0.51</td>
<td>28,786</td>
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<td>52.9</td>
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<td>Cassava</td>
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<td>0.27</td>
<td>269,886</td>
<td>983,124</td>
<td>3.6</td>
<td>60.3</td>
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<td>22.1</td>
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<td>S. potatoes</td>
<td>24.2 26</td>
<td>0.15</td>
<td>60,573</td>
<td>292,932</td>
<td>4.8</td>
<td>76.8</td>
<td>11.0</td>
<td>12.2</td>
</tr>
</tbody>
</table>

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Cotton used to be the major cash crop in this region but marketable food crops such as rice, soybeans, and sesame have recently gained popularity as ‘cash’ crops. There have been efforts by private companies to promote ‘new’ crops in Northern Uganda. For example, Mukwano Industries Limited has been promoting the production of sunflower for industrial use in edible vegetable oil. Although Northern Uganda has one long rainy season or unimodal type of rainfall, production of at least two crops per year is possible.

With the return of peace and stability, Northern Uganda has the capacity in terms of production resources (fertile land, diversity of crop systems, manpower, etc.). Most farmers in this region use own land, family labour and a hoe in farm production. In a recent household survey, it was found that 93% of the farmers relied solely or partially on family labour, and more than one-half (53%) of them used a hoe for land opening. Oxen used to be an important source of farm power in this region before it was devastated by Karamojong cattle rustling and civil war. In the post-war era, cattle restocking initiatives by farmers, government, and non-governmental organizations have to a certain extent increased number of oxen owned by farmers in this region. Moreover, there exist conducive agricultural policies to increase agricultural production and enhance smallholders’ livelihoods not only by ensuring household food security but also by linking farmers to sustainable and lucrative markets. However, linking farmers to markets has until now, remained a challenge.

Under the Food Security and Livelihoods (FSL) programme, ACF implements the Purchase for Progress (P4P) project with support from WFP in Northern Uganda in 2013. The aim of this project is to improve the capacity of small holder farmers and farmer groups to participate in market-driven agricultural production, thereby raising their income.

It is against this background that ACF commissioned a value chain analysis and market study in Lango and Acholi sub regions in Northern Uganda. The study looked at the potential value chains and market linkages in the agricultural sector in Lango and Acholi sub region, starting from product conception to sale in final markets. In addition, the study looked at the process of effective utilization of resources (inputs, value addition etc.) to create a competitive advantage that would provide a lower cost and better profit margin for smallholder farmers.

1.2. Objectives

The main objective of the study was to identify key promising agricultural value chains and related constraints and opportunities in Northern Uganda in order to inform future program design for ACF.

The specific objectives of the study were:

- To map the major agricultural value chains (actors, volumes, prices, linkages, policy and institutional environment) as agreed in the preparation phase
- To identify value chain systems for the above-mentioned crops and analyse the inter-linkages (interests and conflicts) among different stakeholders
- To collect agriculture produce and crop specific data in Acholi and Lango and identify requirements for inputs, investments, value addition, storage and marketing systems both the domestic and international markets

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• To identify the region’s suitability and comparative advantage in the production of these agricultural produce. Provide statistical evidence on cultivable land availability; production inputs necessary and required; handling and storage facilities availability and adequacy; processing capacities available and adequacy etc.
• To analyse the existing policies and strategies to enable small-holder farmers’ access to markets and identify and prioritize the related policy issues.
• To develop a value chain framework/system that would integrate all the identified activities and processes including primary and support services that are capable of encouraging entrepreneurs desirous in taking advantage of the numerous potentials available in the region. To identify obstacles and offer potential solutions through an intervention matrix to show the various constraints and opportunities vis-à-vis the solutions and providers of the solutions.
• To identify potential market linkages with agro-input dealers, processors and bulk buyers.
• To obtain an inventory of initiatives on market information systems in Northern Uganda and assess the effectiveness of these initiatives in empowering smallholder farmers in the market chains.

1.3. Methodology

1.3.1. Value Chain Analysis
This study followed a value chain approach (VCA). A value chain can be defined as “the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use. The chain actors who actually transact a particular product as it moves through the value chain include input (e.g. seed suppliers), farmers, traders, processors, transporters, wholesalers, retailers and final consumers”⁹.

1.3.2. Area of study
The study was conducted in Northern Uganda, and covered two districts in the Acholi subregion (Amuru and Nwoya) and one district in Lango subregion (Otuke) as shown in Figure 1 below. Besides ACF having on-going activities in these districts, these areas have high agro potential. Further, the selection of commodity value chains for inclusion in the study was based on the following criteria: importance as both food and cash crop; number of producing households; market (local and export) potential; and availability of information. Following focus group discussions with farmers and informal interviews with key stakeholders, five crop enterprises (Maize, Rice, Sunflower, Sesame, and Groundnuts) were selected for this study mainly because of their high potential as food and/or cash crops in the region (Table 2).

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⁹ Hellin, J., and Meijer, M., Guidelines for value chain analysis, 2006
Table 2: Criteria used in selection commodity value chains

<table>
<thead>
<tr>
<th>Crop</th>
<th>Number of producing households</th>
<th>Importance as food crop</th>
<th>Importance as cash crop</th>
<th>Market potential</th>
<th>Availability of information</th>
<th>TOTAL POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>XX</td>
<td>XX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>13</td>
</tr>
<tr>
<td>Rice</td>
<td>XXX</td>
<td>XX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>14</td>
</tr>
<tr>
<td>Groundnut</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td>XXX</td>
<td>XXX</td>
<td>14</td>
</tr>
<tr>
<td>Sesame</td>
<td>X</td>
<td>XXX</td>
<td>XX</td>
<td>XX</td>
<td>XXX</td>
<td>11</td>
</tr>
<tr>
<td>Sunflower</td>
<td>X</td>
<td>X</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>11</td>
</tr>
<tr>
<td>Soybeans</td>
<td>X</td>
<td>X</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td>10</td>
</tr>
<tr>
<td>Beans (local)</td>
<td>XXX</td>
<td>XXX</td>
<td>X</td>
<td>X</td>
<td>XX</td>
<td>10</td>
</tr>
<tr>
<td>Sorghum</td>
<td>XXX</td>
<td>XXX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>9</td>
</tr>
<tr>
<td>Millet</td>
<td>X</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>X</td>
<td>8</td>
</tr>
<tr>
<td>Cassava</td>
<td>XX</td>
<td>XXX</td>
<td>X</td>
<td>XX</td>
<td>XX</td>
<td>10</td>
</tr>
<tr>
<td>S. potato</td>
<td>X</td>
<td>XX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: X is importance rating

In each of the selected districts, three sub counties were purposively selected to participate in the study based on their greater involvement in selected crop production and presence of ACF. These were: Amuru (Amuru, Lamogi and Pabbo), Nwoya (Anaka, Koch Goma and Purongo), and Otuke (Olilim, Orum and Adwari) as shown in Table 3 below:

Table 3: Selected areas for study

<table>
<thead>
<tr>
<th>Subregion</th>
<th>Districts</th>
<th>Sub-counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acholi</td>
<td>Amuru</td>
<td>Pabbo, Amuru, Lamogi</td>
</tr>
<tr>
<td></td>
<td>Nwoya</td>
<td>Purongo, Anaka, Koch Goma</td>
</tr>
<tr>
<td>Lango</td>
<td>Otuke &amp; Lira</td>
<td>Olilim, Orum, Adwari</td>
</tr>
</tbody>
</table>
1.3.3. Sampling
This study followed purposive sampling methods. Districts and sub-counties visited were purposively selected. Following the value chain approach, data was collected at each node using focus group discussion (at producer level) and informal interviews (at input, processor, distributor levels). Number and distribution of informants and focus groups are summarized in the relevant sections under Methods below.

1.3.4. Data Collection Methods
The study lead worked in cooperation with local experts, including ACF staff, Districts production officers, sector experts (NAADS, private sector), farmers’ organizations, INGOs and UN agencies who were engaged in agricultural value chain and development for data collection. A combination of methods was used to collect both primary and secondary data, namely: secondary data review, focus group discussion, and informal interviews. Each of these methods is described below in detail.

Secondary data review
A preliminary documentary review was made in order to capture a better understanding of the value chains of the different crops and how the agricultural market is overall structured in Uganda. This study examined the relevant literature such as reports published on selected value chains by USAID,
MAAIF, ICRISAT, NGOs. The outcomes of these studies were used to do a preliminary mapping of the relevant value chains and helped reveal the main constraints (maize, rice, sunflower seed, sesame, groundnuts and soybean).

**Focus group discussions**

In each selected sub county, one focus group discussion comprising of minimum 10 farmers up to 70 farmers was held (see Table 4 below). Focus Group Discussions were conducted closely with ACF staff in the field. This cooperation helped organizing and facilitating the meetings with the farmers.

<table>
<thead>
<tr>
<th>Sub county</th>
<th>District</th>
<th>Date</th>
<th>Participants (number of participants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amuru</td>
<td>Lamogi</td>
<td>30/10/2013</td>
<td>Farmers (~15)</td>
</tr>
<tr>
<td></td>
<td>Amuru</td>
<td>31/10/2013</td>
<td>Farmers (~15)</td>
</tr>
<tr>
<td></td>
<td>Pabbo</td>
<td>01/11/2013</td>
<td>Farmers, NAADS coordinator (~70)</td>
</tr>
<tr>
<td>Nwoya</td>
<td>Koch Goma</td>
<td>04/11/2013</td>
<td>Farmers (~25)</td>
</tr>
<tr>
<td></td>
<td>Anaka</td>
<td>04/11/2013</td>
<td>Farmers (~15)</td>
</tr>
<tr>
<td></td>
<td>Purongo</td>
<td>05/11/2013</td>
<td>Farmers (~15)</td>
</tr>
<tr>
<td>Otuke</td>
<td>Ollim</td>
<td>07/11/2013</td>
<td>Farmers, NAADS coordinator (~20)</td>
</tr>
<tr>
<td></td>
<td>Adwari</td>
<td>08/11/2013</td>
<td>Farmers, NAADS coordinator, Sub County Chief (~20)</td>
</tr>
<tr>
<td></td>
<td>Orum</td>
<td>08/11/2013</td>
<td>Farmers, Chairman LCIII (~10)</td>
</tr>
</tbody>
</table>

**Informal interviews**

ACF staff and farmers provided crucial information on the key stakeholders within the region, the local agricultural and market environment. Informal interviews or consultations were then held with the key stakeholders in the private and public sectors (see ANNEX I). These stakeholders included other direct actors: input dealers (Victoria Seeds & agents and AgriNet in Gulu); processors (rice and maize millers in Lira and Gulu, Mukwano, Mt Meru Millers, NileAgro Industries and other small vegetable oil millers in Lira); and various types of traders including wholesalers, retailers and exporters in Lira, Gulu, and Kampala. Direct actors in the value chain were interviewed about their operations, costs and margins, upgrading and governance issues, and technical and policy constraints. Indirect actors or service providers (financial institutions, leaders of associations, government officials, and ACF) in the value chains were also interviewed. Leaders of farmers’

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associations in Lamogi, Amuru, Koch Goma, Anaka, and Purongo, sub counties were asked about the operation of their satellite collection stores. WFP warehouse in Gulu was also visited. Government officials (District production officer, NAADS Coordinators, Sub-county chiefs, and LC III Chairpersons) were interviewed about the general importance and existing support to the selected sectors. Financial institutions (Stanbic Bank, Lira) were interviewed about their involvement in the selected value chains. ACF field workers were interviewed about their activities in the region in regard to the selected value chains.

1.3.5. Data analysis
Data was collected and analysed both qualitatively and quantitatively. Qualitative analytical methods included the compilation and classification of the collected information while the quantitative analytical methods involved the use of enterprise budgets to compute gross margins.

1.3.6. Limitations of the study
The study encountered a number of difficulties along the field work. First, the large number of value chains that were to be analysed became a challenge for such a small team and on such a short period of time. Moreover, costs of crop production had to be imputed since farmers did not keep any records.

Male farmer participants in focus group discussions were prominent and the interviewer team was composed of only male; therefore the results found could be lacking a gender approach that would help better understand certain issues affecting the value chains (management of the money within the household, alcoholism, etc.).

Prices vary significantly throughout the seasons for obvious reasons (harvesting period, production, petrol prices, climate, etc.); the prices used in this study represent the prices from a specific time frame (between the 25th October and the 9th November 2013) and are susceptible to change. Nonetheless, they provide a clear understanding of how the value is distributed between the actors of the different chains.
2. POLICIES, STRATEGIES, AND PROGRAMS

2.1. Policies and Strategies

The development of agriculture in northern Uganda is guided by generic national policies that are aimed at modernizing agriculture nationwide. These policies include:

**Development Strategy and Investment Plan (DSIP):** In 2010, Government of Uganda (GoU) and the Development Partners (DPs) approved and launched the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) Development Strategy and Investment Plan (DSIP). The DSIP is aligned and anchored on the National Development Plan (NDP) as one of the drivers of growth. The DSIP is also part of a broader framework of the Comprehensive Africa Agriculture Development Program (CAADP) to which Uganda, DPs and other stakeholders including the private sector and Civil Society Organizations committed themselves by signing the CAADP Compact. Maize and rice are among the 15 strategic commodities that have been selected for prioritization in the DSIP. The choice of the above commodities has been based on the following criteria: return to investment, priority within agro-ecological zones, number of households involved, contribution to exports, poverty effect, multiplier effect, size effect, and potential future impact. For some of selected commodities under the DSIP, specific national strategies to boost production, processing and trade have already been developed, for example, rice.

**Agricultural zoning:** Under agricultural zoning strategy, Uganda has been divided into 10 agricultural zones. For each agricultural zone, depending on its comparative advantage, a few enterprises have been selected for promotion. Acholi and Lango sub regions fall under four zones: North eastern and North western savannah grasslands, Para savannah, and Kyoga plains. Groundnuts and rice are crops being promoted in these zones. This has led to the increased production of these crop commodities in Northern Uganda.

**National Agricultural Advisory Services (NAADS):** NAADS was established in 2000 to empower farmers with knowledge, information and technologies for them to commercialize their operations. In its mode of work, NAADS works with selected enterprises and farmers in northern Uganda who are categorized into three:

- **Food security farmers** – their number varies yearly depending on resource envelope provided. From each parish, selected farmers are provided with inputs, especially seeds for multiplication, for example: rice (NERICA 4), beans, groundnuts, and banana. The beneficiary

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farmers are asked to return quantity of seed received for further distribution to other farmers.

- **Market-oriented farmers** – these farmers are selected per sub-county and are few, i.e. about 18 farmers/sub-county. To qualify to be in this group, farmers must always have surpluses to sell and must be known for production of one of the enterprises e.g. rice – need to have more than 5 acres in one cultivation. Farmers determine the kind of assistance to give them e.g. improved goats, sheep, banana etc.

- **Commercializing farmers** – from each sub county, 1-2 farmers are selected based on their acreage and use of modern technologies, for instance, they should have more than 10 acres under selected enterprise and use tractors for opening land. These farmers are also provided with inputs such as improved goats, fencing material (e.g. wire). Graduation of these farmers occurs every year and they become model farmers in the sub county.

For non NAADS farmers, they also benefit from ‘Enterprise Mix’ program and only a few (about 3 per subcounty) are selected annually. These farmers deal in different enterprises, e.g. local chicken (but need to have >100 local chicken) and receive oxen, cassava stems etc.

**Farmers’ organizations:** Throughout northern Uganda, farmers have been organized by governmental and non-governmental organizations. NAADS has been at the forefront of organizing farmers although some NGOs have also preferred to work with organized farmers. Up to 52% of males and 47% of females all above 15 years belong to some farmers’ organization in the region. In each sub county, there are more than 200 farmer groups (FGs) each consisting of 15-30 farmers. Registration of new FGs is done at the sub county level. FGs offer farmers avenues for bulk marketing and to acquire new technologies, knowledge and information. Some of these FGs have come together to be registered as an association or cooperative society. The formation of Village Savings Loan Associations (VSLAs) locally known as Bolcops is also being encouraged and promoted under FGs. VSLAs have become the major source of credit to farmers since their access to commercial banks is limited.

Other generic policies governing agricultural production in Uganda Food and Nutrition Policy, National Agricultural Research Policy, National Land Use Policy, National Water Policy, National Biotechnology and Bio-safety Policy, National Policy for the Conservation and Management of Wetlands Resources. Some of the policies still in draft form include: seed policy, fertilizer policy, and agricultural finance strategy.

On the side of marketing, Uganda has continued progress towards further and greater regional integration within and between economic communities, namely: East African Community (EAC), Common Market in Eastern and Southern Africa (COMESA) and Southern Africa Development Cooperation (SADC). Among the three Regional Economic Communities (RECS), the EAC has a functioning Customs Union which entails the free movement of goods produced within the region. Moreover, EAC countries have in principle agreed to have a common currency by 2015.

Uganda has also entered into other regional trade agreements such as the New Partnership for Africa’s Development (NEPAD), Comprehensive Africa Agriculture Development Programme (CAADP).

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and the Inter-Governmental Authority on Development (IGAD). The major challenge to the full cooperation of trading blocs still lies in the multiple memberships of some countries and fear from weak economies that they will be flooded with goods from larger economies like South Africa, Kenya and Egypt.

It is important to note that being an open economy, the GoU encourages exportation of agricultural exports, such as maize and groundnuts, to regional markets and has removed non-technical barriers to trade (tariffs, quotas, and bans). However, technical barriers to trade including SPS regulations, quality and safety standards, are on the increase and Uganda has to adhere to them if it is to remain competitive in regional markets.

On the contrary, import trade of some agricultural products, such as rice, is restricted. Uganda is a net importer of rice mainly from Asian countries (Vietnam, Pakistan etc.). In a bid to protect its rice farmers, Uganda subscribes to a 75% common external tariff (CET) imposed by east African countries on imported milled rice.

2.2. Programs

**Government Development programs**: Since the return of peace and stability to Northern Uganda, government has initiated development programs, such as Peace, Recovery, and Development Program (PRDP)\(^\text{17}\). Under this program, there is a special program known as Northern Uganda Agricultural Livelihoods Recovery Program (ALREP) whose focus is on the restoration of the productive capacity of farmers, and strengthen the linkages to agricultural service provision in terms of advice, supplies, processing and access to rural finance\(^\text{18}\). Earlier on, another government program, Northern Uganda Social Action Fund (NUSAF) financed community-driven livelihood projects, such cattle restocking, among others\(^\text{19}\).

Other development programs have been initiated by NGOs, Development partners (USAID, DANIDA etc.), World Food Programme (WFP) that target the revitalization of agricultural livelihoods in northern Uganda. Under these programs, farmers have been provided with inputs, knowledge and information as well as being linked to markets. For example, WFP’s Purchase for Progress (P4P) Program, satellite collection centres/stores have been built in selected sub counties. Similar marketing infrastructure has also been provided USAID’s Stability, Peace and Recovery in Northern Uganda (SPRING) and Agribusiness Initiative (ABI) Trust programs.

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3. VALUE CHAIN ANALYSIS OF SELECTED AGRICULTURAL COMMODITIES IN NORTHERN UGANDA

3.1. Maize Value Chain Analysis

Maize was introduced in Uganda in 1861 and has since become a major part of the farming system, ranking third in importance among the main cereal crops (finger millet, sorghum, and maize) grown in the country (MAAIF, 1988). Maize has been traditionally cultivated in Uganda by small-scale farmers both as a source of food and for income generation. It is now one of the 15 strategic agricultural commodities which has been prioritized in the Development Strategy and Investment Plan (DSIP) of the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF, 2010).

Although maize has been grown for a long time in Uganda, its per capita consumption is still low compared to Kenya owing to the presence of various staple foods, such as *matooke*, millet, sorghum, cassava, sweet potato. However, domestic consumption of maize is rising due to an increase in urbanization, number of institutions, and prices of traditional staple food, such as *matooke*. Annual maize production has increased from 1,174,000 metric tons in 2001 to 2,734,000 metric tons in 2012 (UBOS, 2013). While most of the total production is consumed domestically, surplus maize is sold to regional markets, especially Kenya and South Sudan. Maize exports during the same period almost tripled in volume: from 61,603 metric tons worth about US$ 18 million in 2001 to 174,776 metric tons worth about US$ 60 million in 2012 (UBOS, 2013).

3.1.1. Production of Maize in Northern Uganda

Maize production takes place in all regions of Uganda. In the Northern region, maize is grown in various districts, such as Oyam, Lira, Gulu, Amuru, and Nwoya, mainly as a cash crop. Nonetheless, it has the lowest volume of production among all other regions with only 305,798 Mt produced from 247,780 Ha in 2008/09\(^2\). This implies that the average maize productivity in the Northern region in the same time period was 1.2 Mt/Ha, which was lower than the national average maize productivity of 2.3 Mt/Ha. However, maize productivity varies by district in the Northern region. For example, maize productivity was highest in Amuru with 2.9 Mt/Ha in 2008/09.

Generally, maize is grown in Northern Uganda in two seasons: first season (March-April) and second season (August-September). Harvesting takes place in July-August for the first season maize while for the second season maize, it is harvested in December-January. In good years, the maize crop in the first season is larger than in the second season as more area is usually put under its production in the first season.

3.1.2. Maize Value Chain Actors

A. Producers

The farmers in northern Uganda opt for the most common maize seed, “Longe 5” and “Longe 4”, Open Pollinated Varieties (OPVs) which are grown all over the country. However, in most cases farmers use home saved seeds instead of buying them, which can negatively affect the yield after

several seasons of cultivation. After the harvest, organized farmers bulk the maize in local stores that have been provided by ACF and WFP as part of the Purchase for Progress (P4P) program. As a group, farmers bulk up their maize at the collection point and then sell it to local traders which are the main buyers. As individuals, farmers sell their maize directly at the farm gate where the local traders and sometimes wholesalers come and pick it up. Another marketing channel which is used by mainly unorganized farmers is to bring the maize to local millers after covering the cost of transportation (bicycle or “boda boda”: Ush 1 000-3 000 per bag depending on the distance) and milling (around Ush 300/kg).

B. Local traders

These local traders go around the remote rural areas that are usually difficult to access and buy the maize from farmers; they either go to the local storage facilities or directly to the farmers’ gates. These traders move from collection point to another and bulk up the maize until they accumulate a sufficient amount, which usually consist in filling up the truck. Once the maize is collected, local traders bring the maize to the millers for it to be processed or sell it as grain to wholesalers.

C. Small/medium scale millers

Small millers can be found at a local level near trading centres and rural markets whereas medium scale millers are usually found in towns such as Lira and Gulu. These millers operate in the same way but at a different scale. They receive the maize grain and process it into flour for direct consumption. The processing of maize is an important stage in the chain because it adds a significant amount of value to the maize. The flour can be sold for a retail price of about Ush 1 600/kg; with a flour extraction rate of 55% (550g for 1kg of milled maize). The bran issued from the milling is then sold for animal feed at a price of about Ush 450/kg.

Processors set a fixed price for milling the maize (around Ush 300/kg) and proceed to the milling according to customers’ demands.

D. Wholesalers

Wholesalers buy and sell maize grain destined to Kampala and regional markets (Kampala, South Sudan and Kenya) where the maize will be eventually milled for final consumption.

Wholesalers either go directly to collecting points such as trading centres and storage facilities or else they pass through local traders that bring the maize directly to them in the local towns (Lira, Gulu). Once the merchandise is bulked in large quantities, they transport it straight to the main market in Kampala or export it within the region (South Sudan and Kenya).
3.1.3. Maize Value Chain Mapping

Figure 2: Maize Value Chain Mapping

3.1.4. Gross Margin Analysis

**Gross margins to maize producers**

Maize was an important crop in Amuru and Nwoya and not in Otuke. Longe 4 and 5 were the two improved maize varieties mainly grown there and hence, production data collected during farmers’ focus group discussions reflected these varieties. The average cost of producing maize in Amuru and Nwoya was almost the same. However, it should be quickly noted that the main source of labour used was family labour and so, most of the labour costs are imputed costs. For those farmers without oxen, ploughing was the most costly operation to them since it had to be done twice. Similarly, maximum maize yield reported in the two districts was 2 Mt/acre with the lowest yield being 0.8 Mt/acre. Prevailing maize prices in the area ranged between USh700-800 per kg although they were said to fluctuate between USh500-1,000 per kg depending on the season. Considering that all maize output was sold, maize production was profitable in both Amuru District; (Ush536,000/acre) and Nwoya District (Ush391,000/acre) as shown in Table 5 below.
Table 5: Gross margins obtained by improved maize farmers in Northern Uganda

<table>
<thead>
<tr>
<th>Revenue &amp; Costs</th>
<th>District</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amuru</td>
<td>Nwoya</td>
<td></td>
</tr>
<tr>
<td><strong>Revenue:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output (kg/acre)</td>
<td>1,400</td>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>Price (USh/kg)</td>
<td>800</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>1,120,000</td>
<td>980,000</td>
<td></td>
</tr>
<tr>
<td><strong>Variable Costs:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land clearing (USh/acre)</td>
<td>24,000</td>
<td>24,000</td>
<td></td>
</tr>
<tr>
<td>Ploughing (USh/acre)</td>
<td>160,000</td>
<td>160,000</td>
<td></td>
</tr>
<tr>
<td>Planting &amp; Seed (USh/acre)</td>
<td>80,000</td>
<td>80,000</td>
<td></td>
</tr>
<tr>
<td>Weeding (USh/acre)</td>
<td>80,000</td>
<td>85,000</td>
<td></td>
</tr>
<tr>
<td>Harvesting (USh/acre)</td>
<td>120,000</td>
<td>120,000</td>
<td></td>
</tr>
<tr>
<td>Post-harvest (USh/acre)</td>
<td>90,000</td>
<td>90,000</td>
<td></td>
</tr>
<tr>
<td>Bagging (USh/acre)</td>
<td>30,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total Variable Costs(USh/acre)</strong></td>
<td>584,000</td>
<td>589,000</td>
<td></td>
</tr>
<tr>
<td><strong>Gross Margin (USh/acre)</strong></td>
<td>536,000</td>
<td>391,000</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1 bag of maize = 100 kg; 1 USD = 2500 USh. All labour costs were imputed since most farmers in the area use family labour. Labour costs were not disaggregated by gender. Only gross margins were computed.

**Household income from maize production**

Because of lack of household data on maize production, household income from maize production in Amuru and Nwoya was estimated based on data from the national census of agriculture done in 2008/09. From Table 1 above, the average size of a maize field in Northern Uganda was taken to be 0.39 Ha (0.975 acres). 44.3% of the total maize output was assumed to be consumed and the rest (55.7%) sold by producing households since maize is more of a cash than food crop in the region. Given gross margins in Table 5 above, it implies that average household incomes obtainable per season from maize production are USh291,088 in Amuru and USh212,342 in Nwoya. Since maize can be grown in two seasons in a year, as shown in Table 1 above, then it is possible for households to obtain an average annual income of USh582,176 in Amuru and USh424,684 in Nwoya (Table 6).
Table 6: Average household income from improved maize production

<table>
<thead>
<tr>
<th>Gross margin &amp; Household income</th>
<th>District</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amuru</td>
<td>Nwoya</td>
<td></td>
</tr>
<tr>
<td>Gross margin (USh/acre)</td>
<td>536,000</td>
<td>391,000</td>
<td></td>
</tr>
<tr>
<td>Average size of field (acre)</td>
<td>0.975</td>
<td>0.975</td>
<td></td>
</tr>
<tr>
<td>Average % sold</td>
<td>55.7</td>
<td>55.7</td>
<td></td>
</tr>
<tr>
<td>Average household income (USh/season)</td>
<td>291,088</td>
<td>212,342</td>
<td></td>
</tr>
<tr>
<td>Average household income (USh/year)</td>
<td>582,176</td>
<td>424,684</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1 USD = 2500 USh

Gross margins to maize value chain actors

Gross margins obtained by direct actors (producers, maize traders, millers and maize flour distributors) in the maize value chain are standardized in USh/kg (Figure 3). This allows for analysis of the value-added structure or value added at each stage of the maize value chain.

Given that maize producer prices ranged from USh700-800 per kg and computed unit cost of production varies from USh417-421 per kg, then the estimated profit margins obtained by producers vary from USh279-383 per kg as shown in Figure 3 below.

Marketing margins obtained by maize traders, millers and maize flour distributors were also computed based on the price information collected during the study. From Figure 3 below, it can be seen that the gross margin accruing to maize grain traders varies from USh100-200 per kg depending on the type of maize flour. Millers get a gross margin of USh100-200 per kg and this caters for their processing costs (e.g. electricity, labour) and profits. Maize flour wholesalers earn a gross margin of USh100 per kg while retailers get USh100-200 per kg.

Lastly, the total marketing margin or farm-retail spread, which is usually taken as a measure of efficiency of a value chain, ranges from USh350-500 per kg assuming 50% rate of conversion from grain to flour and that maize bran is sold at USh500 per kg. In other words, producers are able to capture 58 – 78% of the final retail price.
Figure 3: Costs and gross margins in the maize value chain

<table>
<thead>
<tr>
<th>Producers</th>
<th>Traders</th>
<th>Millers</th>
<th>Wholesalers</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs/Prices (USh/Kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UCOP = 417-421</td>
<td>BP = 700 – 800</td>
<td>BP = 900</td>
<td>BP = 1,500 – 1,700</td>
<td>BP = 1,600 – 1,800</td>
</tr>
<tr>
<td>SP = 700 – 800</td>
<td>SP = 900</td>
<td>SP = 1,500 – 1,700</td>
<td>(Conversion rate = 0.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Gross Margins (USh/Kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>279 – 383</td>
<td>100 – 200</td>
<td>100 – 200</td>
<td>100</td>
<td>100 – 200</td>
</tr>
</tbody>
</table>

Farm-Retail Spread = USh350-500 per Kg
Proportion of final retail price captured by producers = 58% - 70%

Note: BP and SP are buying and selling prices; UCOP is unit cost of production; GM is gross margin; USh is Uganda Shilling; and 1 USD = 2500 USh
3.2. Rice Value Chain Analysis

Rice is becoming an important cash and food crop in Uganda. Between 2002 and 2012, rice production grew by 77% (from 120,000 to 212,000 tonnes), mainly due to favourable policies, the development of improved seeds and the high level of prices in the domestic market which constitute a strong incentive for farmers. The Common External Tariffs (CET) within the Eastern African Community is an agreement which allows the taxation of imported rice up to 75%. This measure was put in place in order to limit the level of importation of rice and to promote self-sufficiency in production. Moreover, rice is among the 15 strategic agricultural commodities that have been selected for prioritization in the DSIP owing to its high returns to investment and huge potential (MAAIF, 2010).

Although Uganda’s production has increased significantly, it is unable to satisfy the increasing demand from urban consumers which is closely linked with rapid urbanization and economic growth. For example, in 2013 Uganda’s broken rice imports amounted to around US$ 7 million in value\textsuperscript{21}.

3.2.1. Production of Rice in Northern Uganda

While rice is produced in almost all regions of Uganda, the Northern Region is the second largest rice producing area with 43,719 Mt produced in 2008/09 behind the Eastern Region that produced almost three times more with 128,195 Mt\textsuperscript{22} in that same period of time. The average rice productivity in northern Uganda was 1.7 Mt/Ha in the same time period given that area under production was 136,893 Ha. This was lower than the national average rice productivity of 2.5 Mt/Ha. However, rice productivity varies by district in the Northern region. For example, in Amuru that was the leading producer of rice in the region with 19,042 Mt, rice productivity stood at about 2.5 Mt/Ha.

Rice is grown in Northern Uganda in two seasons: first season (March-April) and second season (August-September). Harvesting takes place in June-July for the first season rice while for the second season maize, it is harvested in November-December. In good years, the rice crop in the second season is significantly larger than in the first season due to higher yields in the second season.

Within Northern Uganda, rice production is prominent in most of the districts including Amuru, Gulu, Nwoya, Otuke, Dokolo, where it is cultivated as the main cash crop\textsuperscript{23}.

3.2.2. Rice Value Chain Actors

A. Producers

In this study, rice producers were found almost in every visited district, though the most significant ones - those who grew rice as a main crop - were in the Amuru, Nwoya and Otuke districts: Pabbo, Amuru, Anaka, Purongo, Olibim, Orum and Adwari sub counties.

Farmers grow different varieties of rice depending on the types of soil e.g. upland or lowland, the general access to seeds and the local habits. The most common varieties grown are “Super,” “Up Land” (“Nerica”), and “Sindano”. Once the rice is harvested, it is stored in local storage facilities on the farm. In theory, farmers tend to favour milling before selling, as the processing adds substantial value to the commodity. However it is not necessarily possible, some areas do not have access to a

\textsuperscript{21} Uganda Revenue Authority, \textit{Imports 2012-2013}, 2013.
milling machine that can process large quantities. In most cases individual farmers do not have the liquidity to pay for the transportation from the farm to the miller. Also, the need for immediate cash to pay for household’s daily expenses forces farmers to sell their rice as paddy at the farm’s gate directly to local traders.

B. Local traders

The local traders play the same role as in the maize value chain; they link rice millers with farmers. They go around the inaccessible areas and collect the rice directly from farms’ gates and stores. The paddy rice which is collected is then bulked up and transported straight to the millers.

C. Millers

Millers are usually located in urban centres such as Lira and Gulu but can also be found in a few trading centres such as Pabbo (Amuru district). They operate in marketing centres where farmers, millers and traders meet and sell/buy rice. Some medium size millers can also provide additional services to farmers such as information and/or training on farming practices (planting and post-handling), they can also grant access to a form of loan (high interest rate of 100% at harvest) and can provide transportation from farm to miller. The milling fee is Ush 150 per kilo of paddy rice, and the transformation ratio from paddy into milled rice is between 65-70%. In other words, for 100kg of paddy rice you get 65-70kg of milled rice.

When the rice is milled, it is either sold to wholesalers or directly to rural retailers located in the rural markets and trading centres.

D. Wholesalers

Once the rice is milled, it is then sold to regional importers from South Sudan and Kenya or to wholesalers from urban centres such as Gulu, Lira, and Kampala. The milled rice is then sold on city markets by retailers.
3.2.3. Rice Value Chain Mapping

Figure 4: Rice Value Chain Mapping

3.2.4. Gross Margin Analysis

*Gross margins to rice producers*

Generally, the average cost of producing rice was lower in Otuke than Amuru and Nwoya. Ploughing was the most costly operation to rice farmers since it had to be done multiple times (3 times). However, some farmers owned oxen while others who did not have hired them for ploughing. Other farm operations (such as weeding and harvesting) though costly too were done by mostly family labour and hence, were imputed costs. Rice yields were higher in Amuru and Nwoya than Otuke. Considering that all output was sold as paddy, rice production was generally profitable as shown by the positive margins obtained by farmers across study districts, that is Ush195,000/acre in Amuru.
District; Ush330,000/acre in Nwoya District; and Ush121,500/acre in Otuke District (Table 7). It is important to first note that most farmers in Amuru and Nwoya sold their rice in milled form because of the presence of milling machines in these areas. In contrast, a majority of farmers in Otuke sold their rice in unmilled form or as paddy. Secondly, the dominant type of rice that was grown in Otuke was Super (low land rice) which is preferred by consumers than Kaiso, Sindano and upland rice that were grown in Amuru and Nwoya.

Table 7: Gross margins obtained by rice farmers in Northern Uganda

<table>
<thead>
<tr>
<th>Revenue &amp; Costs</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amuru</td>
</tr>
<tr>
<td>Revenue:</td>
<td></td>
</tr>
<tr>
<td>Output (kg/acre)</td>
<td>1,700</td>
</tr>
<tr>
<td>Price (USh/kg)</td>
<td>500</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>850,000</td>
</tr>
<tr>
<td>Costs:</td>
<td></td>
</tr>
<tr>
<td>Land clearing (USh/acre)</td>
<td>45,000</td>
</tr>
<tr>
<td>Ploughing (USh/acre)</td>
<td>255,000</td>
</tr>
<tr>
<td>Planting &amp; Seed (USh/acre)</td>
<td>37,500</td>
</tr>
<tr>
<td>Weeding (USh/acre)</td>
<td>62,500</td>
</tr>
<tr>
<td>Harvesting (USh/acre)</td>
<td>137,500</td>
</tr>
<tr>
<td>Post-harvest (USh/acre)</td>
<td>87,500</td>
</tr>
<tr>
<td>Bagging (USh/acre)</td>
<td>30,000</td>
</tr>
<tr>
<td>Total Variable Costs</td>
<td>655,000</td>
</tr>
<tr>
<td>Gross Margin (USh/acre)</td>
<td>195,000</td>
</tr>
</tbody>
</table>

Note: 1 bag of paddy rice = 85 kg; 1 USD = 2500 USh
Note: All labour costs were imputed since most farmers in the area use family labour. Labour costs were not disaggregated by gender. Only gross margins were computed.

Household income from rice production

In order to estimate household income from rice production, data from the Uganda Census of Agriculture, 2008/09 was used. From Table 1 above, the average size of rice field in Northern Uganda was assumed to be 0.45 Ha (1.125 acres), 22.4% of the total rice output was considered to be consumed and the rest (77.6%) sold by producing households since rice is more of a cash than food crop in the region. Considering gross margins in Table 7 above, it implies that average household incomes obtainable per season from rice production are USh170,235 in Amuru; USh288,090 in Nwoya, and USh106,070 in Otuke. From Table 1 above, rice can be grown in 2 seasons per year further implying that on average, households can obtain annual income from rice production of USh340,470 in Amuru; USh576,180 in Nwoya, and USh212,140 in Otuke.
Table 8: Average household income from rice production

<table>
<thead>
<tr>
<th>Gross margin &amp; Household income</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amuru</td>
</tr>
<tr>
<td>Gross margin (USh/acre)</td>
<td>195,000</td>
</tr>
<tr>
<td>Average size of field (acre)</td>
<td>1.125</td>
</tr>
<tr>
<td>Average % sold</td>
<td>77.6</td>
</tr>
<tr>
<td>Average household income (USh/season)</td>
<td>170,235</td>
</tr>
<tr>
<td>Average household income (USh/year)</td>
<td>340,470</td>
</tr>
</tbody>
</table>

Note: 1 USD = 2500 USh

Gross margins to rice value chain actors

Gross margins obtained by direct actors (producers, rice traders, millers and milled rice distributors) in the rice value chain are standardized in USh/kg (Figure 5). This allows for analysis of the value-added structure or value added at each stage of the rice value chain.

From Table 7 above, it is shown that rice producer prices fluctuate from USh500-700/kg of paddy while their unit costs of production varies from USh345-655 per kg. Therefore, the estimated profit margins obtained by producers vary from USh45-155 per kg depending on the type of rice produced as shown in Figure 5 below.

Marketing margins obtained by paddy rice traders, millers and milled rice distributors were also computed based on the price information collected during the study. From Figure 5 below, it can be seen that the gross margin accruing to paddy rice traders varies from USh113-364 per kg depending on the type of rice. Millers get a gross margin of USh389-455 per kg and this caters for their processing costs (e.g. electricity, labour) and profits. During the distribution of milled rice, perhaps due to the long distance to end market (Kampala), wholesalers earn a gross margin of USh800-1,100 per kg which is less than what retailers get, that is USh200-300 per kg.

Lastly, the total marketing margin or farm-retail spread, which is usually taken as a measure of efficiency of a value chain, ranges from USh1,242-1,310 per kg depending on the type of rice and assuming 67% rate of conversion from paddy to milled rice. In other words, producers are able to capture 29 – 35% of the final retail price depending on the type of rice.
### Figure 5: Costs and gross margins in the rice value chain

<table>
<thead>
<tr>
<th></th>
<th>Producers</th>
<th>Traders</th>
<th>Millers</th>
<th>Wholesalers</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs/Prices (USh/Kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UCOP = 345–655, SP = 500 - 700</td>
<td>BP = 500 - 700, SP = 550 - 750</td>
<td>BP = 550 - 750, SP = 1,500 – 1,700</td>
<td>BP = 1,500 – 1,700, SP = 2,300 – 2,800</td>
<td>BP = 2,300 – 2,800, SP = 2,600 – 3,000</td>
<td></td>
</tr>
<tr>
<td><strong>Gross Margins (USh/Kg)</strong></td>
<td>45 – 155</td>
<td>113 – 364</td>
<td>389 – 455</td>
<td>800 – 1,100</td>
<td>200 – 300</td>
</tr>
</tbody>
</table>

*Farm-Retail Spread = USh1,242–1,310 per Kg*

*Proportion of final retail price captured by producers = 29% - 35%*

**Note:** BP and SP are buying and selling prices; UCOP is unit cost of production; GM is gross margin; USh is Uganda Shilling; and 1 USD = 2500 USh
3.3. **Groundnut Value Chain Analysis**

Groundnut is an important crop, especially in the eastern and northern regions of Uganda, where it has become part of the people’s food culture. Although grown for subsistence needs, farmers are able to produce a surplus in good seasons. Between 2002 and 2012 shelled groundnuts production in Uganda grew by 99% (from 211 000 to 421 000 Mt) and that the planted area increased by 99% (from 148 000 to 295 000 Ha)\(^24\); therefore we can conclude that the increase in production can be largely attributed to increase in surface rather than an increase in yield.

3.3.1. Production of Groundnut in Northern Uganda

Most of the groundnut in Uganda is produced in the Northern and Eastern regions. In 2008/09, it was estimated that the Northern region was the leading groundnut producing region with 83,185 Mt\(^25\) which was about one-third of national production. With 136,893 Ha under production, the average groundnut productivity in northern Uganda was 0.6 Mt/Ha in the same time period. This was lower than the national average groundnut productivity of 0.7 Mt/Ha. However, groundnut productivity varies by district in the Northern region. For example, in Amuru that was the leading producer of groundnut in the region with 14,375 Mt, groundnut productivity stood at about 1.3 Mt/Ha. Groundnut is grown in Northern Uganda in two seasons: first season (March-April) and second season (August-September). Harvesting takes place in June-July for the first season groundnut while for the second season maize, it is harvested in November-December. In good years, the groundnut crop in the first season is quite larger than in the second season due to more production area and higher yields in the first season.

Groundnut is an important crop throughout the districts in the Northern Region: from the North of Lamwo to the South of Acholi sub region and all the way East to the Lango sub region. It is grown as a subsistence crop by almost all small scale farmers, and therefore it is consumed directly by the households. In good seasons, surpluses can easily be sold to the national or regional markets (Kenya, South Sudan).

During this study, groundnuts were mainly produced as a cash crop in the following sub counties: Amuru and Lamogi in Amuru District; Purongo, Koch Goma, Anaka in Nwoya District; Ollim and Orum in Otuke District

3.3.2. Groundnut Value Chain Actors

A. Farmers

Groundnuts are grown mainly by small-scale farmers, who plant on average 1.5 - 2 acres each. The most common varieties grown are “Red Beauty” and “Serenut 2 & 4”. Farmers usually sell groundnuts at farm gate or bulk in storage facilities. It is generally sold in an unshelled form to local traders although occasionally, some farmers shell it themselves and sell directly at the local trading centres to make a better profit. Some organized farmers acquired groundnut shelling machines which they rented out to members. Otherwise, low volumes of groundnuts can be hand shelled.

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\(^{24}\) FAOSTAT

Yields vary greatly across the study area, ranging from 100kg to 1.5Mt per acre. The low yields were usually found in Otuke district where the quality of the soil is poor. Poor yields have also been encountered in Pabbo and some parts of Purongo where the fertility of the soil has been exhausted by the long periods of cultivation by IDPs living in the Pabbo camps.

A. Local traders

Local traders collect the unshelled groundnuts from farms’ gates, trading centres or storage facilities and then they transport it to town markets like Gulu or Lira. Usually, after buying from the farmers, the local traders shell the groundnuts before selling to the wholesalers in town markets. They spend about USh 1 500-2 000/bag for shelling using a hand-operated device.

B. Wholesalers

The wholesalers operate from the main towns/cities, such as Gulu, Lira, and Kampala. They buy the produce from local traders, or occasionally directly from the farmers. Most of the production goes to Kampala to be sold directly to consumers as it is (sold between Ush 4 000 and 4 500/kg) or processed into paste (the butter can be sold for around Ush 7 500/kg). The regional market is also another important destination; trucks deliver groundnuts to markets in Kenya and South Sudan.

3.3.3. Groundnut Value Chain Mapping

**Figure 6: Groundnut Value Chain Mapping**

- **Consumers**
- **Urban Retailers**
- **Wholesalers**
- **Local Traders**
- **Small Farmers/Farmer Groups**
- **Rural Retailers**

- **Unshelled groundnuts**
- **Shelled groundnuts**
- **Processed groundnuts (paste)**
3.3.4. Gross Margin Analysis

Gross margins to groundnut producers

Although groundnut was a major crop grown across the three study areas, average productivity varied by district, that is, groundnut yields were higher in Nwoya and Amuru than Otuke. However, the average cost of producing groundnut was lower in Otuke than Amuru and Nwoya. The most costly operations to groundnut farmers were ploughing (done twice), planting (high cost of seed), and harvesting (uprooting and pod removal). However, some farmers own oxen and most farmers use family labour and farm-saved seeds. Considering that all output was sold in unshelled form, groundnut production was generally profitable as shown by the positive margins obtained by farmers across study districts, that is Ush483,000/acre in Amuru District; Ush718,500/acre in Nwoya District; and Ush58,500/acre in Otuke District (Table 9). It is important to first note that most farmers across study district sold their groundnut in unshelled form despite the presence of shelling machines in some of these areas. Secondly, the dominant type of groundnut that was grown in Otuke was Serenut 2 while in Amuru and Nwoya, Red Beauty and Serenut 2 & 4 were both grown.

Table 9: Gross margins obtained by groundnut farmers in Northern Uganda

<table>
<thead>
<tr>
<th>Revenue &amp; Costs</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amuru</td>
</tr>
<tr>
<td>Revenue:</td>
<td></td>
</tr>
<tr>
<td>Output (bags/acre)</td>
<td>12</td>
</tr>
<tr>
<td>Price (USh/kg)</td>
<td>90,000</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>1,080,000</td>
</tr>
<tr>
<td>Costs:</td>
<td></td>
</tr>
<tr>
<td>Land clearing (USh/acre)</td>
<td>24,000</td>
</tr>
<tr>
<td>Ploughing (USh/acre)</td>
<td>160,000</td>
</tr>
<tr>
<td>Planting &amp; Seed (USh/acre)</td>
<td>160,000</td>
</tr>
<tr>
<td>Weeding (USh/acre)</td>
<td>85,000</td>
</tr>
<tr>
<td>Harvesting (USh/acre)</td>
<td>150,000</td>
</tr>
<tr>
<td>Post-harvest (USh/acre)</td>
<td>-</td>
</tr>
<tr>
<td>Bagging (USh/acre)</td>
<td>18,000</td>
</tr>
<tr>
<td>Total Variable Costs</td>
<td>597,000</td>
</tr>
<tr>
<td>Gross Margin (USh/acre)</td>
<td>483,000</td>
</tr>
</tbody>
</table>

Note: 1 bag of groundnut = 50 kg (unshelled) or 30 kg (shelled); 1 USD = 2500 USh. All labour costs were imputed since most farmers in the area use family labour. Labour costs were not disaggregated by gender. Only gross margins were computed.

Household income from groundnut production

In order to estimate household income from groundnut production, data from the Uganda Census of Agriculture, 2008/09 was used. From Table 1 above, the average size of a groundnut field in Northern
Uganda was assumed to be 0.3 Ha (0.75 acres), 23.8% of the total groundnut output was taken to be sold and the rest (76.2%) consumed by producing households since groundnut is more of a food than cash crop in the region. This means that incomes obtainable per season from groundnut production are USh86,216 in Amuru, USh128,252 in Nwoya, and USh10,442 in Otuke. Table 1 above shows that groundnut can be grown in Northern Uganda in 2 seasons per year further implying that on average, households can obtain annual income from groundnut production of USh172,432 in Amuru; USh256,504 in Nwoya, and USh20,884 in Otuke (Table 10).

Table 10: Average household income from groundnut production

<table>
<thead>
<tr>
<th>Gross margin &amp; Household income</th>
<th>District</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amuru</td>
<td>Nwoya</td>
<td>Otuke</td>
</tr>
<tr>
<td>Gross margin (USh/acre)</td>
<td>483,000</td>
<td>718,500</td>
<td>58,500</td>
</tr>
<tr>
<td>Average size of field (acre)</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Average % sold</td>
<td>23.8</td>
<td>23.8</td>
<td>23.8</td>
</tr>
<tr>
<td>Average household income (USh/season)</td>
<td>86,216</td>
<td>128,252</td>
<td>10,442</td>
</tr>
<tr>
<td>Average household income (USh/year)</td>
<td>172,432</td>
<td>256,504</td>
<td>20,884</td>
</tr>
</tbody>
</table>

Note: 1 USD = 2500 USh

**Gross margins to groundnut value chain actors**

Gross margins obtained by direct actors (producers and traders) in the groundnut value chain are standardized in USh/kg (Figure 7). This allows for analysis of the value-added structure or value added at each stage of the groundnut value chain.

From Table 9 above, it is shown that groundnut producer prices varied from USh90,000-100,000/bag of unshelled groundnuts (or USh3,000-3,333/kg of shelled groundnut) while their unit cost of production varied from USh1,203-2,522 per kg of shelled groundnuts. Therefore, the estimated profit margins obtained by producers vary from USh478-2,130 per kg of shelled groundnut as shown in Figure 7 below.

Marketing margins obtained by traders (local, town, and city) were also computed based on the price information collected during the study. From Figure 7 below, it can be seen that the gross margin accruing to local traders varies from USh133-500/kg depending on the district. Town traders get a gross margin of USh500-600/kg depending on type of groundnut. In the end market (Kampala), wholesalers earn a gross margin of USh167-300/kg while retailers get USh500/kg. Due to drought which affected groundnut production in Uganda (including northern Uganda) in the first season of 2013, prices were generally high in the end markets. Notably, the retail prices of groundnuts in Kampala and Gulu/Lira were at par. Moreover most of the groundnuts sold in Kampala (Owino market) came from Tanzania and Malawi and it was cheaper than locally produced groundnuts, that is, USh3,800/kg as opposed to USh4,000/kg. Imported groundnuts were also found in retail markets.
in northern Uganda, particularly Gulu. However, some groundnut from northern Uganda, especially Red Beauty, deemed superior to imported types, was also being sold in Kampala (Owino market). This was brought in by city traders who travelled to northern Uganda and then bought unshelled groundnuts directly from farmers.

Lastly, the total marketing margin or farm-retail spread, which is usually taken as a measure of efficiency of a value chain, ranged from USh800-1,000 per kg depending on the type of groundnuts. In other words, producers were able to capture 75 – 79% of the final retail price depending on the type of groundnuts.

**Figure 7: Costs and gross margins in the groundnut value chain**

<table>
<thead>
<tr>
<th>Producers</th>
<th>Local Traders</th>
<th>Town Traders</th>
<th>Wholesalers</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs/Prices (USh/Kg)</td>
<td>BP = 3,000 – 3,333</td>
<td>BP = 3,200 – 3,500</td>
<td>BP = 3,000 – 3,333</td>
<td>BP = 3,300 – 3,500</td>
</tr>
<tr>
<td>UCOP = 1,203-2,522</td>
<td>SP = 3,000 – 3,333</td>
<td>SP = 3,200 – 3,500</td>
<td>SP = 3,800 – 4,000</td>
<td>SP = 3,800 – 4,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gross Margins (USh/Kg)</th>
<th>478 – 2,130</th>
<th>133 – 500</th>
<th>500 – 600</th>
<th>167-300</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm-Retail Spread = USh800-1,000 per Kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of final retail price captured by producers = 75% - 79%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** BP and SP are buying and selling prices; UCOP is unit cost of production; GM is gross margin; USh is Uganda Shilling; and 1 USD = 2500 USh
3.4. Sunflower Value Chain Analysis

The sunflower production started in 1996 due to the donors’ interventions to face the collapse of the cotton industry. Between 2002 and 2010 sunflower seed production in Uganda grew by 85% (from 124,000 to 230,000 Mt) and has fallen down to 230,000 Mt in 2012 because of poor climate; 2013 harvest is expected to reach record levels. This increase in production is widely attributed to an increase in the planted area by 85% (from 124,000 to 230,000 Ha between 2002 and 2012).26

The chain is divided into two main channels, one is made of small scale farmers that produce independently local varieties and sell them to local millers. The other chain is made of 63,000 farmers in 13 districts of Northern Uganda and are under contract with the main oil seed processor Mukwano Industries, which is a Ugandan conglomerate that controls the entire activities related to the sunflower value chain. It is important to note that the number of farmers working with Mukwano has increased significantly over the past decade from 6,000 farmers in 2002, to 27,000 in 2007 and finally 63,000 in 2013.27 Mukwano provides inputs and purchases the farmers’ production in order to offer “predictable” prices and “good seeds”.

3.4.1. Production of Sunflower in Northern Uganda

Due to sunflower’s tolerance to dry conditions, its production is mainly found in the central and northern regions of Uganda. In the Northern Region, sunflower production is concentrated mainly in Lango sub region because of the presence of processors there. For example, in Otuke District, sunflower is a common cash crop and grows very well because of the good environmental conditions and thanks to its drought resistant capacity – appealing to farmers located in a drought prone area.

In Amuru and Nwoya Districts, sunflower also grows very well, however its production is at a very small scale and mainly used for household consumption. The main constraint is the access to market which is practically non-existent: there are no buyers unless the farmers transport the seeds directly to Gulu which is far away and costly. Also, the difficulty for farmers to access quality seeds in sufficient quantity constitutes a major obstacle along with a general lack of knowledge on how to grow sunflower (when to plant, which season, etc.). In some parts like Amuru district, there are unfounded cultural beliefs that “sunflowers are responsible for killing bees and that they affect the good quality of the honey” which can be a direct disincentive for planting sunflower.

3.4.2. Sunflower Value Chain Actors

Mukwano sunflower channel

A. Farmers

Sunflower is produced by both contract and non-contract farmers. Contract farmers sell directly or through agents to the Mukwano factory in Lira. Mukwano has an informal contract (which is not written) with farmers and provides them with hybrid seeds from South Africa “PAN 7033” twice a year (once every season) at the cost of Ush 16 500/kg (two kilos of seeds are needed for one acre of planted land, which means that farmers pay Ush 33 000/acre). These seeds are paid months in advance by farmers before being delivered. Upon this, Mukwano agrees to buy the entire production from farmers at an estimated price; although it has been arranged, the price might be susceptible to

26 FAOSTAT
27 USAID, Value Chain Governance and Access to Finance, 2007
vary according the international oil market (between Ush 800 - 1200/kg). Once the sunflowers are harvested, the farmers bring the seeds to the collecting point managed by the agent; farmers do not receive any money, but will be paid once Mukwano has set the final price which can take weeks after harvest.

B. Agents

Mukwano has agents in every district, their role is to link farmers with Mukwano by providing inputs and collecting the sunflower seeds once they are harvested. These agents can also provide trainings on agronomic practices (crop rotation, post harvesting, etc.). At the time of the study, the farmers claimed they didn’t receive any form of training.

C. Processing

Sunflower seeds are processed into cooking oil or cake which is sold for animal feed. Mukwano buys the sunflower seeds at a price fluctuating between Ush 800-1200 depending on the international sunflower oil market prices. The crude oil extracted from a sunflower seed is about 32% of its total mass; this crude oil is then transported directly to Kampala to be refined. The refined oil is then ready for consumption and can then be packaged and sold on the national market at a price of Ush7,500/Litre. The cake is sold on the regional markets or exported to Switzerland.

3.4.3. SWOT Analysis of Mukwano Industries

As for now, the Mukwano has a capacity of processing 60,000 Mt each year; however it only processes 30-35,000 Mt mainly due to insufficient production. Although Mukwano has a dominant position within the value chain, the existence of an independent chain offers other marketing possibilities for farmers therefore reducing the power of the lead company. The growing sector is attracting newcomers in the sunflower business such as Mt. Meru Millers and Nile Agro, a large cotton processor. This company recently decided to process sunflower and soybean because of the growing potential within the region. Other small millers, such as A.R. Agro millers and Maharaga Millers, have also entered into competition with Mukwano.

Table 11 below presents the SWOT analysis of Mukwano marketing channel from the soybean farmers’ perspective. By selling their sunflower to Mukwano or its agents, farmers are assured of market as well as good quality seed and information as spelt by the contract they enter into with the former. However, there were complaints from some farmers about delays in payments, delivery of seed, and delivery of poor quality seed with this channel. In terms of opportunity, farmers are able to obtain higher prices for their soybean which they sell directly to Mukwano or its agents. A growing demand for sunflower by Mukwano to meet its processing capacity also presents another opportunity to farmers as well as the availability of suitable land for sunflower production. The only constraints that seem to be facing farmers using this channel are the absence of insurance mechanism against climate change impacts and any seasonal price fluctuation that might occur.
Table 11: SWOT analysis of Mukwano marketing channel

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Guaranteed end buyer</td>
<td>• Delays in delivery of seeds which can affect germination (seed germination rate decreases after 4 to 6 months)</td>
</tr>
<tr>
<td>• Access to good quality seeds and information</td>
<td>• Delays in payment for output</td>
</tr>
<tr>
<td>• Wide network of agents to buy seed from and sell output to</td>
<td>• Poor quality seed, e.g. Seeds that don’t germinate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High demand for sunflower by Mukwano</td>
<td>• No insurance available to farmers (droughts, prices)</td>
</tr>
<tr>
<td>• Higher prices obtained by farmers due to direct marketing of sunflower</td>
<td>• Seasonal fluctuations of market prices for sunflower</td>
</tr>
<tr>
<td>• Suitable land for sunflower production</td>
<td></td>
</tr>
</tbody>
</table>

**Independent sunflower channel**

A. Farmers

Farmers that go through the independent channel can either buy hybrid seeds from Mukwano or grow the local varieties which are usually home saved seeds. These local varieties have less than half the oil content of hybrids: around 15% compared with 32% for hybrid seeds. According to the informal agreement between farmers that buy hybrid seeds from Mukwano and the company itself, farmers should sell their harvest to Mukwano. However, Mukwano cannot control farmers that wish - for various reasons e.g. higher prices or the need for cash - to sell through the independent channel. After harvest, the sunflower seeds are either sold directly to local millers - which means that the farmer has to take care of the cost of transportation - or either to local traders which is the most common way.

A. Local Traders

These local traders have similar roles as the previous value chains like maize; they collect the sunflower seeds in remote areas where it is difficult to access and buy the merchandise directly at farms’ gates and stores. Once they have collected and bulked a sufficient quantity, they bring it to the local millers in Lira.

B. Local Millers

Local millers buy the sunflower seeds at a slightly higher price than Mukwano between Ush 1 100 - 1 300/kg and then they dry the seeds before processing them into cooking oil. Millers then package and sell the oil in 20L jerricans to local retailers at a price of about Ush 78,000 per jerrican, which corresponds to about Ush 3,900/litre. The cake that is produced during the processing of the oil is sold as animal feed to traders from Kampala, Kenya and Tanzania for Ush 500/kg.
C. Local Retailers

Local retailers buy the oil from the local millers and then sell it at their small shops in Lira while managing to make a small profit. They either sell the oil as a 20L jerrican or sell it in smaller bottles of 50 to 150cl.

3.4.4. Sunflower Value Chain Mapping

Figure 8: Sunflower Value Chain Mapping

3.4.5. Gross Margin Analysis

**Gross margins to sunflower producers**

Sunflower was widely grown in Otuke and not Amuru and Nwoya. However, there is a huge potential for expansion of sunflower production to Amuru and Nwoya if marketing constraints existing there are removed. The average unit cost of producing sunflower in Otuke was Ush 391,500/acre. For those farmers without oxen, ploughing was the most costly operation to sunflower farmers since it
had to be done twice. Sunflower yields ranged from 6 – 10 bags per acre while the unit price was USh 1,100/kg. Considering that all output was sold, sunflower production was profitable as shown by the positive margins obtained by farmers, on the order of Ush 158,500/acre (Table 12).

<table>
<thead>
<tr>
<th>Revenue &amp; Costs</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output (kg/acre)</td>
<td>Otuke</td>
</tr>
<tr>
<td>Price (USh/kg)</td>
<td>500</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>1,100</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>550,000</td>
</tr>
<tr>
<td>Land clearing (USh/acre)</td>
<td>-</td>
</tr>
<tr>
<td>Ploughing (USh/acre)</td>
<td>160,000</td>
</tr>
<tr>
<td>Planting &amp; Seed (USh/acre)</td>
<td>93,000</td>
</tr>
<tr>
<td>Weeding (USh/acre)</td>
<td>48,000</td>
</tr>
<tr>
<td>Harvesting (USh/acre)</td>
<td>48,000</td>
</tr>
<tr>
<td>Post-harvest (USh/acre)</td>
<td>12,500</td>
</tr>
<tr>
<td>Bagging (USh/acre)</td>
<td>10,000</td>
</tr>
<tr>
<td>Transport</td>
<td>20,000</td>
</tr>
<tr>
<td>Total Variable Costs</td>
<td>391,500</td>
</tr>
<tr>
<td>Gross Margin (USh/acre)</td>
<td>158,500</td>
</tr>
</tbody>
</table>

Note: 1 bag of sunflower = 60-65 kg; 1 USD = 2500 USh. All labour costs were imputed since most farmers in the area use family labour. Labour costs were not disaggregated by gender. Only gross margins were computed.

Household income from sunflower production
In order to estimate household income from sunflower production, household survey data from the previous study was used. In the second season of 2009, the average size of sunflower field in Northern Uganda was 1.74 acres and 93.56% of the total sunflower output was sold by producing households clearly demonstrating that sunflower is a cash crop in the region. This means that income obtainable from sunflower production in Otuke is USh258,029 per season or USh516,058 per year for those few households that grow it in both seasons. From the focus group discussion of farmers, sunflower is grown mainly in the second season.

Table 13: Average household income from sunflower production

<table>
<thead>
<tr>
<th>Gross margin &amp; Household income</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Otuke</td>
</tr>
<tr>
<td>Gross margin (USh/acre)</td>
<td>158,500</td>
</tr>
<tr>
<td>Average size of field (acre)</td>
<td>1.74</td>
</tr>
<tr>
<td>Average % sold</td>
<td>93.56</td>
</tr>
<tr>
<td>Average household income (USh/season)</td>
<td>258,029</td>
</tr>
<tr>
<td>Average household income (USh/year)</td>
<td>516,058</td>
</tr>
</tbody>
</table>

Note: 1 USD = 2500 USh

Gross margins to sunflower value chain actors

Gross margins obtained by direct actors (producers, traders, millers and sunflower oil distributors) in the sunflower value chain are standardized in USh/kg (Figure 9). This allows for analysis of the value-added structure or value added at each stage of the sunflower value chain.

From Table 9 above, it is shown that farmers sold their sunflower at USh1,100-1,300/kg while their unit costs of production varied from USh626-1,044 per kg. Therefore, the estimated gross margins obtained by sunflower producers varied from USh56-474 per kg depending on their productivity as shown in Figure 9 below.

Marketing margins obtained by sunflower traders, millers and sunflower oil distributors were also computed based on the price information collected during the study. From Figure 9 below, it can be seen that the gross margin accruing to sunflower traders varied from USh100-200 per kg depending on which miller they sold to. Apart from Mukwano which sourced sunflower directly from farmers through its agents, other millers were supplied by both farmers and traders. Considering the sunflower hybrid seed which has an oil content of 32% and that sunflower cake is sold at USh500 per kg, millers got a gross margin of USh354-554/kg of sunflower seed and this catered for their processing costs (e.g. electricity, labour) and profits. Sunflower oil wholesalers who bought it at USh78,000 - 80,000 per 20-litre jerrican (USh3,900 - 4,000/litre) earn a gross margin of USh1,000-2,100/litre while sunflower oil retailers selling it at USh7,000-7,500/litre got a margin of USh1,000-2,500 per litre.

Lastly, the total marketing margin or farm-retail spread, which is usually taken as a measure of the efficiency of a value chain, ranges from USh1,557-1,937 per kg of sunflower seed assuming 32% oil extraction rate, sunflower cake is sold at USh500 per kg, and that 1 litre of sunflower oil weighs about 0.89 kg. In other words, sunflower producers are able to capture 36 – 46% of the final retail price.
Figure 9: Costs and gross margins in the sunflower value chain

<table>
<thead>
<tr>
<th>Producers</th>
<th>Traders</th>
<th>Millers</th>
<th>Wholesalers</th>
<th>Retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs/Prices (USh/Kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UCOP = 626-1,044</td>
<td>BP = 1,100</td>
<td>BP = 1,100 – 1,300</td>
<td>BP = 3,900 – 4,000</td>
<td>BP = 5,000 – 6,000</td>
</tr>
<tr>
<td>SP = 1,100</td>
<td>SP = 1,200 – 1,300</td>
<td>SP = 3,900 – 4,000</td>
<td>SP = 5,000 – 6,000</td>
<td>SP = 7,000 – 7,500</td>
</tr>
<tr>
<td><strong>Conversion rate = 0.32</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1 litre = 0.89 kg</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gross Margins (USh/Kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56 – 474</td>
<td>100 – 200</td>
<td>514 – 714</td>
<td>1,000 – 2,100</td>
<td>1,000 – 2,500</td>
</tr>
<tr>
<td><strong>Farm-Retail Spread = USh1,557-1,937 per Kg</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proportion of final retail price captured by producers = 36% - 46%</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SUNFLOWER SEED SUNFLOWER OIL

**Note:** BP and SP are buying and selling prices; UCOP is unit cost of production; GM is gross margin; USh is Uganda Shilling; and 1 USD = 2500 USh
3.5. **Sesame Value Chain Analysis**

Uganda is the second largest producer of sesame seeds in Africa; the country has been producing it for centuries. Sesame seeds are mainly produced by small scale farmers in the North which is the main producing region. The recently improved security after a long lasting instability in northern Uganda has enabled the development of its agriculture and more specifically the production of sesame seeds which grew in volume and in value. Between 2002 and 2012 sesame seeds production in Uganda grew by 78% (from 106 000 to 188 740 Mt) while the area planted to sesame increased by 49% (from 211 000 to 315 000 Ha)\(^{29}\).

The following value chain is quite common to most of Uganda’s agricultural products: small farmers, small rural traders that start bulking up to sell to larger wholesalers which will either sell the goods to domestic processors - in order to satisfy urban consumers - or sell to the main exporters in Kampala intended for the international market.

3.5.1. **Production of Sesame in Northern Uganda**

Most of the sesame produced in Uganda comes from the northern region, that is, out of 101,027 Mt of sesame produced in 2008/09, about 93% (93,561 Mt)\(^{30}\) was from the Northern region. With 158,763 Ha under production, the average sesame productivity in northern Uganda was 0.6 Mt/Ha in the same time period. This yield was at par with the national average sesame productivity of also 0.6 Mt/Ha. Sesame is grown in Northern Uganda in two seasons: first season (March-April) and second season (August-September). Harvesting takes place in June-July for the first season groundnut while for the second season maize, it is harvested in November-December. In good years, the sesame crop in the second season is significantly larger than in the first season due to more production area and higher yields in the second season.

In the northern region, sesame is grown in almost all households as a food security crop. But, in some areas like in Koch Goma in the Nwoya district, Olilim, Adwari and Orum in the Otuke district, the production of sesame is one of the main cash crops and the high demand makes it easy to market. Although it is grown as the main cash crop, the planted area is larger but the yields are still low, i.e. below 200kg/acre.

3.5.2. **Sesame Value Chain Actors**

A. **Farmers**

Sesame producers are small scale farmers. These farmers grow sesame mainly for home consumption and increasingly for income through the marketing of surplus production. The seeds that are used are in most cases home saved seeds of local varieties. After harvest, the sesame is sold mainly to local traders, then wholesalers, they can also sell directly to local consumers.

\(^{29}\) FAOSTAT

B. Local Traders

The local traders’ role is to gather and bulk sufficient quantities of sesame. Like in all previous chain values, the local traders go into the most remote areas to collect sesame from farms’ gates, storage facilities or local trade centres. Once sesame is accumulated in a sufficient quantity, the local traders then sell the merchandise in the main trading town/city centres (Lira, Soroti and Mbale) to rural retailers and wholesalers.

C. Wholesalers

Wholesalers act as a link between the main producing centres and main regional or international markets. Wholesalers usually buy from the local traders and bulk up large quantities to transport to Kampala to be sold at a retail price of USh 5,500/kg.

3.5.3. Sesame Value Chain Mapping

Figure 10: Sesame Value Chain Mapping

3.5.4. Gross Margin Analysis

Gross margins to sesame producers

Sesame production was widespread in Otuke although there is a huge potential for its production in Amuru and Nwoya if production constraints are removed. The average unit cost of producing sesame in Otuke was Ush282,500/acre although family labour was the main source of farm labour. For those farmers without oxen, ploughing was the most costly operation to sesame farmers since it had to be
done twice. Average sesame yields was 1 bag per acre while the unit price was USh4,500/kg. Considering that all output was sold, sesame production was generally profitable as shown by the positive margins obtained by farmers, on the order of Ush122,500/acre (Table 14).

Table 14: Gross margins obtained by sesame farmers in Northern Uganda

<table>
<thead>
<tr>
<th>Revenue &amp; Costs</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Otuke</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
</tr>
<tr>
<td>Output (kg/acre)</td>
<td>90</td>
</tr>
<tr>
<td>Price (USh/kg)</td>
<td>4,500</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>405,000</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td></td>
</tr>
<tr>
<td>Land clearing (USh/acre)</td>
<td>-</td>
</tr>
<tr>
<td>Ploughing (USh/acre)</td>
<td>150,000</td>
</tr>
<tr>
<td>Planting &amp; Seed (USh/acre)</td>
<td>18,000</td>
</tr>
<tr>
<td>Weeding (USh/acre)</td>
<td>48,000</td>
</tr>
<tr>
<td>Harvesting (USh/acre)</td>
<td>40,000</td>
</tr>
<tr>
<td>Post-harvest (USh/acre)</td>
<td>25,000</td>
</tr>
<tr>
<td>Bagging (USh/acre)</td>
<td>1,500</td>
</tr>
<tr>
<td>Total Variable Costs</td>
<td>282,500</td>
</tr>
<tr>
<td>Gross Margin (USh/acre)</td>
<td>122,500</td>
</tr>
</tbody>
</table>

Note: 1 bag of sesame = 90 kg; 1 USD = 2500 USh. All labour costs were imputed since most farmers in the area use family labour. Labour costs were not disaggregated by gender. Only gross margins were computed.

**Household income from sesame production**

In order to estimate household income from sesame production, data from the Uganda Census of Agriculture, 2008/09 was used. From Table 1 above, the average size of sesame field in Northern Uganda was taken to be 0.39 Ha (0.975 acres), 33.7% of the total sesame output was assumed to be sold and the rest (66.3%) consumed by producing households since sesame is considered to be more of a food than cash crop in the region. This means that income obtainable from sesame production in Otuke is USh40,250 per season or USh80,500 per year for those few households that grow it in both seasons. From Table 1 above only 0.6% of households grow sesame in the first season compared to 2.8% in the second season.
**Table 15: Average household income from sesame production**

<table>
<thead>
<tr>
<th>Gross margin &amp; Household income</th>
<th>District</th>
<th>Otuke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross margin (USh/acre)</td>
<td></td>
<td>122,500</td>
</tr>
<tr>
<td>Average size of field (acre)</td>
<td></td>
<td>0.975</td>
</tr>
<tr>
<td>Average % sold</td>
<td></td>
<td>33.7</td>
</tr>
<tr>
<td>Average household income (USh/season)</td>
<td></td>
<td>40,250</td>
</tr>
<tr>
<td>Average household income (USh/year)</td>
<td></td>
<td>80,500</td>
</tr>
</tbody>
</table>

**Note:** 1 USD = 2500 USh

**Gross margins to sesame value chain actors**

From Table 8 above, it is shown that sesame producer prices ranged from USh4,000-4,500/kg while their unit costs of production were USh3,139 per kg. Therefore, the estimated profit margins obtained by producers vary from USh861 - 1,361 per kg depending on the output as shown in Figure 11 below.

Marketing margins obtained by sesame traders were also computed based on the price information collected during the study. From Figure 11 below, it can be seen that the gross margin accruing to local traders varied from USh50-100/kg while town traders earned USh100-400/kg. City traders taking sesame from Gulu/Lira to Kampala sold it at a wholesale price of USh4700-4800/kg and obtained a margin of USh500-700/kg. The retail price for sesame in Kampala stood at USh5,500/kg translating into a gross margin of USh700-800/kg at this stage of the value chain.

Therefore, the total marketing margin or farm-retail spread, which is usually taken as a measure of efficiency of a value chain, ranged from USh1,450-1800 per kg. In other words, sesame producers were able to capture 67 – 74% of the final retail price.
Figure 11: Costs and gross margins in the sesame value chain

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<thead>
<tr>
<th></th>
<th>Producers</th>
<th>Local Traders</th>
<th>Town Traders</th>
<th>Wholesalers</th>
<th>Retailers</th>
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<tr>
<td>Costs/Prices (USh/Kg)</td>
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<td>UCOP</td>
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<td>SP = 3,700 - 4,050</td>
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<td>SP = 5,500</td>
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<td>Gross Margins (USh/Kg)</td>
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<td>700 – 800</td>
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</table>

Farm-Retail Spread = USh1,450-1,800 per Kg

Proportion of final retail price captured by producers = 67% - 74%

Note: BP and SP are buying and selling prices; UCOP is unit cost of production; GM is gross margin; USh is Uganda Shilling; and 1 USD = 2500 USh
3.6. Constraints to Value Chain Development

Across the studied value chains and districts, there were common constraints or rather problems farmers raised or experienced. They are systematically discussed at each stage of the value chain as shown below:

3.6.1. Production constraints

- **High price of seed**: Most farmers use home saved seeds from previous harvests; these seeds can be local varieties (sesame) or improved varieties (maize Longe 5). Although, there are existing input suppliers (Mukwano, seed companies and agents), the high prices make it difficult for farmers to have access to improved seeds, especially sunflower and groundnuts.

- **Poor quality seed**: The quality of the seeds is difficult to determine because there is very little control over it. Counterfeiting and “selling grains as seeds” is a common practice which negatively affects the quality of the seeds and therefore the yield.

- **Low availability of seed**: Some seeds can be difficult to find because they are only available in low quantities (e.g. sunflower in Nwoya and Amuru districts). Another issue is the delayed distribution of seeds (by the NAADS program or by Mukwano Industries) which delays the planting of crops according to the seasonal calendar.

- **Use of rudimentary tools**: Most farmers use rudimentary tools to work their land; however the high prices make them very difficult to access. The lack of access to farm equipment (e.g. ox ploughs) or farm power (e.g. oxen) is an important constraint to cultivate or open land. This lack of access and availability has also repercussions on the timing of weeding, planting or harvesting which can be delayed according to the seasonal calendar.

- **Poor access to extension services**: Although NAADS is present in the region, their staff concentrate on only selected crop enterprises (i.e. rice and groundnuts) leaving the rest of the crops unattended to. Although NGOs working in the area have attempted to bridge this gap, they too work with only crops of their choice and often, focus on postharvest handling and marketing leaving out production.

- **Poor access to credit**: One of the major problems that smallholders face is that the majority of them do not have access to credit from commercial banks. The main reason being that they are not credit worthy and lack collateral.

- **Limited adoption of modern agricultural practices**: Traditional agricultural practices by farmers are common in every district visited and can be attributed to a general lack of agronomic knowledge on soil preparation, pest handling, and planting (e.g. row planting) to mention but a few.

- **Pests, weeds, vermin and diseases**: These biotic factors severely impact the final yields. Farmers have a lack of technical knowledge on how to deal with pests and diseases and, can be particularly destructive, for example Striga on rice; rice blast; groundnut rosette virus. Vermin (birds, monkeys, and game) were also destructive, particularly in Nwoya which was bordering Paraa National Game Park.

- **Soil exhaustion**: This wasn’t a problem in Amuru and Nwoya except in areas that hosted the previous IDP camps (e.g. Pabbo Sub County) and which have been cultivated for many years. However, the loss of soil fertility was prevalent in Otuke. According to a farmer in Adwari “[rice] yields are increasingly higher during the 2nd, 3rd, and 4th cultivation but drop from 5th cultivation onwards due to soil exhaustion”.

40
3.6.2. Processing constraints

- **Limited access to processing machines:** Most farmers do not have access to processing machines or grain mills because of the high cost, thus forcing them to sell their merchandise unprocessed at very low prices. For example, farmers in Otuke sell rice in paddy form due to lack of rice mills there.

- **Lack of simple processing equipment:** When farmers manage to process their own crop, they add significant value to their product and therefore can sell it at a higher price and in the end increase their revenues as well as their bargaining power. However, farmers lack simple processing equipment, such as groundnut shellers, maize shellers, and groundnut paste makers.

- **Poor knowledge on postharvest handling and value addition:** Farmers do not quite well know the economics of selling processed versus unprocessed products, for example, unshelled and shelled groundnuts; paddy and milled rice.

- **Lack of postharvest handling equipment:** Farmers lacked proper postharvest handling equipment for their produce, such as solar driers, tarpaulins for drying, gunny bags, wire cribs, and even traditional granaries. This often led to production of poor quality produce that fetched low prices on the market, for example, traders blamed farmers for ‘mixing’ sand with sesame.

3.6.3. Marketing constraints

- **Lack of appropriate storage facility:** These facilities enable farmers to bulk and store their harvest in order to sell in larger quantities and when prices are more attractive, thus increasing farmer’s bargaining power. Although this is an ideal objective, it is rather difficult to ensure the storage facility is put to proper use, farmers have day to day needs which can force them to sell at the farm gate level right after harvest when prices are the lowest.

- **Poor market orientation of farmers:** Farmers often sell their crop immediately after harvest without seeking to make the best possible profit (at the best time or best price).

- **Farmers have a strong mistrust towards buyers:** Farmers think traders, especially local traders, often cheat them through use fake weights and measurements. This applies to all selected crop commodities since they are sold mainly in unstandardized bags.

- **Low market opportunities:** Some varieties of crops were inferior to other on the market. for example, Super commanded a premium price than other rice varieties (upland and Sindani); for groundnuts, *Red Beauty* was highly demanded and priced than *Serenuts*.

- **Poor market information:** Although farmers in Amuru and Nwoya have access to market information disseminated by AgriNet, they need to know how to analyse it to their own advantage. In Otuke, there was no such market information service provider.

- **Poor capacity building of FOs:** FOs are still low in capacity to bulk, process, add value, and sell together. Even though some FOs have acquired stores they are still being underutilized and, thereby raising sustainability issues.

- **High marketing costs:** Due to the poor conditions of roads and the lack of access to means of transportation, it is costly and time consuming for farmers to market their produce. For example, rice farmers in Otuke find it expensive to bring paddy to Lira or Soroti for milling before selling. Similarly, sunflower farmers in Amuru and Nwoya were far away from Lira where the buyers/processors are located.
3.7. Cross-cutting issues

In all the studied value chains, the following cross-cutting issues were identified: lack of capital; poor and limited access to rural credit; poor infrastructure; lack of market information; gender issues; and climate change. Each of these issues is systematically discussed below.

3.7.1. Lack of capital

Small farmers are poor and lack sufficient capital in order to make medium to long term investments (a bull can cost up Ush700,000 and an ox plough can cost up to Ush250,000; need four (4) bulls to pull a plough). Most farmers have an immediate need for cash to meet their basic needs (buying food, paying for school, buying clothes, etc.) which cannot coincide with the requirements of the agricultural sector. Indeed, agriculture requires medium or long term investments by definition; it is a bet on the future. There is a large time gap between the initial investments and the expected results, between the moment when the seeds are put into the ground and the moment when they are harvested and sold. Farmers are constantly making long term choices and planning while at the same time confronted with immediate needs, thus making it difficult to establish long term strategies to better access the market.

3.7.2. Poor and limited access to rural credit

One of the major problems that smallholders face is that the majority of them do not have access to credit from commercial banks, the main reason being that most of them are not viable and lack collateral. In Northern Uganda a lot of farmers are not members of farmers’ association, although the situation is improving due to the work of NGOs and government’s favourable policies towards farmers’ associations.

Generally speaking, a majority of smallholders in Northern Uganda do not have access to any kind of loan from financial institutions. Among all the farmers interviewed during this study in Amuru, Nwoya and Otuke, a very small number had access to financial institutions, such as the Centenary Bank. The ones who had access were located in Lamogi (18 farmers out of 484 members) and the loans they contracted were individual loans linked to their property with high interest rates (21% for 6 months). To contract a loan, farmers must be able to link their property as a guaranty for the bank in case of non-payment. This first step can be an important obstacle since the land can be linked to multiple owners; also, ownership can be differentiated with the rights over the land such as the right to sell the land for example. The process of selling land can be complicated and involve many stakeholders e.g. community, local chiefs and members of the family. Furthermore, most farmers do not own property certificates or land titles for that matter.

Loans are granted according to the farmer’s nature and scale of operation, the crops that are cultivated, area, yields, etc. Therefore many farmers are not considered viable by financial institutions as they do not fulfil the minimum requirements of making sufficient profit.

When seeking for liquidity, farmers usually have access to Village Savings Loan Associations (VSLAs), locally known as Bolcops, which are usually constituted of 30 to 40 members that each pays a monthly fee. The association then agrees or not agrees to grant a loan to the demander and, this loan cannot exceed 200% of the demander’s contribution.
Another form of loan is to informally borrow from neighbouring farmers or local millers at very high rates of 100% per season, which corresponds to 6 months, e.g. if a farmer borrows 1 bag of rice or its value in money, at the end of the season after the harvest he will have to reimburse 2 bags of rice. In case of a bad season, repayment is deferred to the next season. The rates and the time frame can fluctuate according to the relationship, the geography, the climate, etc.

3.7.3. Poor infrastructure
The poor condition of roads in Uganda increases transportation costs, resulting in lower returns for farmers and higher prices for consumers. The cost of transportation is a major issue and especially in isolated areas where farmers simply do not have access to the markets or local millers and are forced to sell their commodities at the farm’s gate level without any added value (paddy rice vs. milled rice). This situation can hinder the bargaining power of producers whom are dependent, as they wait for buyers to come to them.

3.7.4. Lack of market information
The access to market information can be described as being generally poor. In fact, most farmers receive their information on prices through the local informal network: other farmers, local market and word of mouth. The farmers within the P4P program have access to information through AgriNet which provides weekly updates on prices in the neighbouring markets (Lira, Gulu, Kitgum, etc.). These prices are then written on white boards throughout the districts usually in trading centres or in the local storage facilities. This information is considered useful by farmers, but unfortunately having access to this information does not necessarily imply they can sell their produce at the best price since farmers have limited access to markets in terms of means of transportation. So, even if the prices are better in some areas, farmers cannot benefit from it. The extent to which this information on prices helps farmers make better decisions or have a stronger bargaining power when it comes to selling has still to be verified.

Other ways of getting information include local radios (e.g. Radio Mega in Gulu) which air specific programs about agriculture and market prices, such as “Lobo pa Pur”, literally translated as “The Farming World”. Publicity and communication by agribusiness was also another source of market information for farmers, for example, Nile Agro announced that they were buying sunflower seeds and soybean next season. Some farmers that have cellular phones can have access to market information services through text messages e.g. AgriNet.

3.7.5. Gender issues
Although this study didn’t focus on gender issues, it must be considered as a crucial matter since it leads to understanding of how decisions are taken within each household between male and female regarding production, post-harvest and marketing of crops. While production of crops is done by both genders, postharvest operations normally fall on the shoulders of women, while men market the crop and subsequently dictate how revenues are spent. According to anecdotal reports, crop revenues are sometimes misused by irresponsible men who indulge in alcoholism, polygamy, etc.

Alcoholism is common and strongly affects households and mostly men. Abusive alcohol consumption can lead to violence and aggressive behaviours, but it can also affect the productivity of farmers in terms of labour and capital, when an important amount of the household’s expenditures
are channelled into alcohol consumption. This affects the capacity for the household to meet its basic needs e.g. food, medicine or clothing, or to invest in productive capital e.g. tools, oxen, seeds, etc.

3.7.6. Climate change
Weather unpredictability is a major uncertainty for farmers since drought and floods can have a devastating impact on agricultural production. Yet, the Northern Region seems to be more and more prone to these natural disasters due to climate change impacts, that is: drought, flooding etc. Changes in rainfall patterns over the years have been disturbing farmers increasingly; the consequence of this is that it becomes unpredictable for farmers to know when the next cropping season begins and whether or not they should start planting. Recurrent drought as it last happened in the first season of 2013 leads to colossal or total loss of crops. Heavy and extended rains have also hindered harvesting and postharvest processing of certain crops, such as cereals and legumes. At times, flooding has caused complete loss of some crops, such as groundnuts and cassava.
4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

The following conclusions can be drawn from this study:

- Production of studied crops (maize, rice, groundnuts, sunflower, and sesame) is done mainly by smallholder farmers with minimal use of modern production practices and technologies. Rice, sunflower, and to some extent maize are grown as cash crops in northern Uganda. Groundnuts and sesame are grown for food and only surpluses are sold.

- Rice has a great potential for expansion as a cash crop in all studied areas (Amuru, Nwoya, and Otuke) since both lowland and upland rice can be grown profitably and, Uganda is a net importer of rice. However, rice production is labour intensive (especially lowland rice) and the rice market is distorted with farmers being protected from outside competition.

- Sunflower has a great potential for expansion as a cash crop in northern Uganda, especially in Amuru and Nwoya. Sunflower production is profitable even with use of expensive seed by farmers. The market is open and there is an expanding demand for sunflower oil and cake in the region. However, the sunflower value chain is dominated by one lead firm (Mukwano) and depends on imported hybrid seeds (PAN 7033).

- Maize has also a great potential for expansion as a cash crop in Amuru and Nwoya since the soil is most fertile, improved varieties (Longe 4 and 5) are available, and its production is profitable. In Otuke, the soil conditions are not suitable for its production. The maize market is open and there is an expanding demand for it in urban areas and the region.

- Although groundnut is a food security crop, surplus production is possible if farm productivity is enhanced, especially in Otuke. Yields of groundnuts in Amuru and Nwoya are currently higher (between 12-15 bags/acre of unshelled groundnut) but, could decline with time as soil gets exhausted. Improved groundnut varieties (Serenut 2 & 4; Red Beauty) are accessible by farmers except that production is constrained by both abiotic and biotic factors. The groundnut market is open and there is demand for it in urban areas that is sometimes filled by imports from the region.

- Sesame is another food security crop grown mainly in Otuke but, has high production expansion potential in Amuru and Nwoya. Low yields (about 1 bag/acre) obtainable by farmers, perhaps because of use of local varieties, limit amount of surpluses available for sale. Despite the sesame market being open, there is ‘thin’ demand for it outside northern Uganda.
4.2. Recommendations

4.2.1. Increase productivity and production

- **Selection of crops and varieties:** better linking production with market demand can help farmers increase their revenues. For example, varieties of beans such as “bam” are one of the major cash crops for farmers in the Amuru and Nwoya districts; however the demand for this local variety is very limited and cannot be sold in the major markets such as Kampala where consumers prefer other varieties such as K131, Yellow bean, etc.

  E.g. Sunflower and soybean production could be developed in certain areas that do not have access to markets through the facilitation of a partnership between farmers and the main processing companies (Mukwano, Mt Meru, etc.), this could possibly lead to a better access to seeds, an increase in yield, and the guarantee to market the product. However this possibility should be further studied and constraints should be considered (cf. SWOT analysis of Mukwano).

- **Training of farmers on good agronomic practices:** soil and water management, spacing seeds, crop rotation, pest and disease control, etc.

- **Support farmers to open up more land and earlier in the season:** one of the main limiting factors of production is the opening of land; this requires specific equipment and manpower which both can be very expensive for farmers (hiring daily workers, access to ox plough, oxen, panga, ox weeders, etc.).

- **Mitigation strategies on climate change:** farmers are more and more affected by climate change; specific Disaster and Risk Management (DRM) projects could be implemented to help them become more resilient to stresses and future shocks: planting of drought resistant varieties, developing indicators for early warning systems and surveillance, etc.

4.2.2. Post-harvest handling & value addition

- **Training on value addition and strengthen post-harvest handling:** the objective of this training is to improve the overall quality of harvests (better drying, clean grains, etc.) and to sensitize farmers on value addition.

- **Small processing equipment:** primary processing equipment and appropriate technology (groundnut shellers, groundnut paste makers, rice millers, etc.) could add significant added value to the farmers’ productions and therefore increase their revenues and bargaining power.

- **Equipment for post-harvest handling:** the lack of equipment during the post-handling of commodities can be a limiting factor on quality (e.g. tarpaulins, storage facilities)

4.2.3. Strengthen market linkages

- **Provision of market information:** information is crucial to strengthen the bargaining power of farmers, and to help them make the right decisions when it comes to selling their product (at the right time and the right price). Agrinet is a good source of information for farmers and should be scaled up and also

- **Promote collective marketing:** farmers have access to better markets and better prices when they work in numbers, as part of Farmers’ Group. If farmers work as individuals, sensitizing and encouraging farmers to group can have a positive impact and better ling them
to markets (bulking, attracting new buyers, better prices, etc.). When farmers are in groups, capacity building of FGs is essential to ensure a sustainable and autonomous development and management.

- **Improve relationship between farmers and local traders**: this is generally characterized by a strong feeling of mistrust. Organizing focus group discussions could improve communication and dialogue thus reinforcing the trust between stakeholders. The goal is to improve the understanding of both parties on the structure of the whole chain and what are the main priorities of each actor.

4.2.4. Support the development of sustainable value chain financing
- **Building partnerships**: with financial institutions for example, in order to facilitate farmers’ access to credit.
- **Promote warehouse receipt system**: develop in collaboration with WFP, Uganda Commodity Exchange, financial institutions or traders, a system that would enable farmers to store their commodity in the warehouse in exchange of a receipt, allowing them to use their commodity as a collateral to access credit loans.
- **Strengthening VSLAs** through the training of FGs on better management of finance and investments. Managing a loan and using money for a productive investment can be challenging when factors such as gender related issues like GBV or alcoholism come into play.

4.2.5. Advocacy
- The economy of Uganda is characterized by a free market policy where the state’s intervention is at its minimum. Most farmers do not benefit from any kind of support from the government (financial support, market regulation, etc.), the allocated budget for agriculture isn’t more than 3 to 5% of the state’s total budget.
5. BIBLIOGRAPHY


FAOSTAT.


GIEWS.


Ministry of Agriculture Animal Industry and Fisheries (MAAIF), Agriculture Sector Performance 2011-12.


Uganda Revenue Authority, Imports 2012-2013, 2013.


# 6. ANNEXES

## ANNEX 1: List of Contact Persons

### Kampala

1. Mr. Kiaga J.  
   Trader  
   0753805199/0782576613

2. Mrs. Waswa  
   Trader  
   0752485216

### Gulu

3. Mr. Robert Dikua  
   Program Manager FSL, ACF  
   0779344547

4. Mr. Opio F.  
   Network Manager, AgriNet  
   0773990154

5. Mr. Ogwok E.  
   Extension Officer, Victoria Seeds  
   0775424071

6. Ms. Joyce  
   Produce Trader  
   0772947718

7. Mr. A. Okwany  
   Pe Yero Millers  
   0773119546

8. Mr. A. Okello  
   Pe Yero Millers  
   0779939909

9. Ms. L Auma Okello  
   WFP Warehouse  
   0772672236

10. Mr. Opit  
    Rice/Maize Miller  
    0772906327

### Lamogi Sub-county, Amuru District

11. Mr. Okoya D.  
    Secretary  
    0756364219

12. Mr. Arach M.  
    Treasurer, Prod. & marketing committe  
    0751174330

13. Mr. Omona C.  
    Driver Tricycle  
    075161989

14. Mr. Akena C.  
    Store keeper  
    0750560411

15. Mr. Oyella G.  
    C/person  
    0789057031

16. Mr. Lukweli S.  
    Overall chair  
    0718927310/0752927310

### Amuru Sub-county, Amuru District

17. Mr. Otika S.  
    Member  
    0754097533/0788202479

18. Mr. Kidega N.  
    C/ Prod and marketing committe  
    0778944679/0755023725

19. Mr. Olaro D.  
    Store keeper  
    07789321729

20. Mr. Okwara V.  
    Secretary  
    0779752780/0718925046

21. Mr. Okwara D.  
    Member  
    0789321765

22. Mr. Onen C.  
    Manager Pur Ber Farmers’ House  
    0783201593/0717588684

23. Mr. Obina G.  
    District Production Officer  
    0789815595

### Pabbo Sub-county, Amuru District

24. Mr. Komakech S.P.  
    NAADS Coordinator  
    0782635203/0713069668

25. Mr. Komakech M.K.  
    S/C Chief  
    0772685229

26. Mr. Opio D.A.  
    Chair  
    0716070777/0787070777

27. Mr. Alanyo S.  
    NAADS Service provider (crop)  
    0715223822

28. Mr. Tabu R.  
    CB Facilitator  
    0773163471

29. Hon. Nyero  
    LC 2 Councillor  
    0788950296

30. Hon Ojera A.  
    LC 2 Chair  
    0784764644

31. Mr. Opira D.  
    Rice Miller  
    0717795149

### Koch Goma Sub-county, Nwoya District

32. Mr. Ngomkuru K.  
    Chair, KOFDA  
    0752318641

33. Mr. Opira J.  
    Store keeper  
    0785540767
Anaka Sub-county, Nwoya District
34. Mr. .................... Chair, ANAPMA 0774460543
35. Mr. .................... Store keeper 0793892234

Purongo Sub-county, Nwoya District
36. Mr. Okeny A. Chair, PJFA 0788734155
37. Mr. Okeny G. Store keeper 0788924770

Lira
38. Mr. Patrick Produce Trader 0779036867
39. Mr. Eriau G Produce Trader 0772/0701/0752-786497
40. Mr. M. Enon Produce Trader 0782653978
41. Mr. R. Edwin Operations Manager, Mukwano 0772744721
42. Ms. A. Eyotaru Mt Meru Millers 0774429050
43. Mr. .............. NileAgro
44. Mr............... Stanbic Bank
45. Mr. A.Iqbal A.R. Agromillers 0772409953
46. Mr. Singh Maharaga Millers 0772604546/664848
47. Mr. A. Ocena New Exodus Millers 0772442612
48. Mr. F.Ngole Meg Wa Millers 077479951
49. Mr. G. Oduk, Meg Wa Millers 0773286308

Oiliim Sub-county, Otuke District
50. Mr. Ogwang B. NAADS Coordinator

Adwari Sub-county, Otuke District
51. Mr. Ogwang J.B. S/C Chief 0750359471

Orum Sub-county, Otuke District
52. Mr. Okulu B. LCIII Chair 0785968957
53. Mr. Alori J. Farmers Rep. 0752569004
ANNEX 2: Interview guide for producers/farmers

1. What are the main crops grown in this area? Which one of them are food/cash crops?
2. What is the trend in production of these crops and how can it be explained?
3. What are the smallest, average and the largest farmers for these crops?
4. How do you obtain inputs you use in production of these crops? (probe land, labour, seed, machinery/ox-ploughs/hoes, chemicals/drugs, fertilizers, extension services)
5. Which crop varieties are being grown here? Does anyone of them outperform the others? (Probe yields, pest & disease resistance, consumption attributes etc.)
6. Do you produce these crops individually or collectively and why? (Probe acreage for block farms)
7. Do you follow recommended agronomic practices in the production of these crops? Why or why not? (Probe seed selection, row planting, crop rotation, pest and disease control, manuring/fertilizing etc.)
8. What postharvest technologies are commonly practiced in regard to these crops? What are their advantages and disadvantages? (Probe drying and storage facilities used)
9. What is the economics of production of these crops?
10. Cost of production of selected crops

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11. What are key constraints to producing these crops?
12. In case there is any natural disaster in your area, what control measures do you always take to minimize damage to your crops?
13. How do you market these crops?
14. What are the average marketing costs you incur? (probe transport cost, local taxes, bribes etc.)
15. What is the average market price and what influences it?
16. What should be done to enhance the production of these crops? What roles can and can’t you play to achieve the above goal?
ANNEX 3: Interview guide for input dealers

1. When did you start your organization/business?
2. What is the size of your organization and in which areas are you operating in Northern Uganda?
3. What kind of inputs are you dealing in and how do you procure them? Which of these inputs are related to the sesame/cassava/ground nut/soybean/sorghum/maize/rice value chains? (probe: machinery, equipment, seeds, chemicals etc.).
4. What are their selling prices and how do you determine these prices? (probe: buying prices, transport costs, etc.)
5. Who are your customers and who among them are the most important and why? (probe: individuals, government and non-government organizations, CSOs).
6. Do you provide any augmented services or after-sales services to your customers besides selling those inputs and which are these services? (probe: credit, production and market information, transport, training, demonstrations, repair, spares).
7. Do you charge your customers for any these services and what are the rates looking like?
8. What challenges are you facing in this business?
9. What can be done to mitigate these challenges and by whom?
10. Do you know of any input dealer operating in this area? Which are they and what do they deal in?

Thank you for your time. Do you have additional observations or comments that we have not discussed?
ANNEX 4: Interview guide for traders/exporters

Questions about Clients/Buyers

1. Which crop commodities do you trade in and what are volumes traded annually?
2. Who are your main clients (buyers)?
3. Whom are you currently selling to? If different from the past, what are the reasons for the change?
4. Where and how did you find your clients for the first time?
5. How do you learn about your clients’ preferences? (probes: order quantities, types of product preferred, standards, quality requirements, delivery dates)
6. What type of storage do you have currently? What is your storage capacity?
7. If you desired a different form of storage, what would that be and why?
8. How is power wielded amongst value chain actors? Who holds it and who benefits from it? Do actors in the chain enjoy equal or fair bargaining power? What are their individual and collective capacities to negotiate? Can value chain intervention redress any imbalance?
9. How would you characterize your relationships with your principal clients? (probe: independent, close, collaborative, difficult, lots of information passes between you, client is in charge, they direct you)
10. Would you say that in your relations with your clients there is a lot of trust, there is some trust, or there is no trust? Why?
11. In thinking about one or two of your principle clients, how has your relationship changed with these clients from the beginning until now?
12. Does your firm receive any assistance/help or collaboration from your clients? (probes: Advances, credit, information, inputs, technical assistance, recommendations)
13. What are the steps you usually take to ensure that you meet your clients’ specifications, including delivery date and quality? (Normally, how difficult is it to comply with your clients’ requirements? What do you have to do?)
14. What challenges do you face in your business arising out of the operating environment (corruption, bureaucracy, transparency)?
15. Does the value chain upgrading have potential to open new avenues and opportunities for corruption or bureaucracy? How can this be mitigated?
16. Are there policies related to the value chain business economic environment that cause conflict among chain actors or with others. Are there policies benefiting one group of actors at the expense of another?
17. What is the government’s role in your industry? Do you view their activities positively or negatively?
18. What are the challenges exporting crop commodities? Are there any special challenges exporting to Uganda, Sudan, Kenya, Egypt etc.?
19. How do you arrive at the sale price? What are the factors influencing this price?
20. What prices are you currently trading crop commodities?

Questions about Suppliers/Producers

21. What are all the ways you source the products you sell, how do you find your products? Who are your main suppliers?
22. Do you buy your products from individual producers, from associations (groups) of producers or brokers?
23. What is the purchase price?
24. What determines the price you purchase at?
25. How many producers do you work with?
26. Do you have preferred areas to buy from?
27. If you have different types of suppliers, how would you characterize them? (In other words, what are the characteristics of each type of supplier?)

28. How do you communicate information to your suppliers regarding your requirements in terms of quality of produce, size, chemical use, delivery dates, etc.?

29. How do you demand that your suppliers meet the requirements? What difficulties do your suppliers have in meeting your demands? Do you help them? How?

30. How do you work with your suppliers to ensure that they satisfy your requirements for quality? What do you do to encourage them? What pressures do you apply?

31. What changes would you like to see your suppliers make?

32. Have you communicated this to them? How do they respond?

33. What are the difficulties suppliers have in making these changes?

34. What can you (yourself) do to facilitate or demand these changes?

**Other questions**

35. What are the three most serious risks for your enterprise?

36. Do you have additional observations or comments that we have not discussed?

Thank you for your time. Are there other players in this value chain that you think we should talk to? Could you give me referrals?
ANNEX 5: Interview guide for processors

Questions about Buyers/Clients

1. What are the main products that you sell?
2. What are all the ways that you sell your products (market outlets)? To whom do you sell your products?
3. What are the differences between your clients? To whom do you prefer to sell? (probes: frequency, price, bargaining/negotiating costs, volume, quality, consistency)
4. How do you learn about the new products that buyers want? How do you learn about market taste and quality requirements?
5. How did you first meet your clients/buyers?
6. Do you receive any form of assistance/help from your clients/buyers? (probe: cash advances, advances in materials, training, transport, record keeping)
7. What steps do you take to meet your client/buyers specifications, including delivery date and quality?
8. What challenges do you face when it comes to your buyers?

Value Addition

1. How much are you currently paying for raw materials?
2. What is your conversion rate between raw materials and finished product?
3. What are your processing costs?
4. What is your current sales price for finished product? Do you sell to everyone at the same price?
   If no, what causes price variance?
5. What is your current sales price for by-products? Do you sell to everyone at the same price? If no, what causes price variance?
6. How do you arrive at an agreed sales price for products and by-products?
7. Have you identified any needs for technological upgrades? If yes what are the likely efficiencies that this technology update will deliver?
8. Are there hindrances or enablers for this technology upgrade?

Questions about Suppliers/Producers

1. What are all the ways you obtain the products to process? Who are your suppliers?
2. What are the differences between the suppliers you work with? (probe: quality, price, punctuality, standards, volume, costs of collecting raw materials, risks)
3. Which type of supplier do you prefer to buy from?
4. Do you buy directly from farmers? If so, do you buy from individual farmers or from groups of farmers? What is the typical landholding of the farmers you buy from?
5. How many suppliers (of each type) do you buy from?
6. How do you first find your suppliers? (probe: people you know, contacts, family, neighbours, language groups)
7. What kinds of help or services do you provide to your suppliers? (probe: inputs, seeds, credit, market information, irrigation techniques, technical assistance in better farming practices, help with certification)
8. How do you communicate your product requirements to your suppliers?
9. What are the difficulties suppliers have in meeting your requirements?
10. In what ways are suppliers reluctant to make these changes?
11. What type of storage do you have currently? What is your current storage capacity?
12. Would you desire a different type of storage? If yes, what benefits would this deliver e.g. cost efficiencies etc.?
13. How do you handle produce that does not meet the expected requirement e.g. cleanliness or moisture content? Do you accept or reject this type of produce?
14. If you accept this type of produce do you have any drying or cleaning facilities? If yes what are the costs involved?
15. How much do you pay if you contract an outside firm to perform these services?
ANNEX 6: Interview guide for retailers

1. **Which crop commodities are you dealing in and in what quantities? What prices do you charge currently?**
2. **What storage capacity do you have currently? What form does this storage take?**
3. **Would you prefer a different form of storage? If yes, what form would that take?**
4. **Do you buy unprocessed produce? If yes, how much do you pay?**
5. **Do you have your own processing facilities? How much does processing cost?**
6. **Can you please explain all the ways that you buy your supplies? Who are your suppliers? (probe: gender, scale, location)**
7. **What are the differences between the suppliers you work with? In other words, what are the characteristics of each type of supplier? (probe: quality, price, punctuality, standards, volume, costs of collecting products, risks)**
8. **Which type of supplier do you prefer to buy from? Why?**
9. **Do you buy directly from farmers? If so, do you buy from individual farmers or groups of farmers? What is the typical landholding of the farmers you buy from?**
10. **Who are your most important suppliers? What makes these the most important?**
11. **How many suppliers (of each type) do you buy from?**
12. **How do you first find your suppliers? (probe: people you know, contacts, family, neighbours, language groups)**
13. **What kinds of help or services do you provide to your suppliers? (probe: inputs, credit, advice on market demand)**
14. **How do you communicate your product requirements to your suppliers? (probe: quality of produce, size and appearance, delivery dates)**
15. **Are they willing or reluctant to make these changes?**
16. **What are the difficulties suppliers have in meeting these requirements?**
17. **What changes would you like your suppliers to make?**
18. **What can you do to facilitate or require these changes?**
19. **Do you pay different prices for different qualities of the same product? Can the price vary widely even for produce of the same quality?**
20. **How do you determine the price?**

**Questions about Customers/ Clients**

1. **Who are the typical customers who purchase crop commodities from your store? (Probe: characteristics, preferences, and buying behaviour, segments)**
2. **How have the requirements and preferences changed among these customers?**
3. **How has your selection of crop commodities changed over time?**
4. **Which consumer trends do you think will shape the future direction of the selected crop sectors?**
5. **What should be done now by all actors including you to ensure the agricultural value chains remains responsive to customers in future?**

**Other questions**

1. **Do you have additional observations or comments that we have not discussed?**
ANNEX 7: Interview guide for leaders of producer/traders/processors associations

Questions about Members and Services

1. How and when did this association form and how has it evolved over time?
2. What was the initial objective of this association? Has the objective changed through time?
3. How many members do you have?
4. How does one become a member of your association?
5. Which types of crops/livestock are your members involved in?
6. Do your members specialize in certain stages of production?
7. What services do you provide to your members?
8. What are the advantages of being a member of this association?

Questions about Sales and Markets

9. Does the association coordinate the sales of their members’ products? If so, how does this work?
10. Does the organization negotiate the sales price? Do they charge a commission on this?
11. Where does the association sell their products? (probes: local markets, farm gate, millers, export)
12. How do you locate new buyers?
13. Are individual members allowed to sell their products outside the association?
14. How is the role of the association different from the role of traders?

Questions about Upgrading

15. How do members of the association learn about product requirements and quality standards that buyers want? How do they learn about the changes customers want?
16. What are the difficulties producers have in making these changes?
17. Why are producers reluctant to make these changes?
18. Are there any costs or risks to members in making changes? Do they earn more or less if they make changes?
19. How does being a member of this association help them to learn about the changes buyers want and make these changes?
20. Does the association have any storage facilities? If yes what type and capacity? Is this storage suitable for your purpose?
21. If no, what type of storage do you need and why?

Other Questions

22. How does producing selected crops fit in with the other activities of the households of members (i.e., the household economic portfolio)?
23. Is production of these crops usually a full-time or a part-time activity for your members? How does the part-time status of producers affect their ability to respond to orders? (probes: seasonality, type of income needed)
24. Can some farmers produce more efficiently than others? If so, why?
25. Would you say that it is sometimes hard for members to trust the leaders of the association? Why or why not?
26. What do you think about the future for smallholders who grow these crops?
27. Do you have additional observations or comments that we have not discussed?

Thank you for your time. Are there other players in this value chain that you think we should talk to? Could you give me referrals?
ANNEX 8: Interview guide for governments officials

1. To start with, can you please provide general information about this area in terms of geographical/political units, population, major economic activities, and how it is recovering from the civil war impasse?

2. What is the importance of the agricultural sector to the economy of this area? (Probe: food security, incomes, exports especially to South Sudan)

3. What role does government currently play in the agricultural sector in this area? Has this role changed overtime and why? (probe: research, extension, input distribution, credit, production, transportation, processing, marketing)

4. In particular, what is the capacity of your agriculture department? How many staff are available, which roles do they serve and how are they facilitated?

5. How about the private sector, what role does it currently play in the agricultural sector in this area? Has this role changed overtime and why? (probe: research, extension, input distribution, credit, production and market information, production, transportation, processing, marketing)

6. Do you know of any CBOs/NGOs operating in this area with focus to the agricultural sector? Which are they and what do they do?

7. What do you see as being constraints to increased performance of the agricultural sector in this area?

8. Which strategic interventions has government so far put in place to boost agricultural production in this area?

9. What more does government need to do to increase agricultural production in this area?

Thank you for your time. Do you have additional observations or comments that we have not discussed?
ANNEX 9: Interview guide for financial institutions

1. When did you start this business and from where? How big is your organization? Do you have any branches elsewhere?
2. When did you begin your operations in this area?
3. What motivated you to come to do business in this area?
4. Which financial products do you have in general? Which of these products are targeted to farmers and agribusinesses? What proportion of total loan portfolio is dedicated to agriculture?
5. How many farmers and agribusinesses have over time obtained credit from your organization? What are the loan sizes offered – smallest, average, largest?
6. What conditions do you set for them to access loans from your organization? Do you require them to save with your organization? What interest rate do you charge at the moment?
7. What proportion of applicants meets these conditions? Do you extend any waiver to those who do not meet credit conditions?
8. How do you monitor those farmers and agribusinesses who obtain loans from your organization?
9. What are the repayment rates for farmers and agribusinesses overtime looking like?
10. Are there any institutional problems that impede your operations in serving farmers and agribusinesses?
11. What should be done to remove these impediments and who should do what?

Thank you for your time. Do you know of other financial institutions lending to farmers and agribusinesses in this area that I should talk to?
ANNEX 10: Interview guide for CSOs

1. For how long have you operated in Northern Uganda and in which districts are you?
2. Which activities, both humanitarian and developmental, have your organization been engaged in?
3. Have your organization ever been involved in the development of sesame/cassava/g-nut/soybean/maize/rice value chains? (If No, skip to question 9).
4. If yes, how were your organization involved (or still involved), where and for what period of time?
5. What were some of the challenges your organization faced in the development of these value chains?
6. What has been the impact of your organization’s involvement on the development of these value chains?
7. What still needs to be done to further develop any of these value chains and by whom?
8. Do you know of any CSO operating in this area with focus on these value chains? Which are they and what do they do?

Thank you for your time. Do you have additional observations or comments that we have not discussed?