



# Service Delivery Model Analysis

Afro-Kai Limited,  
Sorghum/Maize/Potatoes,  
Uganda

Case report

*January 2023*

## Relevance of SDM Analysis

### Smallholder Livelihoods

Agriculture, including forestry, plays a key role in the wellbeing of people and planet. 70% of the rural poor rely on the sector for income and employment. Agriculture also contributes to and is affected by climate change, which threatens the long-term viability of global food supply. To earn adequate livelihoods without contributing to environmental degradation, farmers need access to affordable high-quality goods, services, and technologies.

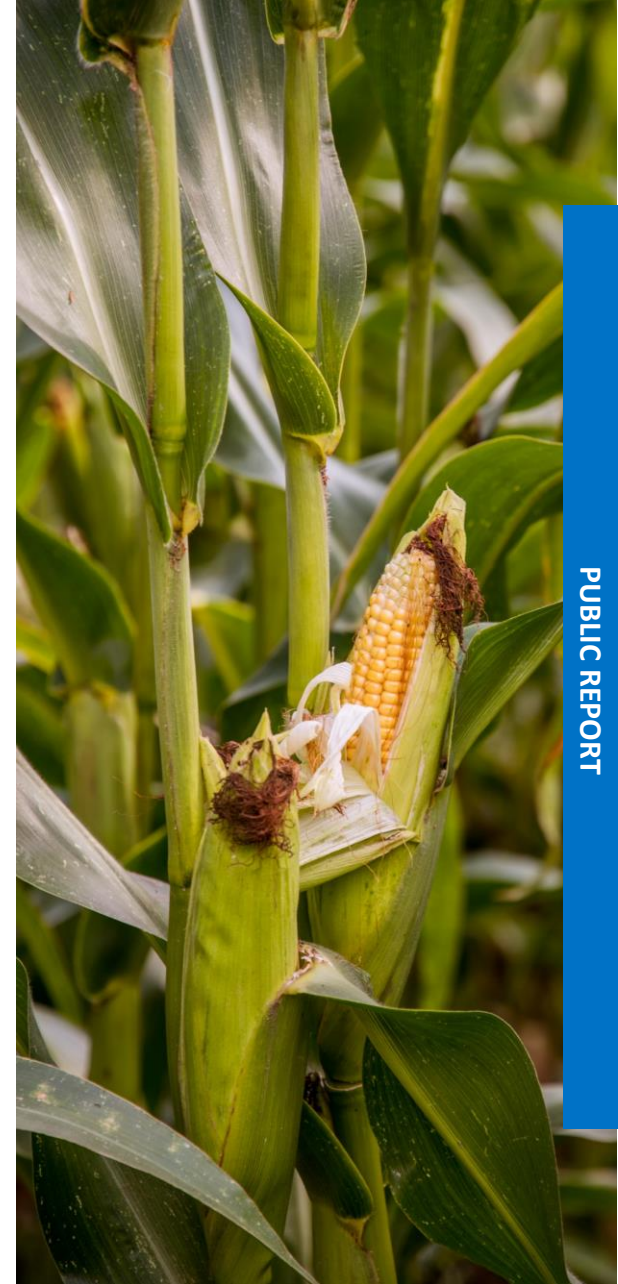
### Service Delivery Models

Service Delivery Models (SDMs) are supply chain structures which provide farmers with services such as training, access to inputs, finance and information. SDMs can sustainably increase the performance of farms while providing a business opportunity for the service provider. Using IDH's data-driven SDM methodology, IDH analyzes these models to create a solid understanding of the relation between impact on the farmer and impact on the service provider's business.

### Insights and Innovations

Our data and insights enable businesses to formulate new strategies for operating and funding service delivery, making the model more sustainable, less dependent on external funding and more commercially viable. By further prototyping efficiency improvements in service delivery and gathering aggregate insights across sectors and geographies, IDH aims to inform the agricultural sector and catalyze innovations and investment in service delivery that positively impact people, planet, and profit.

*IDH would like to express its sincere thanks to **Afro-Kai Limited** for their openness and willingness to partner through this study. By providing insight into their model and critical feedback on our approach, **Afro-Kai Limited** is helping to pave the way for service delivery that is beneficial and sustainable for farmers and providers.*



## The study was commissioned under IDH's Farmfit Africa Program

### MISSION



Transforming the market for agricultural service providers and raising smallholder farmers' incomes by developing proven business models, raising access to finance, improving food trade and providing useful sector insights

#### FARMFIT BUSINESS SUPPORT

Business analytics

Innovation

Connecting partners

**Farmfit Business Support** provides businesses and banks the tools they need to optimize cost-efficiency and maximize the impact of their engagement with smallholder farmers. It helps identify areas ripe for innovation and matches them with the most suitable finance, to bring them to scale.

#### FARMFIT INTELLIGENCE CENTRE

Access to data

Business modelling

Actionable insights

**Farmfit Intelligence Centre** shares key insights on how to make smallholder value chains more efficient and effective. Its benchmarking database contains insights from 100+ smallholder farmer engagement models, helping partners innovate in technology and gender inclusion. The robust data set helps private sector make better business decisions.

#### FARMFIT FUND

Deal prep. and design

Finance

De-risk investment

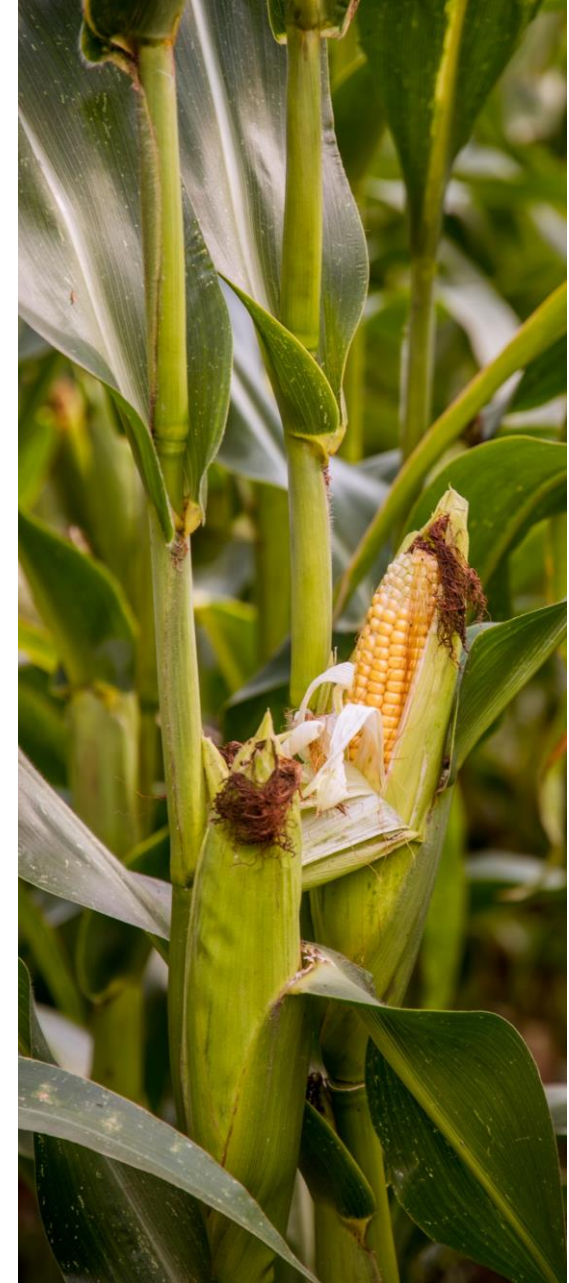
**Farmfit Fund** is the world's biggest ever public-private impact fund for smallholder farmers. The Fund's innovative structure de-risks investments in smallholder farming and helps drive sustainable impact by showcasing the commercial opportunity represented by smallholder farming finance.

Afro-Kai is one of the companies selected to receive technical assistance (TA) under the Farmfit Business Support pillar. The SDM analysis will help identify opportunities for Afro-Kai to change and optimize their sourcing and service model based on which TA interventions will be designed.

<b>AKL</b>	Afro-Kai Limited
<b>BoD</b>	Board of Directors
<b>EAC</b>	East Africa Community
<b>ERP</b>	Enterprise Resource Planning
<b>FMS</b>	Farmer Management System
<b>FoF</b>	Female-Operated Farms
<b>GAP</b>	Good Agricultural Practices
<b>ICRC</b>	International Committee of the Red Cross
<b>IT</b>	Information Technology
<b>LI</b>	Living Income
<b>MoF</b>	Male-Operated Farms
<b>NGOs</b>	Non-Governmental Organizations
<b>OPV</b>	Open Pollinated Variety
<b>PDC</b>	Primary Data Collection
<b>SDM</b>	Service Delivery Model
<b>TA</b>	Technical Assistance
<b>UGX</b>	Uganda Shillings
<b>WFP</b>	World Food Programme

Throughout the report, you can click the corresponding icons on the right of each page to be taken to the first page of that chapter

	1. Executive Summary
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	5. HUB Business Case
	6. Agent Business Case
	7. Farmer Business Case
	8. Annex



# 1. Executive summary

# Afro-Kai Limited (AKL) envisions significantly increasing smallholder sourcing from 5 to 50% in a cost-efficient and effective way while enhancing its production and processing capabilities in the next 3 years.

## About Afro-Kai

**Growth ambitions:** Established 45 years ago, AKL has been at the forefront in developing the grains value chain in Uganda. It has set up 4 grain handling facilities in different locations in the country and recently ventured into potato sourcing. AKL has traditionally sourced from traders but is increasingly focusing on direct sourcing from farmers. It envisions growing its farmer base from 2,000 to 10,000 by 2024.

**Service delivery model:** AKL [service delivery structure leverages a hub and agent model. Agents play a critical](#) role in training and extension services and input distribution. [Through the hub](#), AKL, working with other partners seeks to provide a one stop center where farmers access inputs, finance and mechanization services. The company also has a nucleus farm that farmers visit for training and extension purposes.

**Sales channels:** AKL mainly supplies to the local (Uganda) market with untapped opportunities in premium markets such as Kenya. Export account for only 5% of the total sales. Market is also concentrated on few institutional clients (80% of the sales) such as WFP and ICRC who fix prices (often lower) for the grain.

**Organizational capacity:** [AKL faces capacity gaps across key business processes, human resources and digital capabilities](#) which hinder effective engagement with the farmers. Notably, the company is in the process of implementing an FMS to reduce/eliminate the supply chain inefficiencies due to manual processes.

## Focus of the SDM analysis

**This SDM analysis provides critical insights to further refine the SDM structure of AKL and assess the business case at various levels:**

<b>Farmer</b>	<ul style="list-style-type: none"> <li>Understand the main farmer segments and their economic performance.</li> <li>Compare current farmer incomes to the living income.</li> </ul>
<b>Afro-Kai</b>	<ul style="list-style-type: none"> <li>Determine the key pressure points and opportunities in the supply chain.</li> <li>Assess the main profitability drivers of the business.</li> <li>Conduct a working capital needs assessment.</li> </ul>
<b>FICA seeds</b>	<ul style="list-style-type: none"> <li>Assess the business case for FICA seeds and economics of their collaboration with AKL.</li> </ul>
<b>Hub</b>	<ul style="list-style-type: none"> <li>Understand the business case for the grain hub model looking at different services.</li> <li>Assess value, cost, and risk distribution for the service coalition/hub partners.</li> </ul>
<b>Agents</b>	<ul style="list-style-type: none"> <li>Evaluate the business case for the village agent model.</li> </ul>

## By segmenting their farmers and graduating them based on performance Afro-Kai can tailor services in a more effective manner leading to increase in farmer incomes and reduced service cost.

### Observations

#### Farmer segments

- AKL has currently not segmented its farmer base making it challenging to customize service offering which also increases cost of services.
- Our analysis [established four distinct segments based on land size](#) and crop combination; over 65%<sup>1</sup> of the farmers are small scale farmers with an average of 3 acres.
- Close to [30% of the farmers are female](#), who on average report [a lower level of input usage, access to credit and yields demonstrating a high need for intervention](#).

#### Farmer income

- Marketable surplus for the SDM farmer is estimated to more than double over the five-year period driven by increased farmer productivity and decrease in post harvest losses.
- As a result, annual net income of [the SDM farmers is estimated to grow by over 200%](#) for all the [four segments](#) to average [USD 1,510 for small scale farmers](#) and [USD 3,680 for medium scale farmers](#) by year 5.
- All farmer segments are expected to reduce their living income gap from an average of [91% in year 1 to 65% in year 5 for small scale farmers](#) and 72% to 27% respectively for the medium scale farmers cultivating only maize. The SDM medium scale farmer cultivating both maize and sorghum is expected to [achieve living income by year 5](#).

### Recommendations/Opportunities

- By implementing [a farmer graduation model as proposed in this analysis](#), AKL can incentivize farmers to stay loyal and secure more grain volumes, while increasing the income of the farmers they work with.
- Fully leverage data collected through the farmer management system (FMS) that they intend to implement to understand performance of the different farmer segments and tailor services.
- Given the low yields and low access to resources (credit, inputs) amongst the women farmers AKL works with, there is a need to a) [design targeted solutions to improve women performance](#) and b) [determine gender key performance indicators](#) to track progress of the women farmers that they engage.

<sup>1</sup> Out of 319 farmers

### Farmer business case



# Although partly relying on donor funding in the initial years of the SDM, Afro-Kai can self-sufficiently support its SDM with an annual gross margin of 10%.

## Observations

## Recommendations/Opportunities

AKL business case

*For business sensitivity reasons, we have excluded this section from the public report.*

**The current SDM of Afro-Kai has the potential to generate significant demand for FICA seeds who are expected to pay between 10-15% commission to facilitate distribution of the seeds.**

Observations

Recommendations/Opportunities

FICA business case

*For business sensitivity reasons, we have excluded this section from the public report.*

# The hub is projected to be self-sufficient by the third year as the demand for inputs and post-harvest services increases, resulting in higher service revenues.

## Observations

## Recommendations/Opportunities

Hub business case

*For business sensitivity reasons, we have excluded this section from the public report.*

## Given the importance of agents in the SDM, it is critical for AKL to outline a clear plan for graduating the agents which can help build loyalty and enhance performance.

### Observations

- Afro-Kai requires fewer (less than half) agents and farmer groups for their sourcing [model to achieve the annual sourcing targets set for maize and sorghum](#).
- However, increasing the number of farmers and [volume to be managed](#) by each agent and farmer group might go beyond what an agent is capable of aggregating given their capacity.
- Farmers who become an agent for Afro-Kai are estimated to double their annual income [after five years](#) with 50% of the income generated from agent activities.
- Becoming an agent for Afro-Kai is projected to be a competitive occupation against other income generating activities such as boda boda (motorcycle) [driving or performing other off-farm labor with higher average incomes recorded over the five years](#).
- Agent are projected to increase the volume of grain they manage from [70 Mt/year \(year 1\) to 730 Mt/year in year 5 \(value 730 M UGX/year\)](#) in order to meet Afro-Kai's sourcing targets. This volume and value is expected to be beyond current agents' capabilities.

### Recommendations/Opportunities

- Leveraging agent performance data from the farmer management system, AKL can incentivize the normal [agents to graduate to super agents in order to grow incomes](#).
- Introduce additional incentives such as bonuses based on loyalty, volume sourced, number of farmers recruited/managed etc. for the agents.
- Further assessment should be done to understand the capacity (storage, working capital) of the agents, and the farmer groups. [This would help determine the optimum number of agents by AKL and inform the investments needed for each agent](#).

#### Agent business case

# 2. About the SDM

*Understanding Afro-Kai's strategy, and business model*

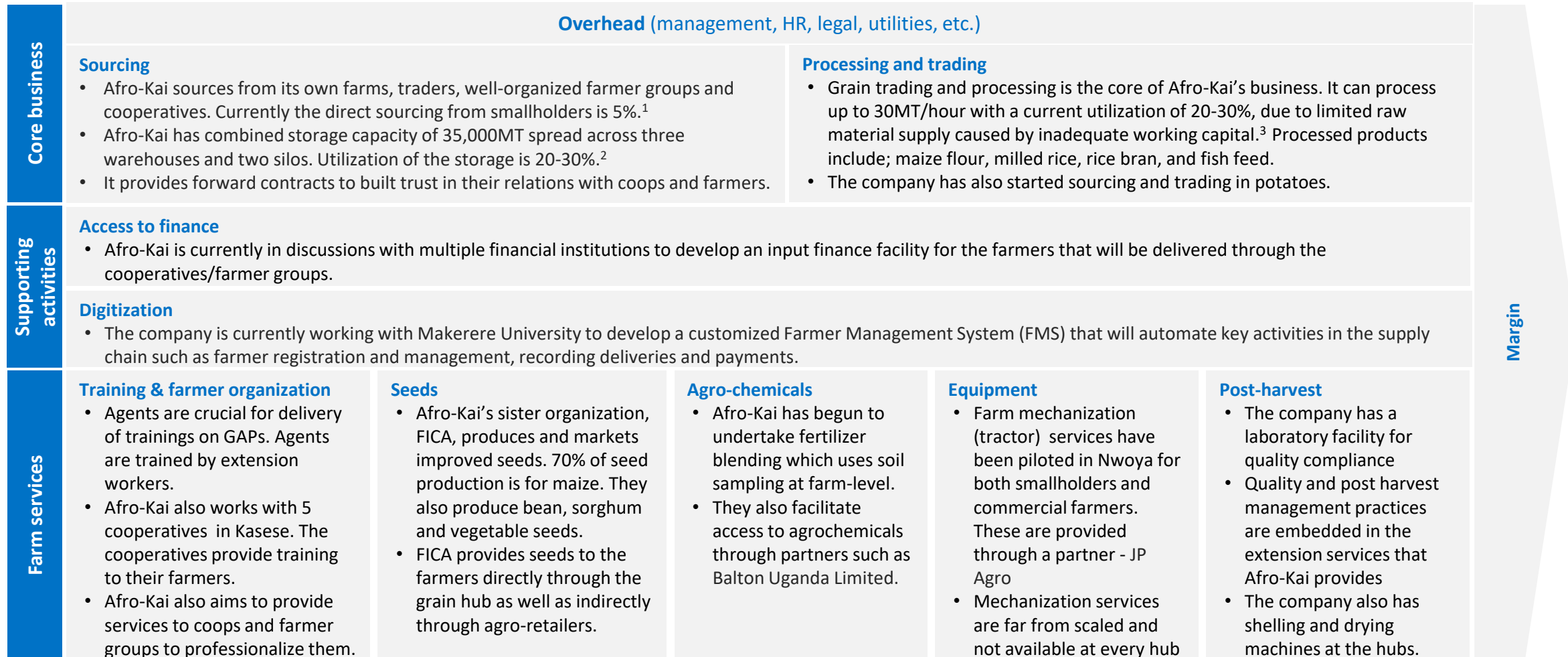
# Afro-kai Limited envisions increasing smallholder sourcing from 5 to 50% while growing its production and processing capabilities in the next 3 years.



Goals & Aspirations <sup>1)</sup>	Where to Play	How to Win	Capabilities Required
<p><b>Market ambitions and share</b></p> <ul style="list-style-type: none"> <li>• Leading in grain processing in Uganda</li> <li>• Revamp Nwoya and Kasese processing facilities for grain value addition</li> <li>• Install and fully commission fertilizer blending plant</li> <li>• Become the 2<sup>nd</sup> fish feed processing company in Uganda</li> </ul> <p><b>Business growth</b></p> <ul style="list-style-type: none"> <li>• Expand maize trade: 30.000 to 250.000 MT</li> <li>• Increase export from 5 to 25%</li> <li>• Increase smallholder sourcing from 5 to 50%.</li> <li>• Increase grain production at the nucleus farm (100 acres) in Masindi to 1200 MT</li> <li>• Increase revenue to UGX 35 billion annually</li> <li>• Reduce costs of doing business by 25%</li> </ul> <p><b>Impact goals and farmer reach</b></p> <ul style="list-style-type: none"> <li>• Support and service 10,000 maize farmers to produce 15.000 MT maize and 1,500 MT sorghum by 2024.</li> </ul>	<p><b>High Priority Areas</b></p> <ul style="list-style-type: none"> <li>• Attract finance for expansion of trade volumes and facilities (working capital and investment)</li> <li>• Create strong farmer networks and organizations in sourcing areas</li> <li>• Optimize utilization of storage and processing capacity (currently 20-30%)</li> <li>• Increase smallholder grain quantities and quality through optimized access to extension services and inputs</li> <li>• Support farmer producer organisations with strategic linkages to financial institutions for crop financing</li> <li>• Provide support to potato farmers</li> </ul> <p><b>Lower priority areas</b></p> <ul style="list-style-type: none"> <li>• Improving efficiency of grain transportation.</li> <li>• Farmer support for soya beans</li> </ul>	<p><b>Points of Differentiation</b></p> <p><i>Price</i></p> <ul style="list-style-type: none"> <li>• Price differentiation by providing value addition services.</li> </ul> <p><i>Promise to clients</i></p> <ul style="list-style-type: none"> <li>• High quality grains for off-takers and consumers, complying to the Uganda National Bureau of Standards.</li> </ul> <p><i>Farmer engagement and services</i></p> <ul style="list-style-type: none"> <li>• Build a strong farmer network supported by a strong agent network</li> </ul>	<p><b>Organizational capabilities &amp; HR</b></p> <ul style="list-style-type: none"> <li>• More marketing and sales personnel</li> <li>• Improve farmer management and engagement strategy</li> <li>• Strengthen extension services and field agent network</li> <li>• Hub personnel including a hub manager and agribusiness officers</li> </ul> <p><b>Market and sales</b></p> <ul style="list-style-type: none"> <li>• Cross-border market linkages</li> </ul> <p><b>Finance</b></p> <ul style="list-style-type: none"> <li>• Attract equity for business expansion</li> <li>• Attract affordable debt</li> <li>• Public, commercial and private financing</li> </ul> <p><b>Assets/infrastructure</b></p> <ul style="list-style-type: none"> <li>• Value addition of oil seed and fish feed facilities</li> </ul>

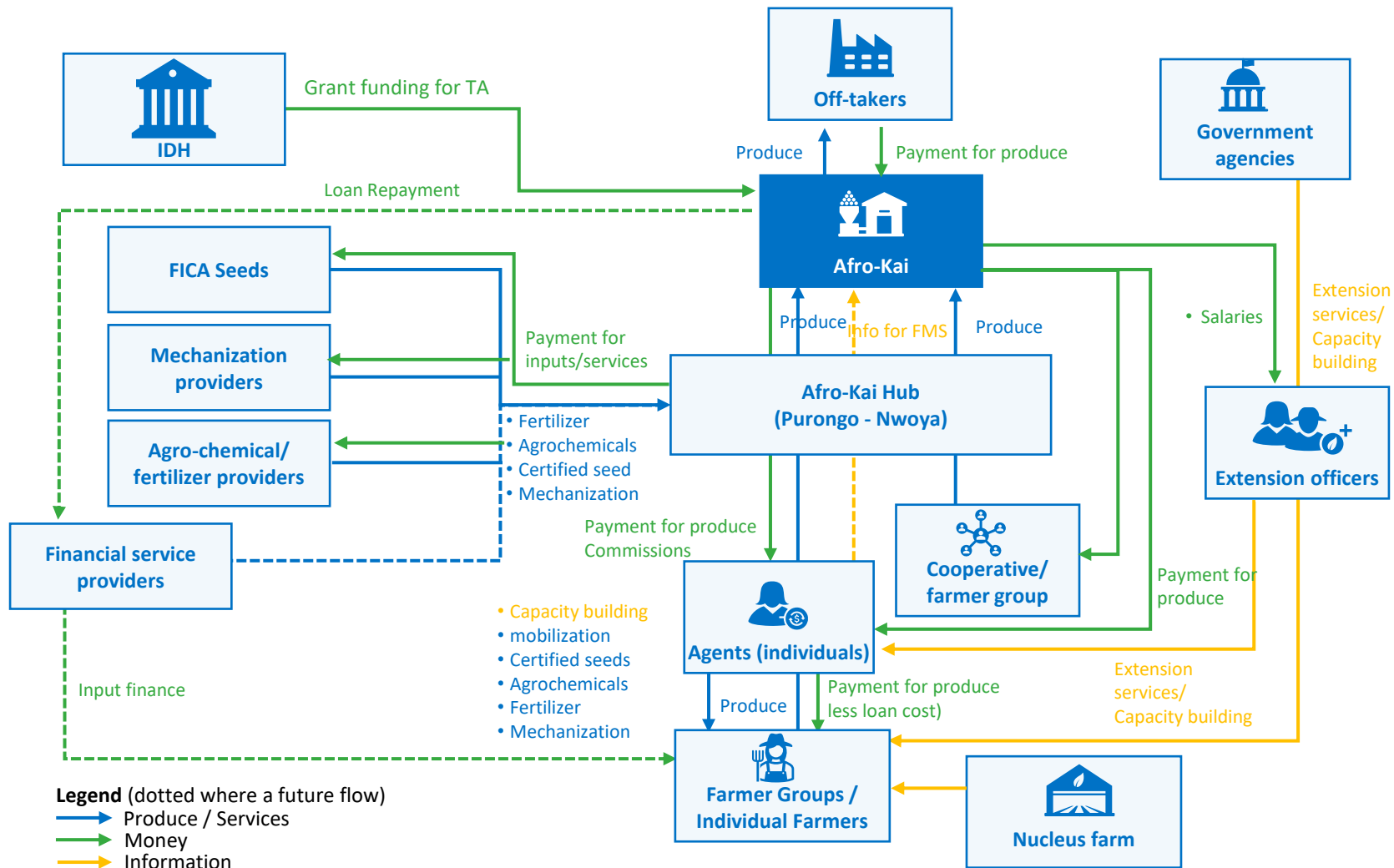
Sources: 1) Afro-Kai Limited, TA proposal

# Through their service delivery model, Afro-Kai provides farmers with access to trainings, quality inputs, mechanization services and credit in order to increase the volumes of grain sourced.



1,2,3) Afro-Kai TA proposal

## Afro-Kai leverages both agents and central hubs to facilitate access to services and source from farmers. Agents play a critical role in mobilization, extension services provision and input distribution.



### Description of activities and flows

- IDH supports Afro-Kai in the establishment of its SDM by providing co-funding for three years.
- Afro-Kai operates three Hubs in **Purongo-Nwoya, Matugga, and Rugendabara-Kasese**. The Hubs serve as aggregation centres for Afro-Kai and provide a one stop shop where farmers can access inputs, mechanisation, and value addition services. **This analysis focused on the hub in Purongo.**
- Agents mobilize, train, and source from farmers. Sourced produce is delivered to the Hubs by the agents. Agents then receive a commission for the purchase and aggregation of produce.
- The nucleus farm is a 100 acres production and demonstration farm (also used for seed production) located in Masindi. Farmers near to the farm can visit for training and extension purposes.



## Afro-Kai works with a broad range of partners to provide services and improve the productivity of the farmers they source from.

Stakeholders	Organizations	Function (within this SDM and business model)	Revenue model (within this SDM)	Incentive to participate (within this SDM)
Extension services	<ul style="list-style-type: none"> <li>• NAADS (National Agricultural Advisory Services)</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of rural agricultural services through their extension officers</li> </ul>	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>	<ul style="list-style-type: none"> <li>• Promote the development of agricultural value chains in Uganda</li> </ul>
Mechanization services	<ul style="list-style-type: none"> <li>• JP Agro</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of tractor services to the farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Payment for services delivered</li> </ul>	<ul style="list-style-type: none"> <li>• Access to organized customers/farmers.</li> <li>• Increased revenues</li> </ul>
Financial Service Providers	<ul style="list-style-type: none"> <li>• DFCU</li> <li>• Postbank</li> <li>• Stanbic Bank</li> <li>• Equity Bank</li> <li>• Centenary Bank</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of working capital to procure the produce (Stanbic Bank)</li> <li>• Input finance for farmers. A small pilot with Stanbic bank took place. Afro-Kai aims to scale this pilot</li> </ul>	<ul style="list-style-type: none"> <li>• Interest income on working capital provided to Afro-Kai</li> <li>• Interest on farmer loans</li> </ul>	<ul style="list-style-type: none"> <li>• Obtain access to farmers to expand customer base</li> <li>• Growth in the loan portfolio</li> </ul>
Support organizations/NGO	<ul style="list-style-type: none"> <li>• World Vision</li> <li>• Goal Uganda</li> </ul>	<ul style="list-style-type: none"> <li>• Currently exploring collaboration with these NGOs</li> <li>• Enhancing access to extension services and inputs</li> </ul>	<ul style="list-style-type: none"> <li>• Not applicable</li> </ul>	<ul style="list-style-type: none"> <li>• Promote development of agricultural value chains in the country</li> </ul>
Input providers	<ul style="list-style-type: none"> <li>• FICA Seeds</li> <li>• Balton Uganda Limited</li> <li>• Royal Plants and Nurseries</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of fertilizers, agrochemicals and certified seed</li> </ul>	<ul style="list-style-type: none"> <li>• Margins from sell of fertilizers, agrochemicals and certified seed</li> </ul>	<ul style="list-style-type: none"> <li>• Increased sales volumes</li> <li>• Wider customer reach</li> </ul>
Off takers	<ul style="list-style-type: none"> <li>• WFP, ICRC, The Samaritan Purse</li> <li>• Export to Kenya, South Sudan, Rwanda and Burundi</li> <li>• Ministry of Defense, schools, supermarkets</li> </ul>	<ul style="list-style-type: none"> <li>• Off-take produce and processed products</li> <li>• Distribution of the produce/products to end consumers</li> </ul>	<ul style="list-style-type: none"> <li>• Margins on produce/products</li> <li>• Not applicable for the humanitarian organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Improved quality and quantity of produce</li> </ul>

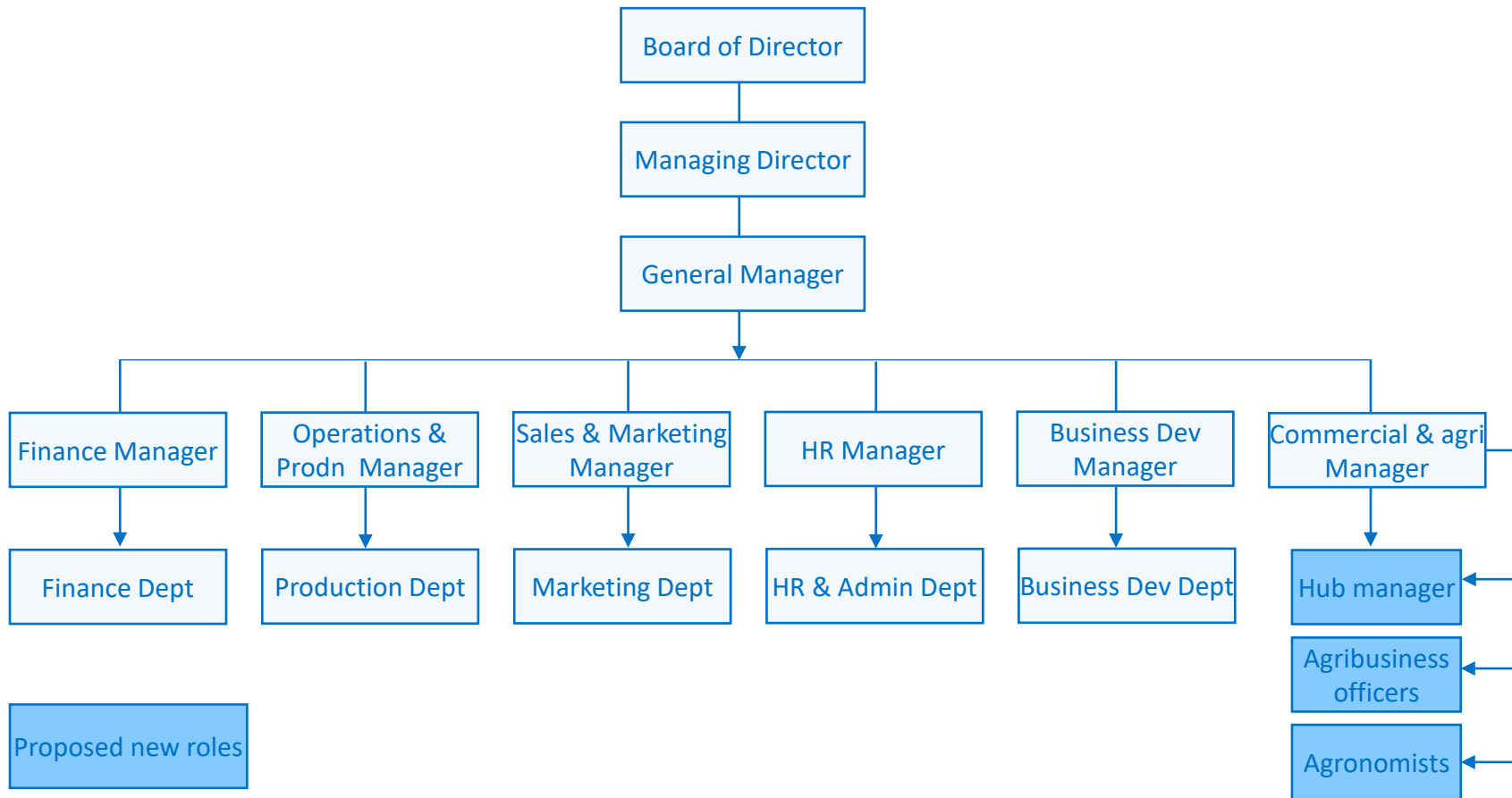
Partnership status

On-going

Exploration

# The current organization structure needs to be updated to reflect the envisioned growth and the new roles to support the development of the SDM.

## ORGANOGRAM



- The Board of Directors (BoD) supervises and sets the direction that the company must follow and appoints and supervise the top management of AKL.
- The company has **90 full time employees** of whom **20 are women**.
- Of the women **9** are in management positions accounting for more than **50%** of the management team.
- The commercial and agribusiness manager oversees farmer engagement activities including; recruitment and management of agents, overseeing farmer trainings and service delivery, and coordinating sourcing.

## There are key organizational capacity gaps that need to be addressed for Afro-Kai to effectively increase their engagement with smallholder farmers.

	PARAMETERS	OBSERVATIONS/GAPS
PROCESSES	Farmer /agent selection and management	<ul style="list-style-type: none"> <li>While AKL has established a criteria for selecting their agents, the same has not been outlined for the farmers. Further, there is no clear framework for segmenting, servicing, assessing performance and graduating farmers and agents.</li> </ul>
	Grain buy back	<ul style="list-style-type: none"> <li>High levels of side selling are expected especially in the first years where AKL expects farmers to deliver less than 50% of their produce. The company needs to focus on building loyalty amongst the farmers by ensuring prompt payment, payment of fair prices and provision of services.</li> <li>Manual and paper-based farmer and agent profiling and management processes which is tedious and sometimes result in incomplete records. This further hinders stock visibility at agent level for AKL to organize for transport and payment.</li> </ul>
	Transport and logistics	<ul style="list-style-type: none"> <li>The company relies on rented transport services to deliver produce from the agents/cooperatives level to the hubs. Proper planning thus needs to be explored to ensure optimization of the transport process.</li> </ul>
	Storage and warehousing	<ul style="list-style-type: none"> <li>Current utilization of storage facilities is quite low (20-30%). On the other hand, storage capacity at the agent level is limited necessitating Afro-Kai to consider mobile and/or community aggregation centers that can be used by their agents.</li> </ul>
	Processing/ value addition	<ul style="list-style-type: none"> <li>Utilization of the processing (cleaning, drying and milling) capacity is only 20-30%, due to limited supply of produce. There is a need to generate demand for the value addition services especially at the hub level.</li> </ul>
	Quality management	<ul style="list-style-type: none"> <li>Agents lack necessary equipment such as moisture meters to ensure quality at the aggregation level. Further, quality management procedures have not been documented at the agent level.</li> </ul>
	Sales and marketing	<ul style="list-style-type: none"> <li>AKL mainly supplies to the local (Uganda) market with untapped opportunities in premium markets such as Kenya. Export account for only 5% of the total sales. Sales are also concentrated (80%) on few institutional clients such as WFP and ICRC who fix prices (often lower) for the grain.</li> </ul>
PEOPLE	Organization structure	<ul style="list-style-type: none"> <li>The current organogram needs to be updated to reflect the company's envisioned growth, particularly introducing a department/business unit focused on farmer services with clear reporting line.</li> </ul>
	HR capabilities	<ul style="list-style-type: none"> <li>There is a need to expand the agronomy team (currently only 3 extension workers and no agronomist). A dedicated person is also needed to oversee performance of agents given their importance. Key roles such as hub manager also need to be filled to fully operationalize the hub services.</li> </ul>
TECHNOLOGY*	Digital capabilities*	<ul style="list-style-type: none"> <li>AKL uses digital technology for accounting and inventory management processes. It is also currently developing a customized FMS for farmer profiling and management which was previously done manually. The company has however not fully leveraged digital marketing channels to grow the business.</li> </ul>

\*Detailed digital maturity assessment outlined [on slide 17](#)

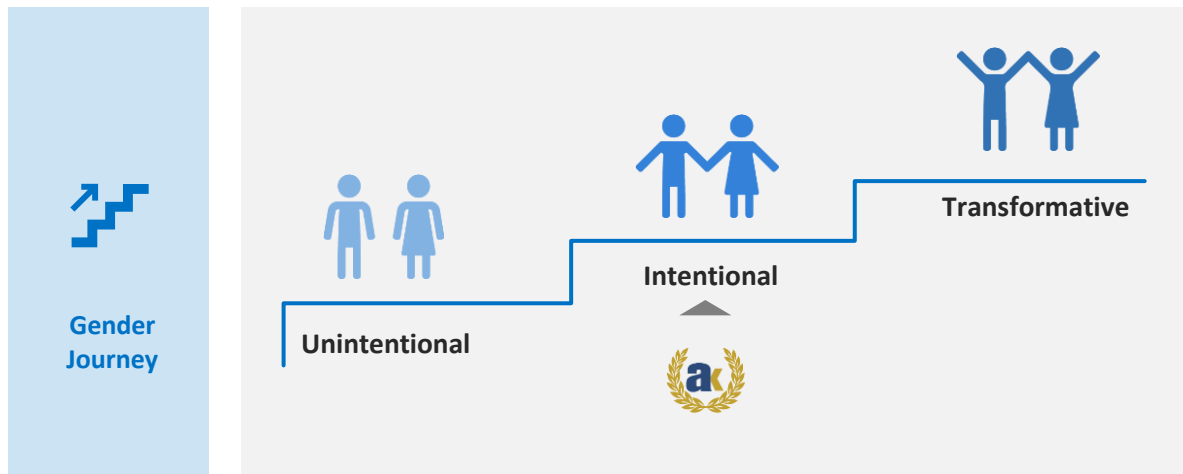
## While Afro-Kai has made some steps to enhance gender equality; progress can be further achieved by implementing the gender strategy/policy and outlining measurable gender targets.

Category	Status	Observations
<p><b>Gender strategy</b> Is gender equality a strategic goal for Afro-Kai Limited which is communicated in documents?</p>	PARTLY	A gender policy is currently in the drafting stage – pending approval by the board. The policy advocates for equal opportunities for all regardless of the gender. The human resource policy also advocates for equal opportunities and no discrimination based on gender.
<p><b>Data collection</b> Does Afro-Kai Limited collect data on staff or customers / farmers disaggregated by gender?</p>	PARTLY	Afro-Kai has previously not been collecting farmer data. However, with the farmer management system that they are planning to implement, farmer data collected will be disaggregated by gender - this includes data on acreage, yields and volumes delivered. Staff data is however, disaggregated by gender.
<p><b>Inclusive workplace</b> Does Afro-Kai Limited have policies or practices to make the workplace inclusive for both women and men?</p>	YES	Both the company’s human resources and gender policies advocate for workplace inclusivity. The company has also put in incentives to make the workplace better for women and especially new mothers e.g., flexible and shorter work hours after the maternity period. There are also flexible work hours for new fathers post the paternity period.
<p><b>Inclusive consultation</b> Does Afro-Kai Limited speak to or consult both male and female customers (farmers) to learn about their different needs and preferences when designing a product</p>	PARTLY	The company has recruited both male and female agents who manage different groups. Through the agents, Afro-Kai consults with the farmers (male and female) to understand the various needs and how they can tailor the services to the farmer needs.
<p><b>Inclusive tailoring</b> If services are tailored based on customers’ needs and preferences, does Afro-Kai Limited tailor these based on how needs may be different for men/women?</p>	NO	Currently, the services provided are not tailored based on the gender of the farmer.
<p><b>Independence and control over resources</b> Does Afro-Kai Limited provide services that allow women to have more independence and control over resources or move into roles in which they can gain more value?</p>	PARTLY	The company seeks to promote female farmers to become agents. By empowering women to become agents, they drive them into roles where they can gain more income and influence more female farmers.

## While Afro-Kai has made some steps to enhance gender equality; progress can be further achieved by implementing the gender strategy/policy and outlining measurable gender targets.

### Gender Assessment

#### JOURNEY ON GENDER INTENTION LADDER



#### Current situation

- Afro-Kai is gender intentional. The company has developed a gender policy to ensure gender is mainstreamed across the key activities internally and externally.
- The human resource policy also advocates for an inclusive workplace where both men and women have equal access to resources.
- The company is implementing a farmer management system through which they will be collecting and recording gender disaggregated data. The data will also be assessed to inform decision making.
- The company seeks to work with more women farmers and targets at least 45% of their farmers being women.

### Possible measures to be taken

#### INTERVENTIONS / KPIs

##### Best practices to implement in becoming transformative

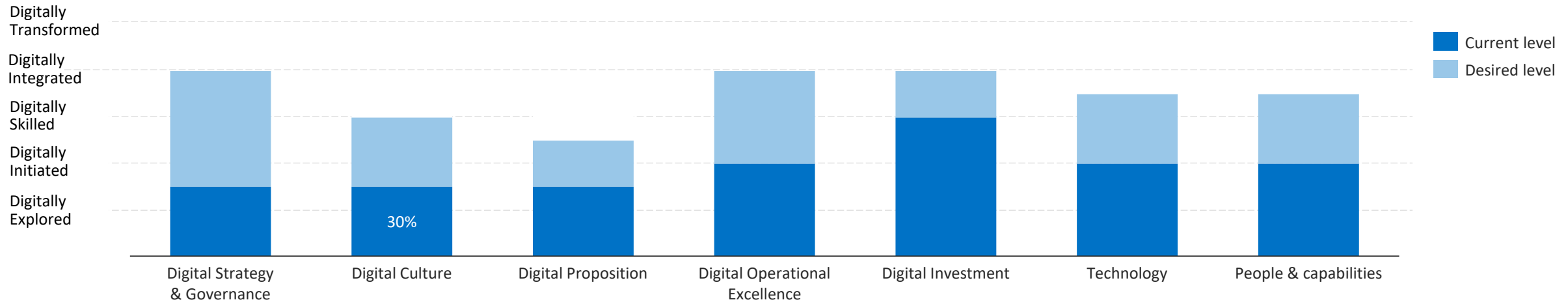
- **Fully execute the gender policy/strategy** to ensure inclusion of women both in the workplace and as part of their customer base.
- **Establish Key Performance Indicators (KPIs)** e.g., targets on the number of male and female farmers they are aiming to reach, develop a roadmap to get there and allocate resources to monitor and measure gender goals.
- Use **sex disaggregated data collected** to inform service delivery to farmers e.g., track sex disaggregated farm level metrics such as yield and income to understand gaps and need for services and skills. [PDC analysis for example indicated a lower level of input usage, access to credit and yields amongst the female farmers demonstrating a higher need.](#)
- **Inclusive tailoring of services** by identifying women farmer's needs and preferences in view of the types of trainings, times and location as well as service package.

##### Potential KPIs to monitor on the gender journey

- Number of women farmers with reduced living income gap
- Number of women with access to and control over income
- Increase in income for women
- Increase in the number of women accessing services
- Increase in number of women agents

[See annex for details on the gender ladder.](#)

# Afro-Kai Limited is digitally initiated; the company is using enterprise resource planning (ERP) systems for accounting and inventory processes and is also currently developing a farmer management system.



## Results

The digital maturity assessment for Afro-Kai shows that the organization is digitally initiated:

- Overall, the leadership acknowledges the role that digital technologies play in enhancing operational excellence.
- The company leverages an ERP system for their accounting and inventory management processes.
- They are also currently working with Makerere University to develop a customised FMS to digitize key supply chain processes (farmer and agent profiling and management).
- The company has set aside a budget for the IT personnel and purchase of smartphones. The total TA budget allocated to farmer digitization activities is ~USD 27,000 with Afro-Kai contributing more than 50% of this budget.
- They have a digital communication strategy but this is yet to be implemented.
- The company has limited digital media presence/activities.

## Recommendations

- Ensure employees from all layers of the company are onboarded with the digital agenda (particularly on the understanding of the FMS), to avoid a lack of alignment and working at different speeds.
- Continue the focus on digitization from a strategic perspective, including integrating the FMS with other internal systems, training on farmer/agent digital literacy, and increasing access to digital solutions such as smartphones for the agents.
- Annually allocate a budget towards implementation of the system to cover continuous costs such as maintenance and data costs.
- Continuously equip/capacity build the IT personnel in charge of implementation to ensure that they are able to provide the necessary support to other staff and the agents.




To assess the digital maturity the DMA tool was filled in based on answers given and expert judgement from the IDH interviewees. For all questions, the average score given is shown in the dashboard as the result. See annex for definitions of maturity variables.

## There are key critical considerations that Afro-Kai needs to take into account to ensure successful design and implementation of the FMS.

### FMS design and implementation best practices

- 1 Understand business needs:** understanding the business needs that Afro-Kai envisions to solve at the onset helps in customizing the system to capture the crucial data points that need to be collected. For example, since Afro-Kai intends to leverage some of the data to enhance access to credit for farmers, it will be important to align with the financial providers on the data needed for credit scoring.
- 2 Create ownership both at Afro-Kai and farmer level:** there needs to be full support from the company's management team. Afro-Kai also needs a dedicated person to oversee the design and implementation of the FMS including data collection, training/ capacity building of the staff and agents. The company should also identify lead farmers/early adopters as champions to drive behavior change and enhance acceptability.
- 3 Design clear workflows/roadmap:** clearly articulate all the activities that need to be undertaken and assign responsibilities between the service provider and Afro-Kai staff involved in implementation.
- 4 Capacity building and facilitation of agents:** Success largely depends on Afro-Kai agents' ability to collect and verify data, maintain relationship with farmers and influence adoption. As such, the agents need to be well trained and equipped to implement the FMS. Particularly, Afro-Kai should provide the agents with smartphones and data bundles to facilitate onboarding.
- 5 Gender integration:** to incorporate gender into the FMS implementation, Afro-Kai should a) collect gender disaggregated data and continuously assess the data to identify trends, b) encourage women participation in initial trainings and demos, and c) ensure women participation as agents responsible for profiling and registering the farmers.
- 6 Data security and consent:** involve an external expert if needed when it comes to data security (e.g., when mobile money payments are integrated) and integrate farmers consent when sharing data with 3rd parties. Ensure adherence to the Uganda data protection Act (2019) and the guidelines (2021).
- 7 Clarity on costs:** Aside from the initial hardware and software costs, Afro-Kai should get clarity on other continuous costs such as maintenance; costs of data collection, costs for bulk SMS, training of users and additional application programming interface (API) after initial set-up to ensure these are considered in the annual budget.

# It is crucial for Afro-Kai to understand its data and decision needs across the various supply chain nodes to ensure the FMS is customised to meet those needs.

	 <b>Farmer level</b>	 <b>Agent level</b>	 <b>Afro-Kai level</b>
Business needs	<ul style="list-style-type: none"> <li>Timely communicate with farmers (market, weather information, training tips, event days etc.).</li> <li>Track production cycles/calendar and follow up of farm activity.</li> <li>Measure performance/ productivity of farmers</li> <li>Track farmer loyalty and potentially decrease side selling.</li> <li>Leverage data to inform farmer graduation/tailor services.</li> <li>Estimate demand for seed to inform FICA seeds production planning.</li> </ul>	<ul style="list-style-type: none"> <li>Gain visibility on volumes aggregated by agents to inform transport arrangements/ route planning.</li> <li>Easily forecast volumes collected per agent based on previous performance.</li> <li>Track performance of agents through the seasons/years.</li> <li>Understand training capacity (needs/ delivery).</li> <li>Leverage data to inform agent graduation/ tailor services.</li> </ul>	<ul style="list-style-type: none"> <li>Understand the capital needed to procure produce.</li> <li>Timely process payment for produce collected.</li> <li>Trace produce delivered from the agent/farmer</li> <li>Ability to link annual procurement needs to the budgets.</li> <li>Ability to leverage the FMS data to facilitate access to credit for farmers.</li> <li>Manage advances to agents and loans to farmers.</li> <li>Monitor capacity building activities of the agronomists.</li> <li>Link performance of the agents to the agronomists.</li> </ul>
Data points	<ul style="list-style-type: none"> <li>Farmer personal data</li> <li>Production data</li> <li>Farmer account (mobile, bank) details</li> <li>Contract details (crops, volumes etc.)</li> <li>Service data (Type of services received)</li> <li>Farmer group details</li> </ul>	<ul style="list-style-type: none"> <li>Agent personal data</li> <li>Agent account (mobile, bank) details</li> <li>Volumes collected per agent</li> <li>Services delivery data (e.g., seeds, fertilizers distributed)</li> <li>Farmers managed per agent</li> <li>Extension services content/plan.</li> </ul>	<ul style="list-style-type: none"> <li>Credit details (amount of loans, type of loan, repayment period etc.)</li> <li>Agronomists' extension services content/plan and status.</li> <li>Market information data e.g., prices</li> </ul>
Potential risks	<ul style="list-style-type: none"> <li>Reluctance of the farmers to share their data.</li> <li>Accuracy of the data provided/collected</li> <li>Low levels of digital literacy and mobile phone/mobile money account ownership.</li> </ul>	<ul style="list-style-type: none"> <li>Digital and financial literacy of the agents.</li> <li>Access to digital/finance solutions (e.g., mobile phones, mobile money accounts) of the agents.</li> <li>Lack of ownership /reluctance by the agents.</li> </ul>	<ul style="list-style-type: none"> <li>Ability to onboard people with the right digital skills.</li> <li>Lack of ownership by Afro-Kai staff.</li> <li>Inadequate capacity building support to staff.</li> <li>Limited budget dedicated to the digitization agenda.</li> <li>Ensuring data security.</li> </ul>



### 3. Afro-Kai Business Case

*For business sensitivity reasons, we have excluded the pages of 'Afro-Kai's business case' chapter from the report.*

## 4. FICA seeds business case

*For business sensitivity reasons, we have excluded the pages of 'FICA Seeds' business case' chapter from the report.*

# 5. Hub business case

*For business sensitivity reasons, we have excluded the pages of 'Hub business case' chapter from the report.*

# 6. Agent business case

## The network of 112 agents in the service delivery model potentially segmented into super and normal agents perform a critical role in service delivery and off-take.

### Key activities undertaken

- 1 AKL works with agents to mobilise, sensitize, register farmers and facilitate group formation.
- 2 The agents work closely with the AKL's agronomists to deliver trainings on GAP. For this the agents are required to set up demo farms and conduct Farmer Field School.
- 3 Distribute inputs – seeds, fertilizers and pesticides to the farmers. And create awareness of other services such as mechanization, drying and cleaning delivered in the hubs.
- 4 Continuously monitor the farmer and the crops and conduct spot visits to ensure good practices are being applied all through the season.
- 5 After harvest, they aggregate the grain at their stores until Afro-Kai picks or delivers the grain directly to the hubs.
- 6 Agents pay the farmer upon delivery of the produce and are paid by Afro-Kai once produce is delivered to the hubs.
- 7 The agents are also expected to play a crucial role in the implementation of the FMS by collecting, validating data and registering farmers.

### Selection criteria\*

Afro-Kai has established the below agent selection criteria. The criteria could be enhanced to also include gender consideration.



\*5% points are also given per individual after physical sight

# Afro-Kai's agent base consists of agents who manage up to 30 farmers on average and who might be motivated enough and sufficiently trained to become a super agent.

## DESCRIPTION

Indication of agent behaviour and loyalty

### NORMAL AGENT

- Farmer, part of the SDM, who applies GAP and is member of a farmer group.
- Besides farming, the person performs agent activities with up to 30 farmers: sourcing volume, training farmers, and acquiring more farmers.
- The Agent has [similar characteristics as the medium size farmer](#).

### SUPER AGENT

DEPENDENT ON [GRADUATION](#) OF THE NORMAL AGENT

## FINANCIALS

Financial performance enablers from Afro-Kai

- Agri – business training
- Sales commission: 30 UGX/kg grain
- Other commission: 500 UGX/kg certified seed

## FARMER BASE

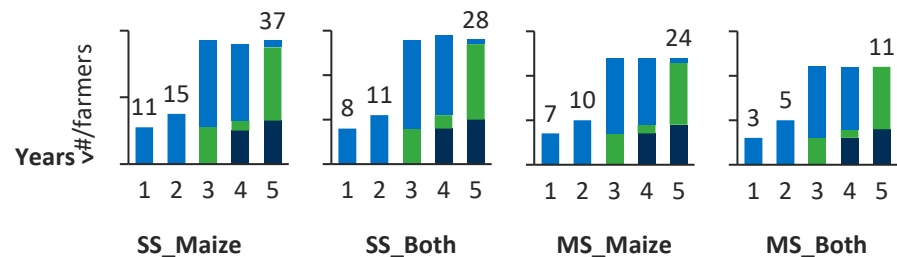
Sourcing farmer base per agent

Farmer/Year	2022	2023	2024	2025	2026
	30	40	100	100	100

## GRADUATION

Farmer [\[segmentation\]](#) and [\[graduation\]](#) follows logic outlined

- Star 1 farmer
- Star 2 farmer
- Star 3 farmer



# AKL should develop an agent graduation trajectory that incentivizes the agents to perform at a higher level ultimately enhancing efficiency of the sourcing model (1/2).

## Segment

Define minimum criteria based on which a selection of agents can be onboarded onto the Agent Development Program. At the start of each performance improvement cycle (annual or once every two years), agents can be segmented by assessing the level of member loyalty and level of professionalism. Such a segmentation allows Afro-Kai to plot agents on the Agent Maturity Track and forms the starting point of the graduation path for each participating agent.

## Support

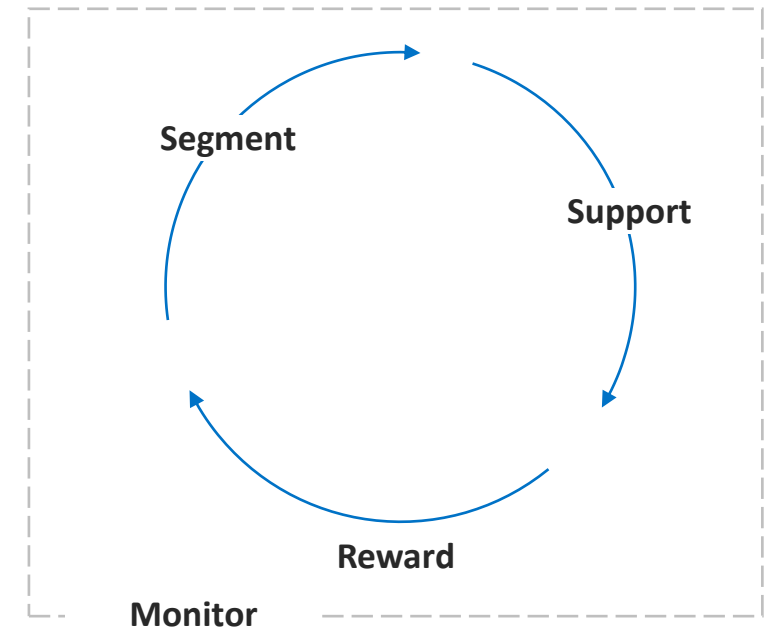
Each graduation step on the path to maturity comes with additional support from Afro-Kai to the agent. The type of support is focussed on preparing the agent to make the next step on the maturity track towards the Mature segment.

## Reward

We believe that the best way to reward for becoming a more effective business partner is financially and we propose several financial incentives for Afro-Kai to consider.

This is to be complemented by symbolic reward in the form of recognition of performance.

## Monitor



To effectively monitor and manage the graduation trajectory, Afro-Kai should collect and provide sufficient data on agent and farmer performance to evaluate an agent's performance.

# AKL should develop an agent graduation trajectory that incentivizes the agents to perform at a higher level ultimately enhancing efficiency of the sourcing model (2/2).



FARMER BASE



QUALITY



TRANSPORT



STORAGE



PRE-FINANCE



AGENT BASE

## Farmer-level

### Segmentation consideration

- Determine the number of farmers (groups) an agent can feasibly train and monitor.
- Evaluate the sourcing volume to become available from these mobilized farmers.

### Support consideration

- Provide training to ensure agents are well equipped to train farmers on GAP, entrepreneurship, and ethics.

## Agent-level

### Segmentation consideration

- Evaluate agent's ability to assess grain quality and ownership of required equipment
- Evaluate transportation capacity to manage volumes from the farmer base to the agent's facility the Hub.
- Evaluate storage capacity to shortly hold grain before transportation.
- Assess the development of sourcing value and ability to pre-finance the sourcing

### Support consideration

- Provide quality assessment equipment.
- Link agents to transportation networks / platforms.
- Link and mobilize agents around hubs to shorten supply distances and enable storage
- Provide a revolving finance facility for agents to utilize

## Afro-Kai level

### Reward considerations

- Evaluate a balance between onboarding cost (training) and recurring cost (commission) to manage cost.
- Determine the level of autonomy, sourcing volume, and financial exposure per agent

### Monitoring consideration

- Embed agents as a unit in the farmer management system and ensure they have [access to pivotal data points](#).

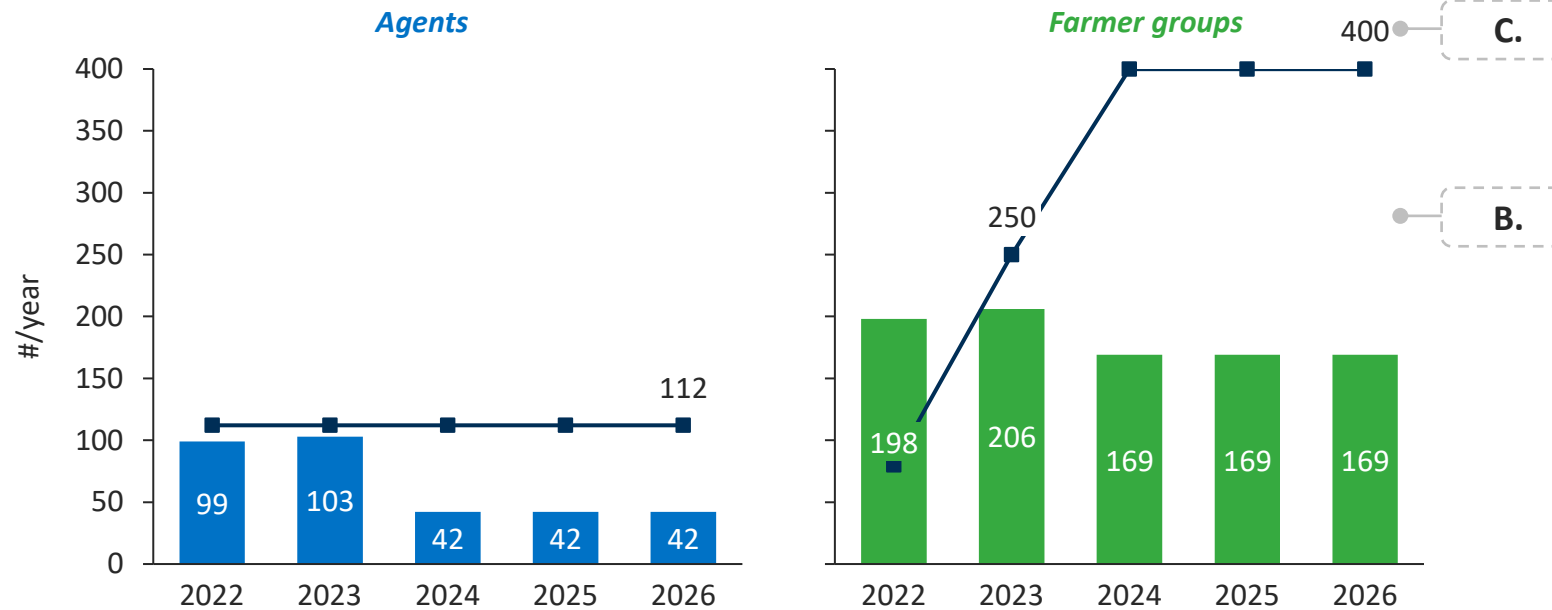


# Afro-Kai requires fewer agents and farmer groups to achieve their annual sourcing target. The storage, working capital and farmer management capacity however needs to be critically examined.

Comparison of required to targeted number of agents and farmer groups for 2022 – 2026

#/year

Required number (green bars) Project target number (black line)



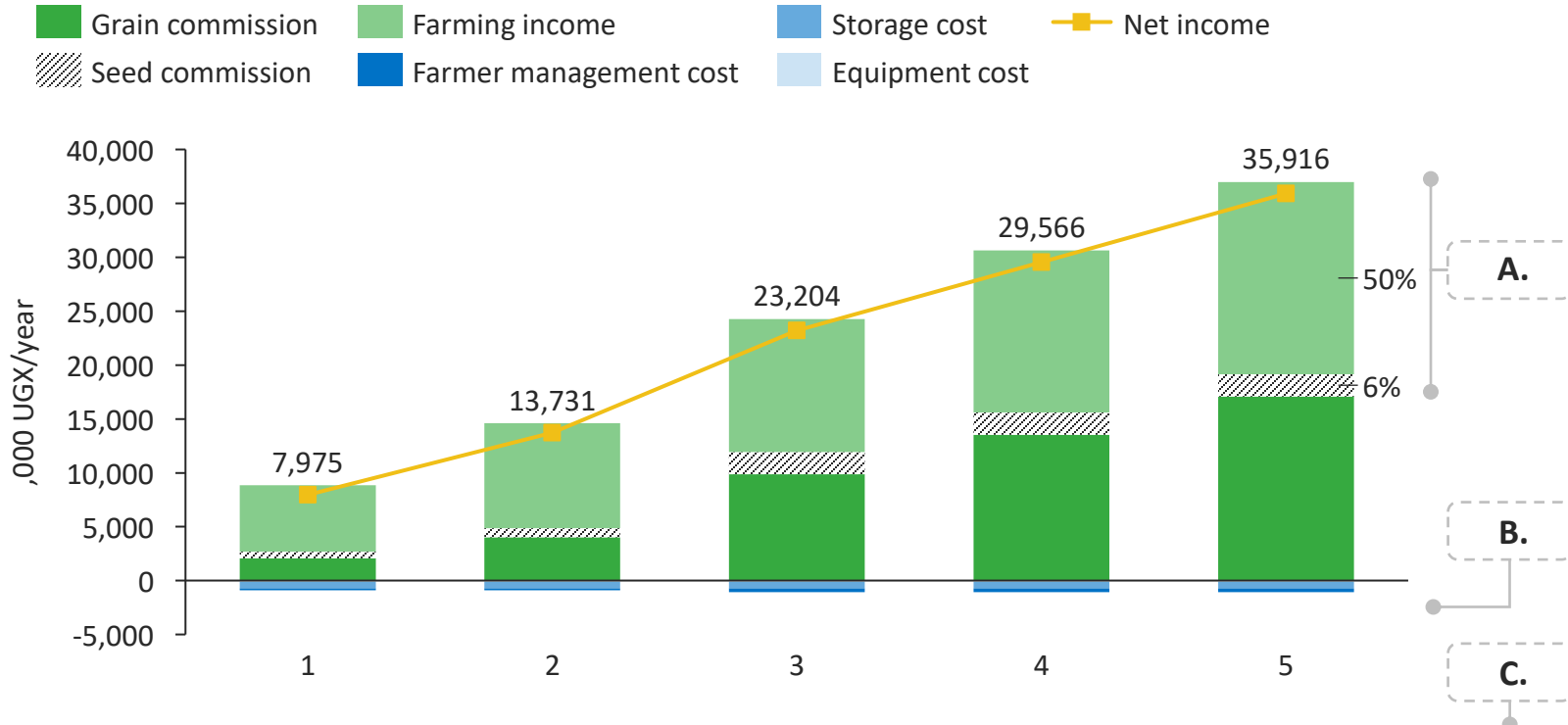
- A. Based on the assumption of each agent eventually (by 2026) managing 4 farmer groups each consisting of 25 farmers, Afro-Kai requires less than half of the number of agents it has projected for [its sourcing model](#).
- B. Besides, with farmer groups increasing in size and professionalism as a result of governance/finance training, Afro-Kai requires less than half of the number of farmer groups it has projected for [its sourcing model](#).
- C. However, increasing the number of farmers, farmer groups and [volume to be managed](#) by each agent might go beyond their capacity. Hence, AKL needs to critically assess the volume and farmer management capacity of the agents and farmer groups they work with.

	2022	2023	2024	2025	2026
Groups/agent	2	2	4	4	4
Farmers/group	15	20	25	25	25

# Farmers who become an agent for Afro-Kai are able to, after five years, outperform their farming income with additional income from agent activities.

Annual income from farming and other agent activities 2022 – 2026

,000 UGX/year



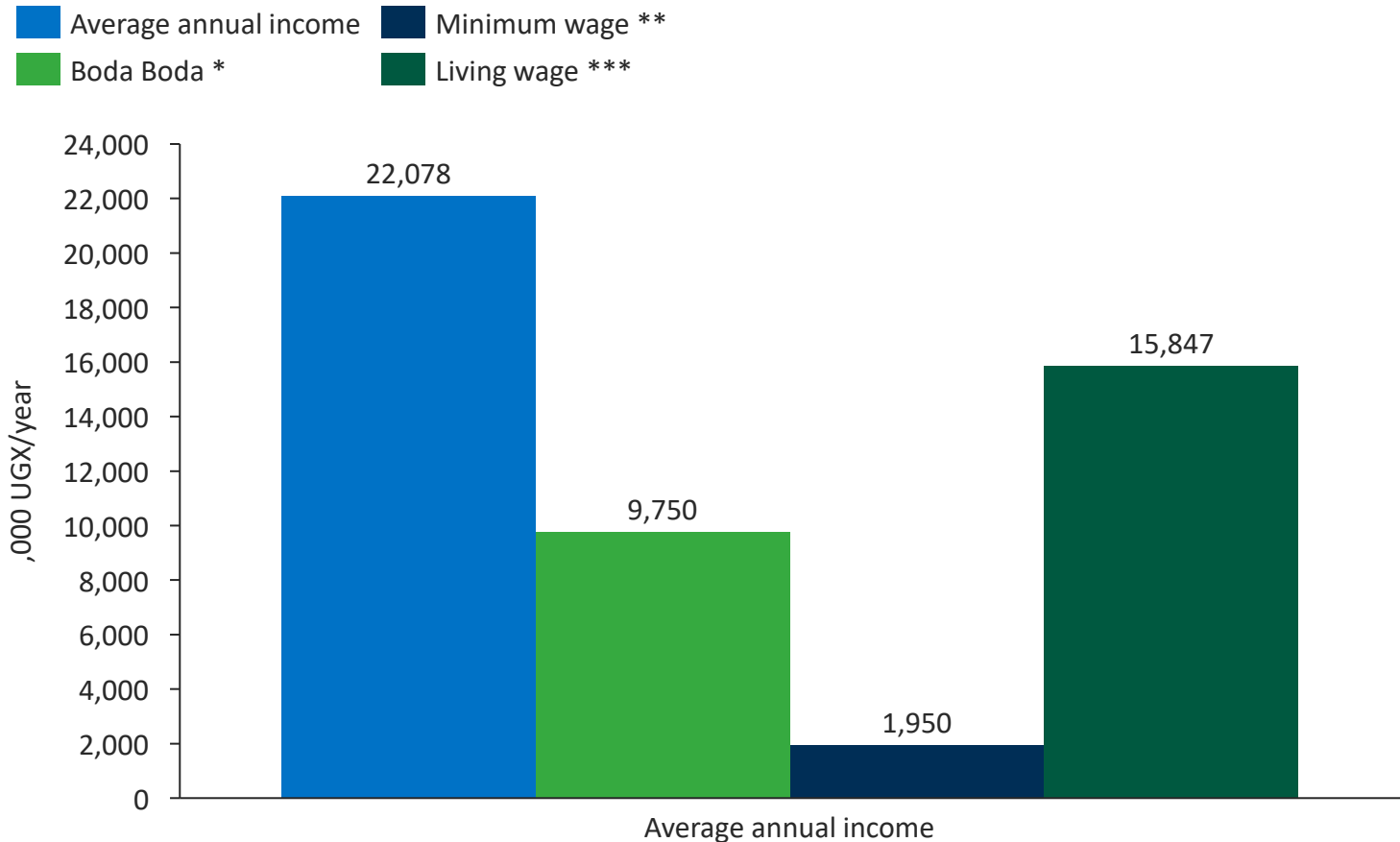
- A. Farmers who become an agent for Afro-Kai can more than double (+56%) their annual income after five years.
- B. The cost of performing agent activities remains at a minimum level as agents only bear cost of farmer management (mobilization and training) and storage.
- C. Agent are projected to increase the volume and value of grain they manage by 700%. This volume and value is expected to be beyond current agents' capabilities of infrastructure and working capital.

Sorghum volume	20	35	80	110	130	Mt/year
Maize volume	50	100	250	350	450	Mt/year
Sourcing value	70	135	330	450	570	M UGX/year

## Becoming an agent for Afro-Kai is projected to be a competitive occupation against other income generating activities such as boda boda operations or performing off-farm labour.

Income comparison between Agent and other professions (5 year average)

,000 UGX/year



- A. Becoming an agent for Afro-Kai is projected to be a competitive occupation against other main income generating activities taken up by most youths in Uganda.
- B. However, for an accurate comparison, it is important to assess what labour, cash, and assets are required to start each of the activities. This comparison will inform whether being an agent, performing labour and boda boda, and farming activities are exclusive or whether there are possibilities to diversify income by performing part of each activity.

NOTE: \* [Monitor Team \(2021\)](#); Boda boda operation is one of the main income generating activities taken up by the youth in Uganda. \*\* [Minimum Wage.org \(2022\)](#); \*\*\* [Wage Indicator \(2019\)](#)

## Afro-Kai needs to determine an efficient and effective balance between their sourcing targets, the number of agents to operate, and the capacity of each agent to operate a given farmer/sourcing volume.

### Sensitivity analysis on number of agents (5-year average)

#/year

#/farmer/agent	Sourcing volume of sorghum and maize combined (Mt/year)									
	2,750	5,500	8,250	11,000	13,750	16,500	19,250	22,000	24,750	27,500
10	73	146	218	291	364	437	510	582	655	728
20	36	73	109	146	182	218	255	291	328	364
40	18	36	55	73	91	109	127	146	164	182
60	12	24	36	49	61	73	85	97	109	121
80	9	18	27	36	45	55	64	73	82	91
100	7	15	22	29	36	44	51	58	66	73
120	6	12	18	24	30	36	42	49	55	61
140	5	10	16	21	26	31	36	42	47	52
160	5	9	14	18	23	27	32	36	41	45
180	4	8	12	16	20	24	28	32	36	40
200	4	7	11	15	18	22	25	29	33	36
220	3	7	10	13	17	20	23	26	30	33

- A. Based on a 5-year average, to achieve Afro-Kai’s [sourcing target of 15,000 Mt maize and 1,500 Mt sorghum](#), the business requires approximately **[44]** agents, who each manage 100 farmers (500 Mt grain/agent\*), with this number more than **doubling [109]** if each agent operates 40 farmers (200 Mt/agent\*) and reducing to **half [22]** the number if each agent operates 200 farmers (1,000 Mt/agent\*).

NOTES: \* The sensitivity analysis assumes a 5-year average farmer productivity of **5.0 Mt/farmer** (see assumptions).

# 7. Farmer business case

# The survey of maize and sorghum farmers established four distinct segments based on land size and crop combination; over 65% of the farmers are small scale farmers with an average of 3 acres.

## DESCRIPTION

Indication of farmer behaviour and loyalty

## LAND-SIZE

Available land-size and crops cultivated

## CULTIVATION

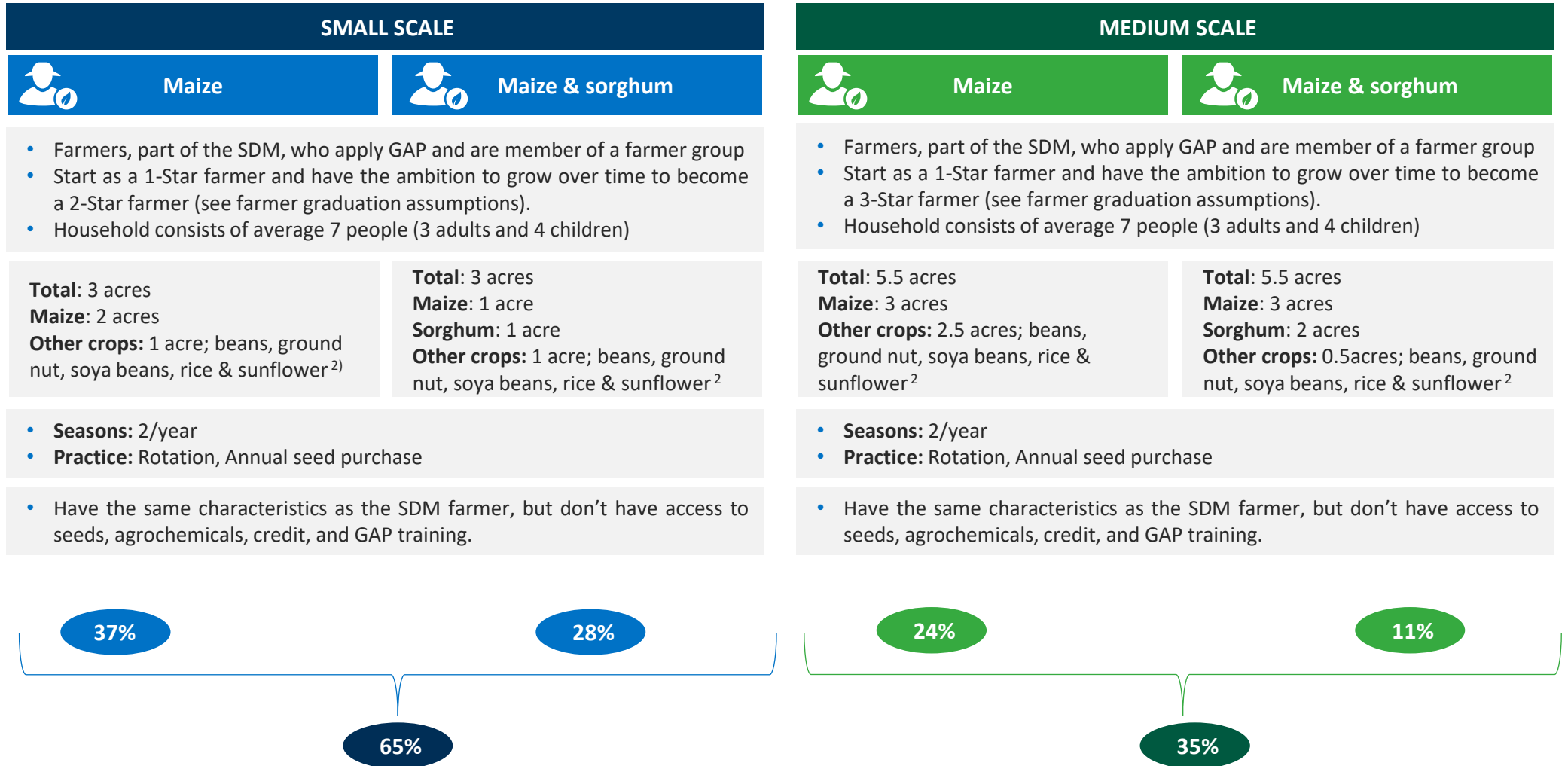
No. of seasons /practises

## BASELINE

Indication of farmer behaviour and loyalty



## REPRESENT <sup>1)</sup>

% representing total of farmer base per 2022



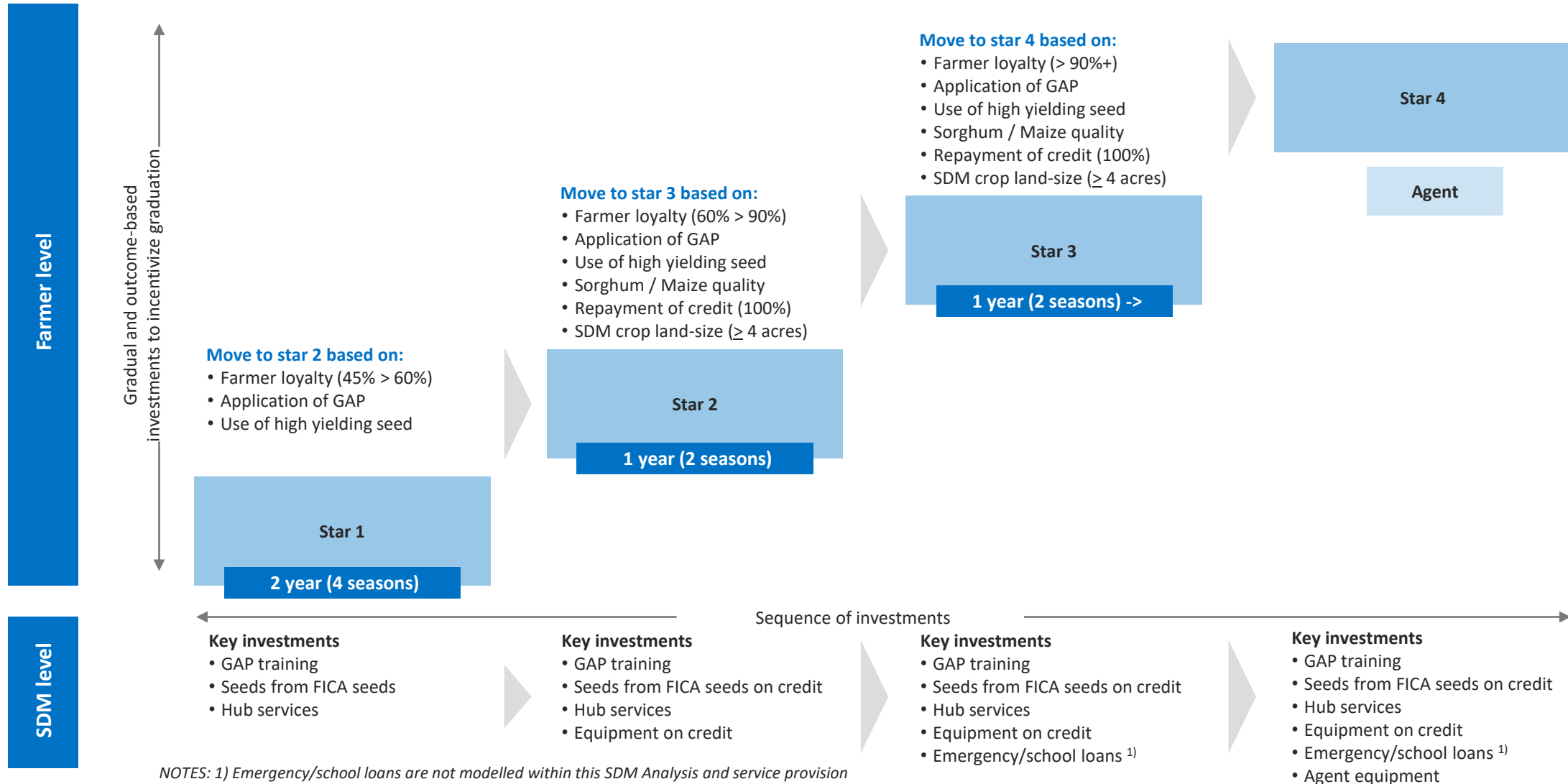
NOTES: 1) Representation determined on cohort analysis from PDC data and confirmed with Afro-Kai 2) For more detailed analysis on 'other crops', see [here]; 3) For more farm-level assumptions, see [here];

# The survey of potato farmers on the other hand established two farmer segments based on land size; most of the farmers are medium scale with an average of 5.5 acres of land.

	SMALL SCALE	MEDIUM SCALE
<b>DESCRIPTION</b> <i>Indication of farmer behaviour and loyalty</i>	<ul style="list-style-type: none"> <li>Farmers, part of the SDM, who apply GAP and purchase high yielding seeds every season.</li> <li>Household consists of average 7 people (3 adults and 4 children)</li> </ul>	<ul style="list-style-type: none"> <li>Farmers, part of the SDM, who apply GAP and purchase high yielding seeds every season.</li> <li>Household consists of average 7 people (3 adults and 4 children)</li> </ul>
<b>LAND-SIZE</b> <i>Available land-size and crops cultivated</i>	<p><b>Total:</b> 2 acres  <b>Potatoes:</b> 2 acres  <b>Other crops:</b> N/A</p>	<p><b>Total:</b> 5.5 acres  <b>Potatoes:</b> 3 acres  <b>Other crops:</b> 2.5 acres; maize, beans, bananas</p>
<b>CULTIVATION</b> <i>No. of seasons /practises</i>	<ul style="list-style-type: none"> <li><b>Seasons:</b> 2/year</li> <li><b>Practice:</b> Rotation, Annual seed purchase</li> </ul>	<ul style="list-style-type: none"> <li><b>Seasons:</b> 2/year</li> <li><b>Practice:</b> Rotation, Annual seed purchase</li> </ul>
<b>BASELINE</b> <i>Indication of farmer behaviour and loyalty</i>	<ul style="list-style-type: none"> <li>Have the same characteristics as the SDM farmer, but don't have access to seeds, credit, agrochemicals and GAP training.</li> </ul>	<ul style="list-style-type: none"> <li>Have the same characteristics as the SDM farmer, but don't have access to seeds, credit, agrochemicals and GAP training.</li> </ul>
<b>REPRESENT <sup>1)</sup></b> <i>% representing total of farmer base per 2022</i>		

NOTES: 1) Representation determined on cohort analysis from PDC data and confirmed with Afro-Kai 2) The PDC captures data for only 26 potato farmers

# By implementing a farmer graduation model, Afro-Kai can incentivize farmers to stay loyal and secure more grain volumes, while increasing the income of the farmers they work with.

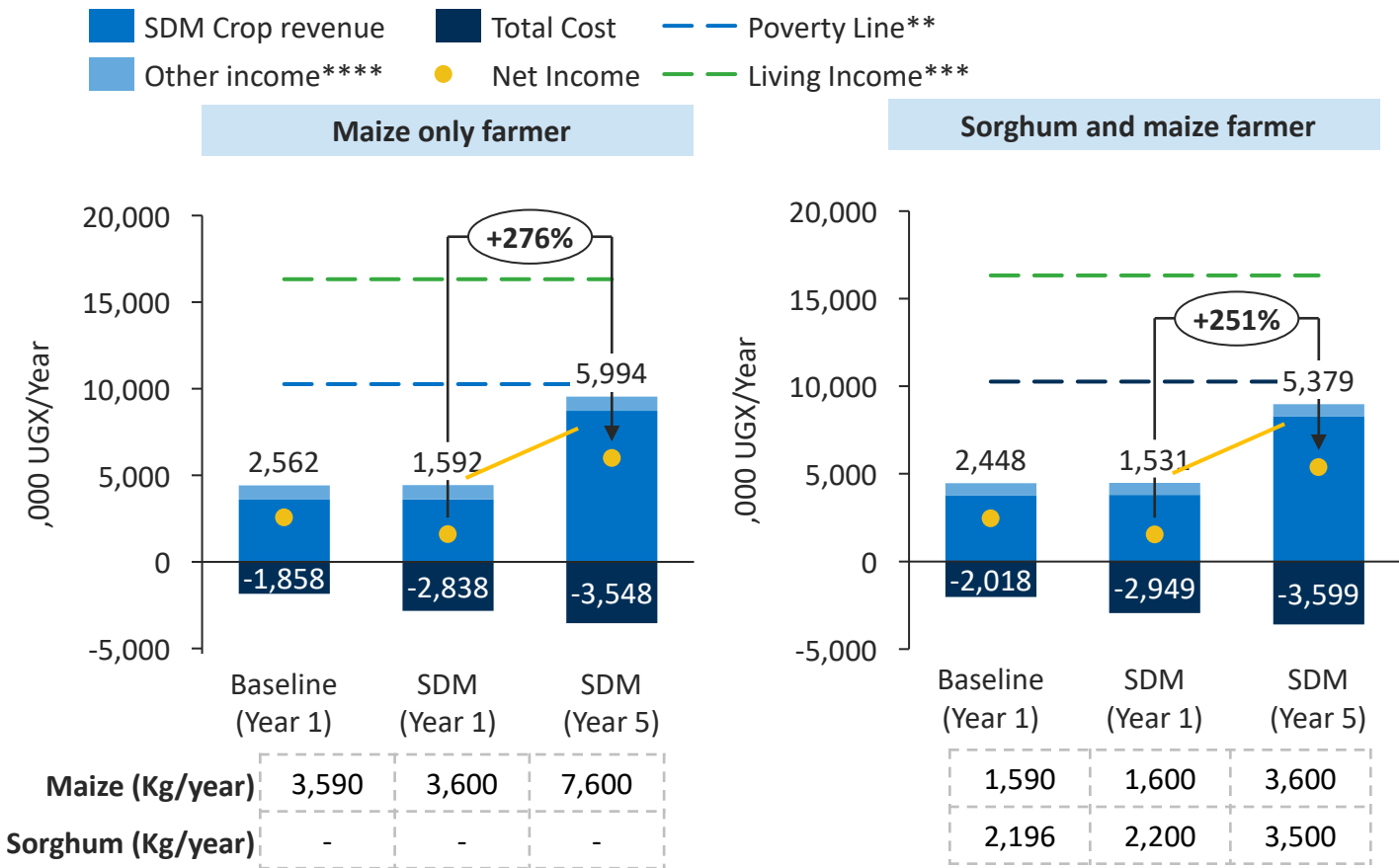


NOTES: 1) Emergency/school loans are not modelled within this SDM Analysis and service provision



# Both SDM small scale farmer segments are projected to more than double their net income within five years through the adoption of good agricultural practices, use of inputs and reduction of post-harvest losses.

## Income analysis for small scale maize and sorghum farmers segments SMALL SCALE ,000 UGX/year



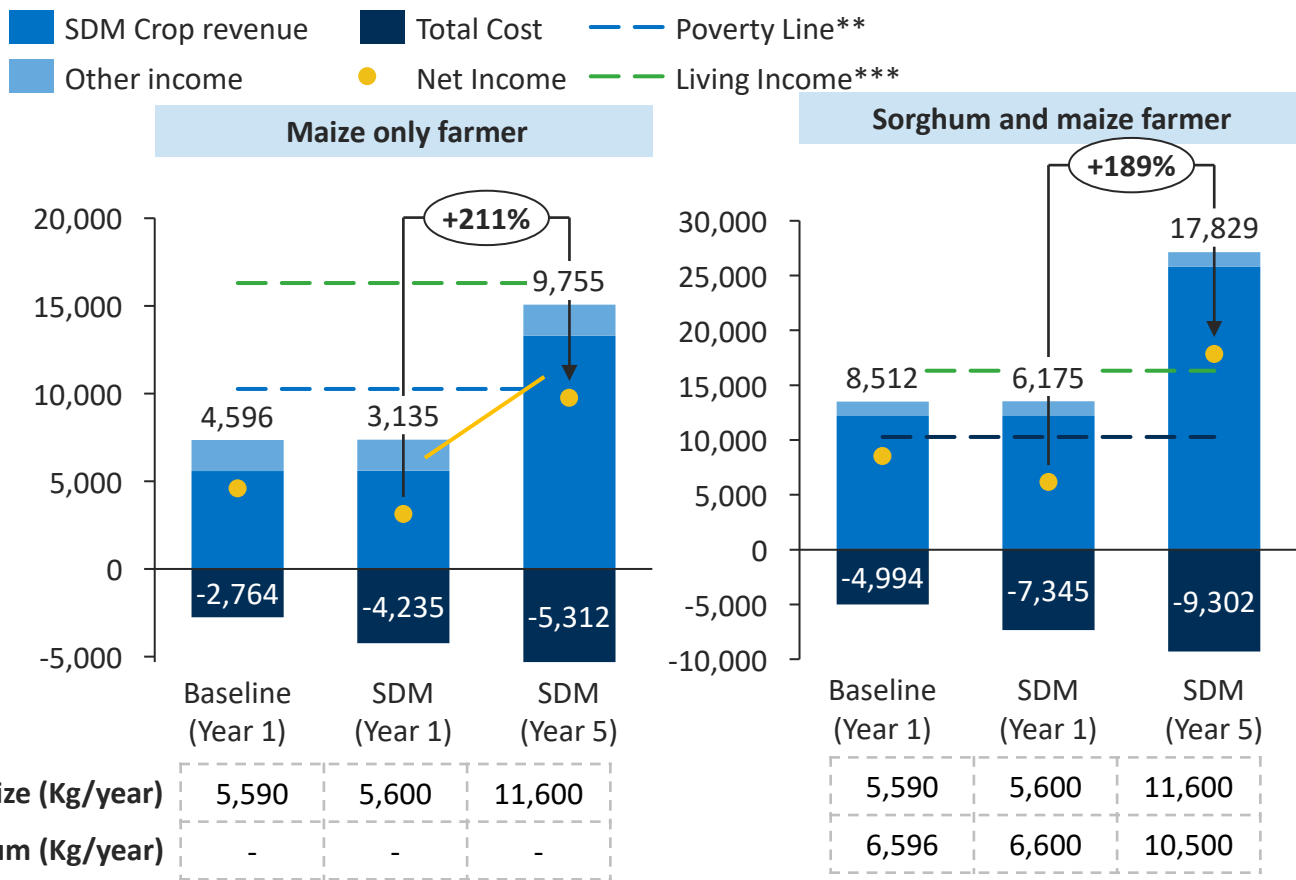
- A. Compared to the baseline farmers, the net income of the SDM farmers is estimated to grow by **over 250% by the 5<sup>th</sup>** year.
- B. Farmers in the SDM are able to **more than double their marketable surplus** within 5 years with the application of good agricultural practices and better post-harvest management techniques provided to them.
- C. The living income gap for the SDM maize only farmer reduces from **90%** in year 1 to **63%** in year 5 while that of the SDM both farmer reduces from **91%** in year 1 to **67%** in year 5.
- D. Small scale farmers cultivating only maize have **higher incomes** compared to those cultivating both maize and sorghum. This is due to higher cost of production in sorghum production. These farmers are however more vulnerable to climate risks as sorghum is more drought resistant compared to maize.<sup>1</sup>

NOTES: \* Quantity in Kg/year; \*\* Data on poverty line is obtained from [World Bank \(2022\)](#); \*\*\* The Living Income (LI), see [Shift \(2022\)](#), is an approximate income needed to meet a family's basic needs including food, housing, transport, health, education, tax deductions and other necessities. The difference between the LI benchmark and actual income is referred to as the living income gap. The living income benchmark depicts a typical family of Seven members (3 adults and 4 children).

\*\*\*\*Other income includes; income from other crops, income from livestock and income from farm labor and non-labor activities. 1) [Hasan et al. \(2017\)](#)

# Similarly, SDM medium scale farmers are projected to more than double their net income within five years through the adoption of good agricultural practices, use of inputs and reduction of post-harvest losses.

**Income analysis for medium scale maize and sorghum farmer segments** MEDIUM SCALE ,000 UGX/year



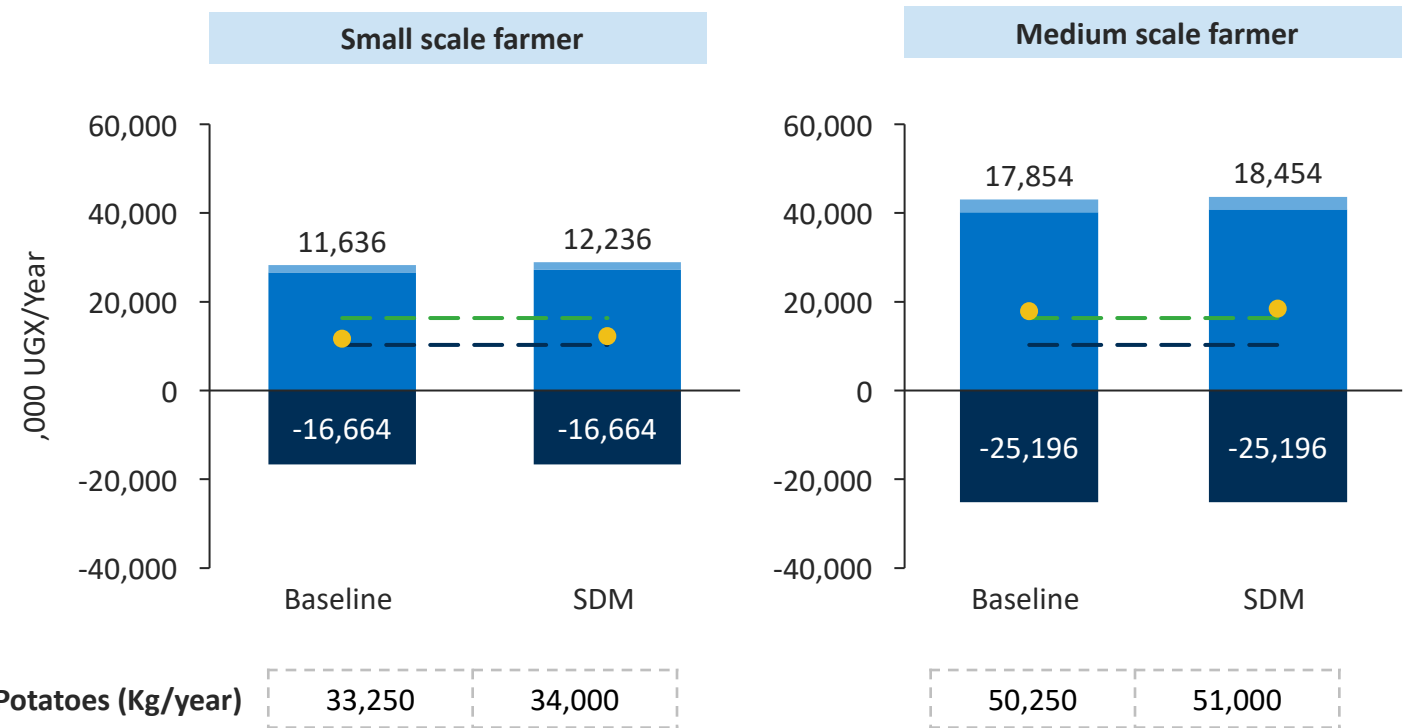
- A. Compared to the baseline farmers, the net income of the SDM farmers is estimated to grow by **an average of 200% by the 5<sup>th</sup> year.**
- B. Farmers in the SDM are able to **more than double their marketable surplus** within 5 years with the application of good agricultural practices and better post-harvest management techniques provided to them.
- C. The living income gap for the SDM 'maize only' farmers reduces from **81%** in year 1 to **40%** in year 5. While the living income gap is closed by year 5 for the medium scale farmer cultivating both maize and sorghum.

NOTES: \* Quantity in Kg/year; \*\* Data on poverty line is obtained from [World Bank \(2022\)](#); \*\*\* The Living Income (LI), see [Shift \(2022\)](#), is an approximate income needed to meet a family's basic needs including food, housing, transport, health, education, tax deductions and other necessities. The difference between the LI benchmark and actual income is referred to as the living income gap. The living income benchmark depicts a typical family of Seven members (3 adults and 4 children). \*\*\*\*Other income includes; income from other crops, income from livestock and income from farm labor and non-labor activities.

# While margins per kg of produce for potato farmers are generally lower than those for maize and sorghum farmers, margins per acre are higher for potato farmers due to higher yield per acre.

## Income analysis for small and medium scale farmers cultivating Potatoes POTATO ,000 UGX/year

■ SDM Crop revenue    ■ Total Cost    — Poverty Line\*\*  
■ Other income\*\*\*\*    ● Net Income    — Living Income\*\*\*



- A. The net income of the baseline farmer is very close to the net income of the SDM farmer. The slight difference in income is attributed to the use of part of the produce as seed for the next season by the baseline farmer.
- B. The living income gap for the small scale potato SDM farmer is **25%** while the living income gap is closed for the medium scale farmers.
- C. Cost of production is majorly driven by the cost of inputs which accounts for **72%** of the total cost of production. More specifically, the cost of seed is **58%** of the entire cost of production. Labour accounts for **about 23%** of the entire cost of production.

NOTES: \* Quantity in Kg/year; \*\* Data on poverty line is obtained from [World Bank \(2022\)](#); \*\*\* The Living Income (LI), see [Shift \(2022\)](#), is an approximate income needed to meet a family's basic needs including food, housing, transport, health, education, tax deductions and other necessities. The difference between the LI benchmark and actual income is referred to as the living income gap. The living income benchmark depicts a typical family of Seven members (3 adults and 4 children). \*\*\*\*Other income includes; income from other crops, income from livestock and income from farm labor and non-labor activities.

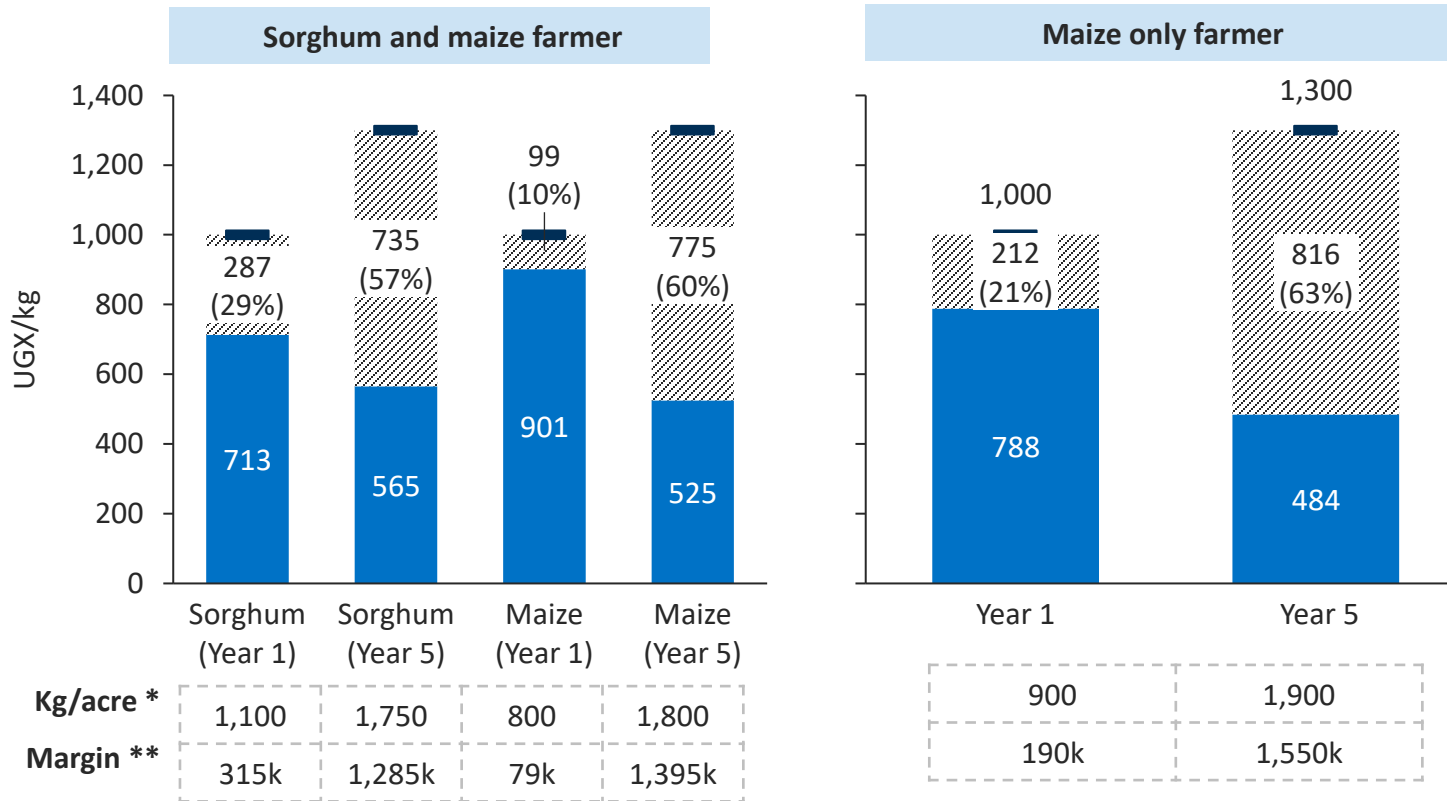
# Farmers in the SDM are projected to increase margins on their produce as they uptake value addition services provided through the hub thus fetching higher prices (1/2).

## Margins per Kg crop for small scale farmers

SMALL SCALE

UGX/kg

Margin Sales price Cost of production



- A. Maize only farmers have higher margins compared to farmers cultivating both maize and sorghum. This is attributed to higher profitability of maize compared to sorghum.
- B. Sorghum has a slightly higher total cost of production compared to maize due to additional hired labour activities such as bird scaring which are not present for the maize farmer.
- C. For the maize only farmer, productivity increases by **111% within five years**. For a farmer cultivating both crops, sorghum productivity increases by **59%** while the productivity of maize increases by **125%** within five years. This contributes to the growth in margins per crop as shown in the graph.
- D. Higher Margins in Year 5 are also due to higher prices the farmers are able to fetch as a result of processing their grain through Afro-Kai at the hub level.

NOTES: \* Kg/acre refers to the marketable surplus a farmer has of that particular crop per acre/season; \*\* Margin refers to the margin in UGX/acre/season  
Sorghum and maize are cultivated on a rotational basis across the seasons with maize typically being grown in the first season and sorghum in the second season.

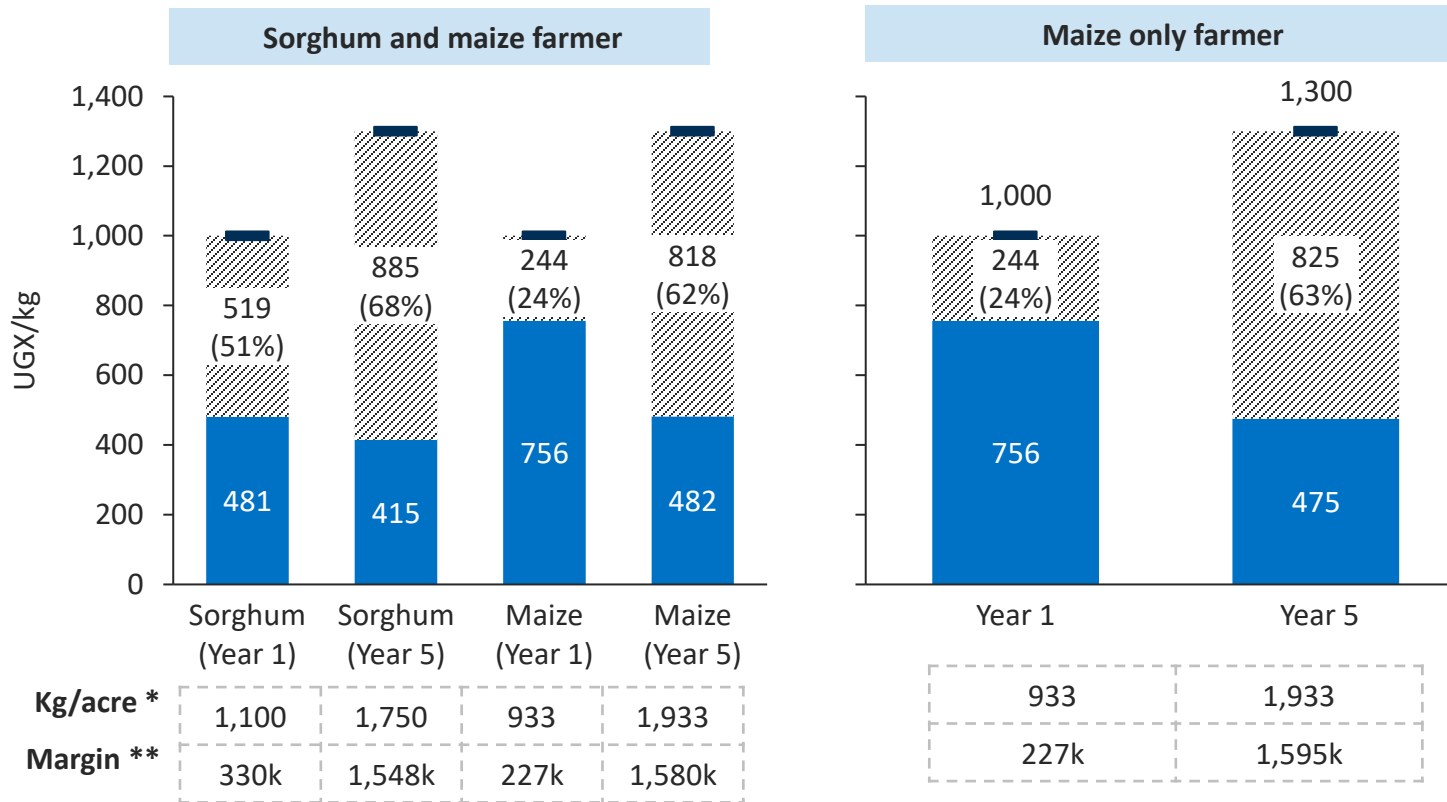
## Farmers in the SDM are projected to increase margins on their produce as they uptake value addition services provided through the hub thus fetching higher prices (2/2).

### Margins per Kg crop for medium Scale farmers

MEDIUM SCALE

UGX/kg

Margin Sales price Cost of production



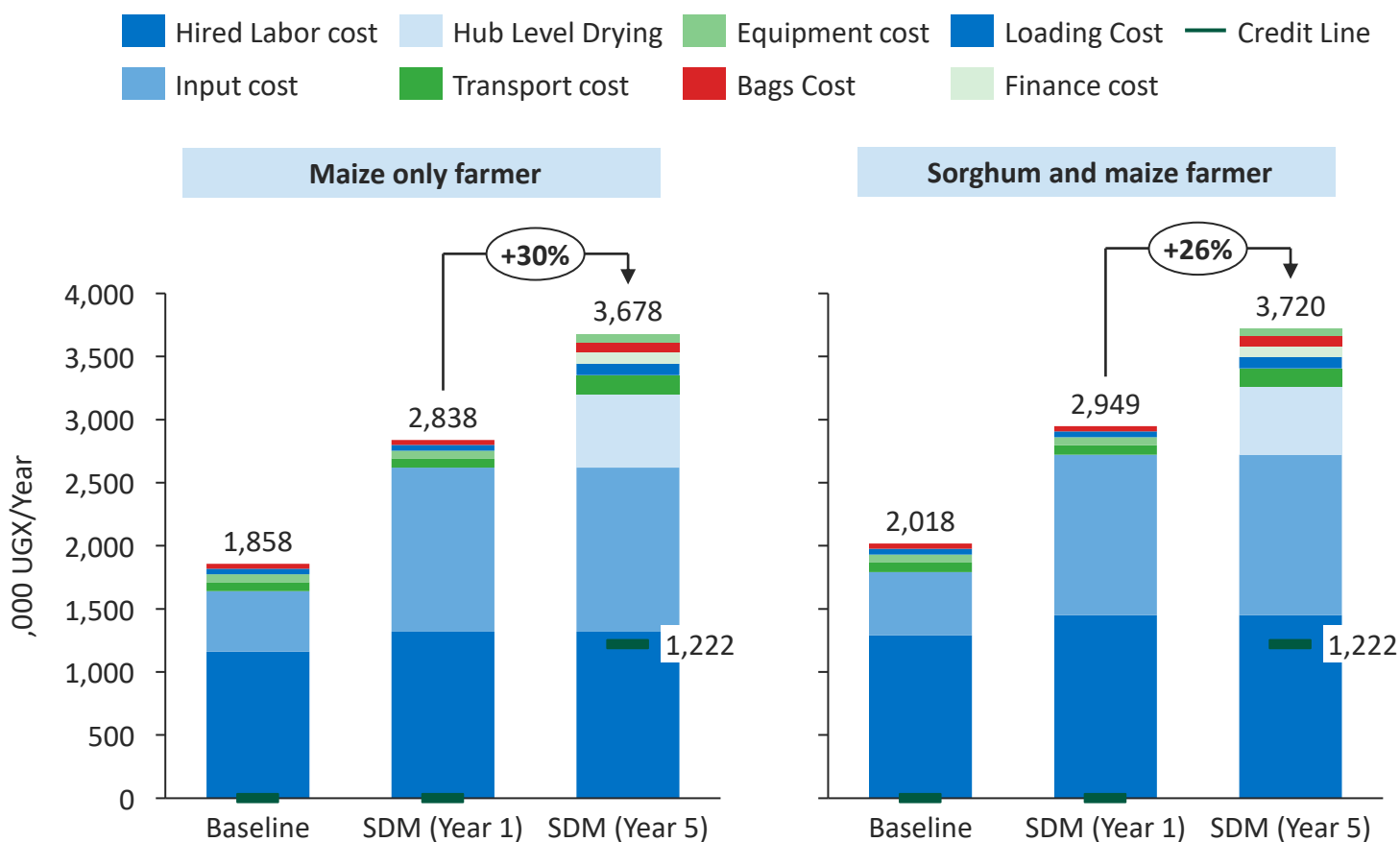
- A. Farmers producing sorghum and maize have higher margins compared to maize only farmers. This is primarily due to the [crop combination on the same size of land across the two segments](#).
- B. Sorghum has a slightly higher total cost of production compared to maize due to additional hired labour activities such as bird scaring which are not present for the maize farmer.
- C. Margins are mainly driven by higher yields with productivity increasing **by 107% for maize and 59% for sorghum** by the fifth year.
- D. Higher Margins in Year 5 are also due to higher prices the farmers can fetch as a result of processing their grain through Afro-Kai at the hub level

NOTES: \* Kg/acre refers to the marketable surplus a farmer has of that particular crop per acre/season; \*\* Margin refers to the margin in UGX/acre/season  
Sorghum and maize are cultivated on a rotational basis across the seasons with maize typically being grown in the first season and sorghum in the second season.

## Farmers cultivating both crops have slightly higher costs of production compared to farmers cultivating only maize. This is due to the additional hired labor activities required in the cultivation of sorghum (1/2).

### Cost of production for small scale farmers

UGX/year



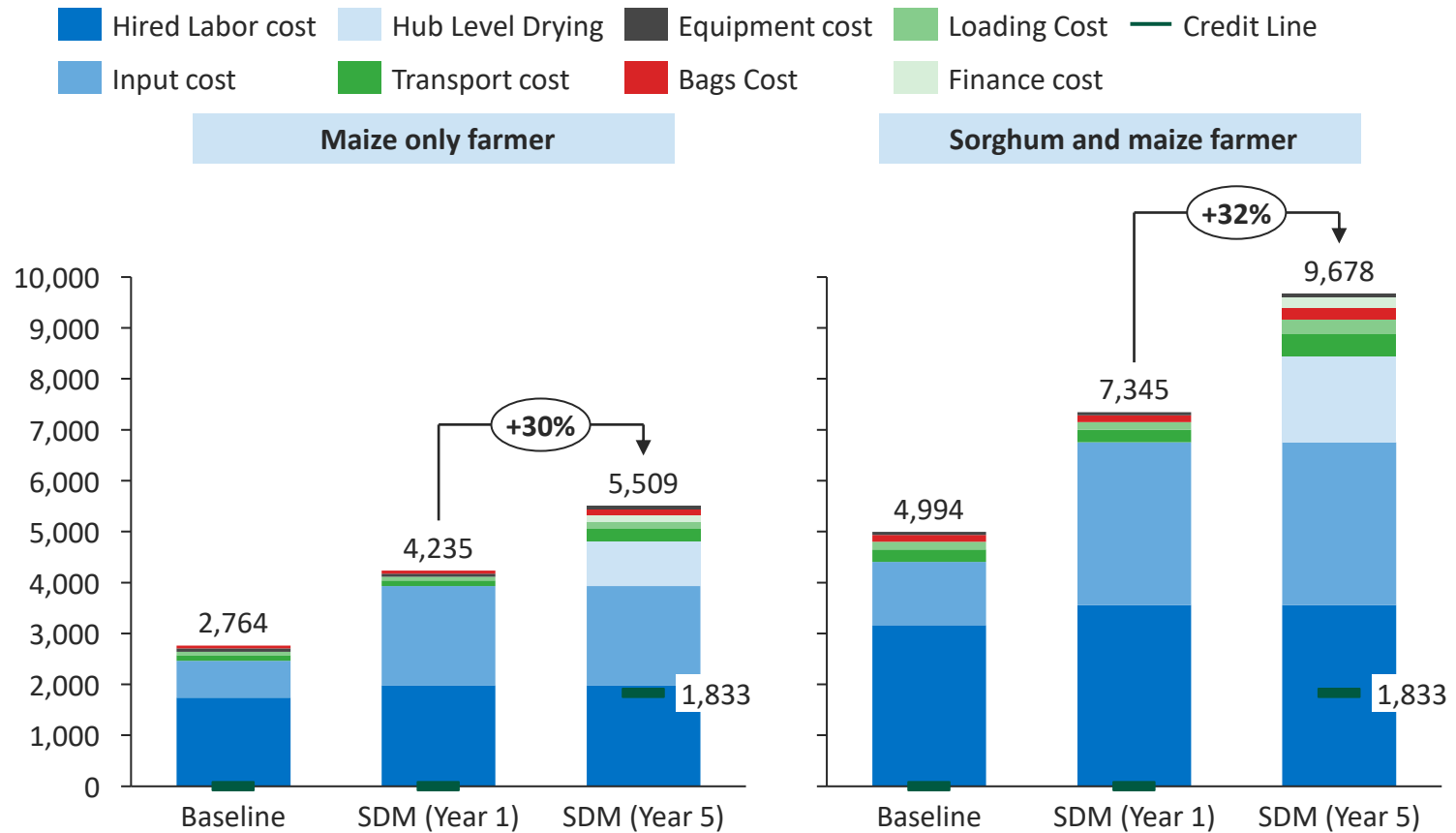
- A. The cost of production is driven by hired labour and inputs which averages **36% and 35%** respectively for both farmer segments. Fertilizer is the largest proportion (**55%**) of the input cost.
- B. Weeding and land preparation account for the highest proportion of hired labour **at 22% and 15%** respectively. 50% of total labour is provided by the household.
- C. SDM farmers are projected to increase their production costs by an average of **28%** between Year 1 and Year 5 to cater for the cost of drying grain at the hub level, finance cost and corresponding increase in the cost of logistics associated with increased production.
- D. Costs of production between the SDM farmer and the baseline farmer are distinguished by the cost of fertilizer and seed with the former presumed to be incurring higher costs for the inputs.

Notes: \*Labour includes both hired labour and family labour. Based on the graduation matrix, farmers are eligible to a credit line from their third year in the SDM. The difference in the cost increase between the small-scale farmer and the medium scale farmer between Year 1 and Year 5 is attributed to the changes in the cost of mechanization.

## Farmers cultivating both crops have slightly higher costs of production compared to farmers cultivating only maize. This is due to the additional hired labor activities required in the cultivation of sorghum (2/2).

### Cost of production for Medium Scale Farmers

UGX/year



- The cost of production for medium scale farmers is also driven by hired labour (**36%** of total cost) and inputs (**34%** of total cost). Fertilizer is the largest **proportion (56%)** of the input cost.
- Cost for SDM farmers increases by an average of **31%** between Year 1 and Year 5 to cater for the cost of drying grain at the hub level, finance cost, and corresponding rise in the cost of logistics associated with increased production.
- Costs of production between the SDM farmer and the baseline farmer are distinguished by the cost of fertilizer and the cost of seed with the former presumed to be incurring higher costs for the inputs.

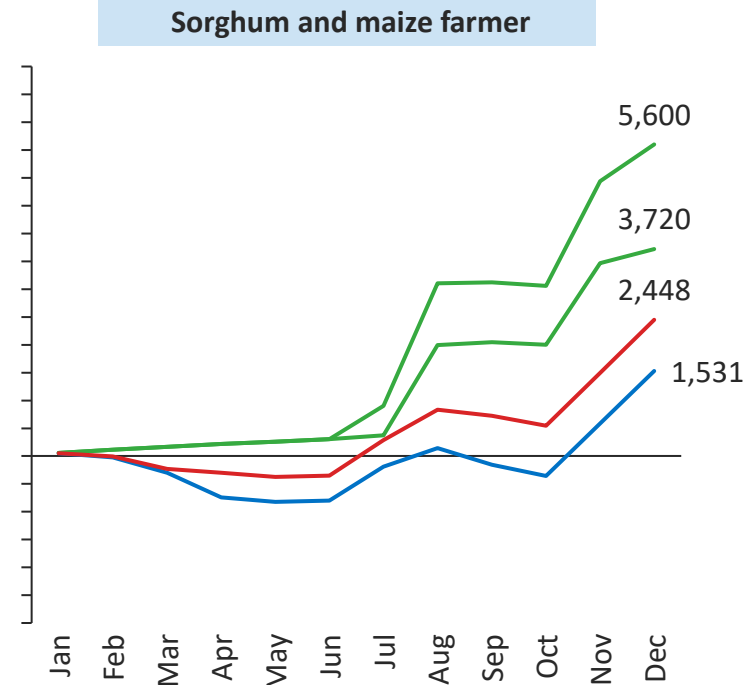
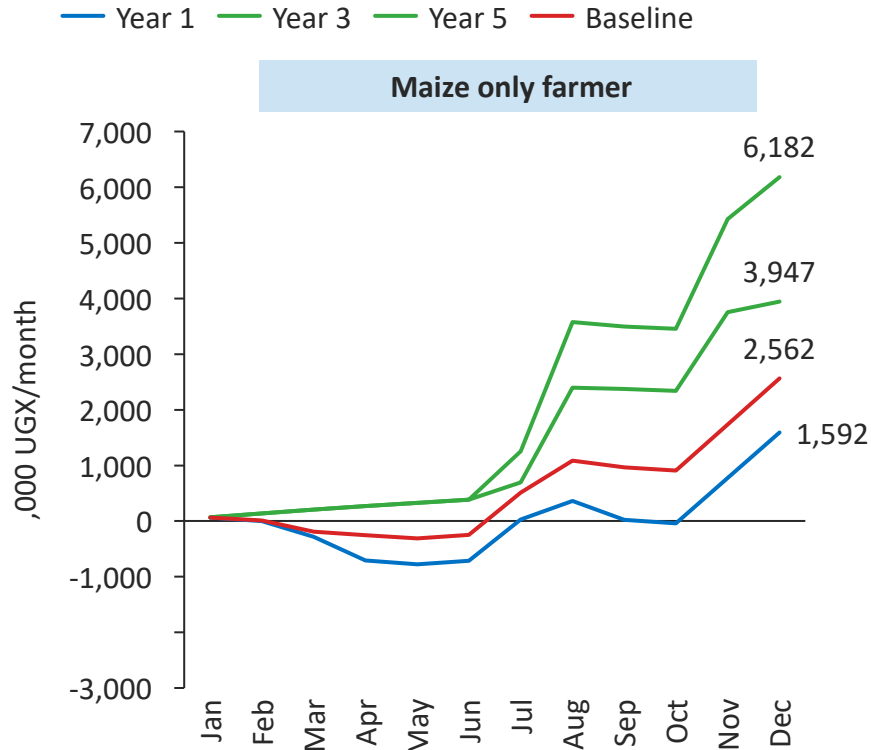
Notes: \*Labour includes both hired labour and family labour. Based on the graduation matrix, farmers are eligible to a credit line from their third year in the SDM. The difference in the cost increase between the small scale farmer and the medium scale farmer between Year 1 and Year 5 is attributed to the changes in the cost of mechanization.

# A credit line to support farmers in the financing of the crop life cycle is critical in the stabilization of the liquidity of the farmer during the cash-intensive periods of crop cultivation (1/2).

## Cumulative net cash flow per month for a farmer

SMALL SCALE

UGX/month



- A. Farmers are generally low on cash between January and June with the cash position only improving in July after getting revenue from the first harvest.
- B. A credit line is key to the stabilization of the farmer cash position from the **third year** in the SDM, ensuring that farmers have a net positive cash flow throughout the year.
- C. Cash flow patterns are the same for both the small scale maize only farmer and a farmer cultivating both crops. However, maize only farmers tend to have higher cumulative cashflows compared to farmers cultivating both crops.

NOTES: \* Average % utilization of the credit line in the years the farmer is eligible for finance; \*\* Average cost of finance per month for the years and months the farmer is eligible for finance  
Income from other activities includes income from livestock, other crops and off farm labour and non-labour activities.

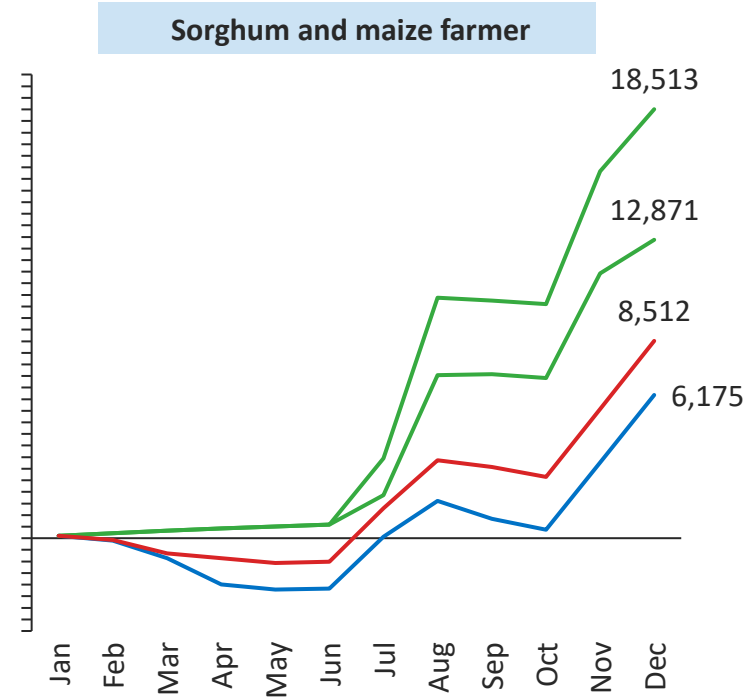
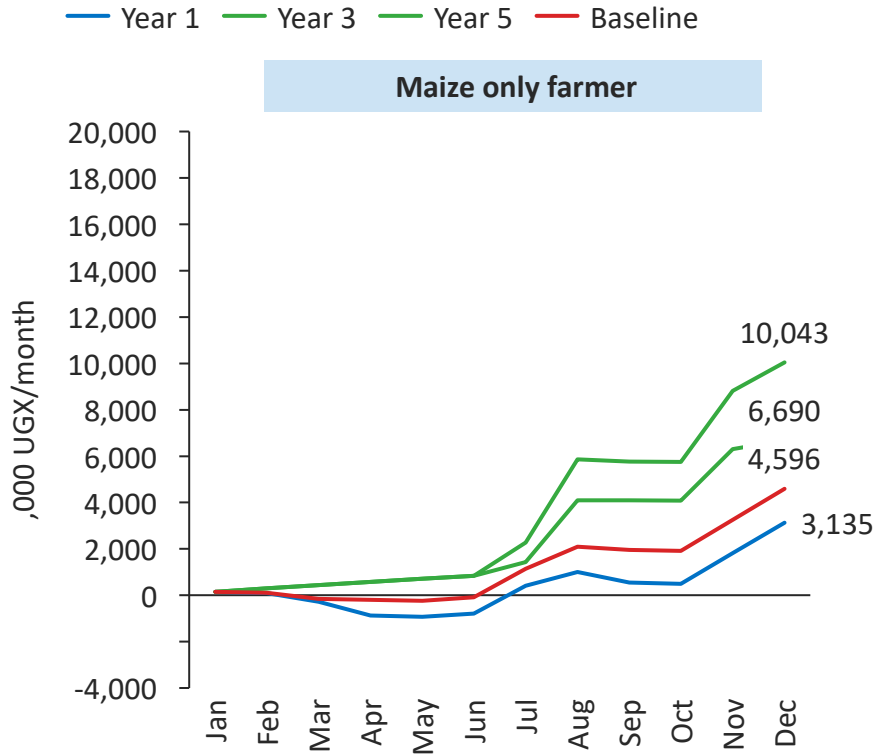


# A credit line to support farmers in the financing of the crop life cycle in critical in the stabilization of the liquidity of the farmer during the cash-intensive periods of crop cultivation (2/2).

## Cumulative net cash flow per month for a farmer

MEDIUM SCALE

UGX/month



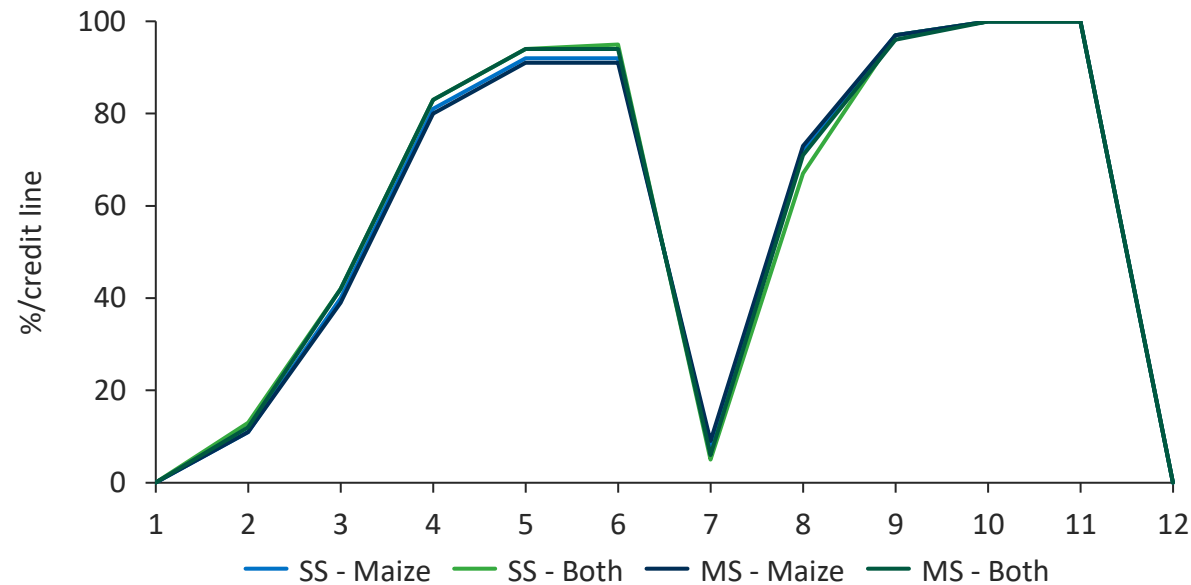
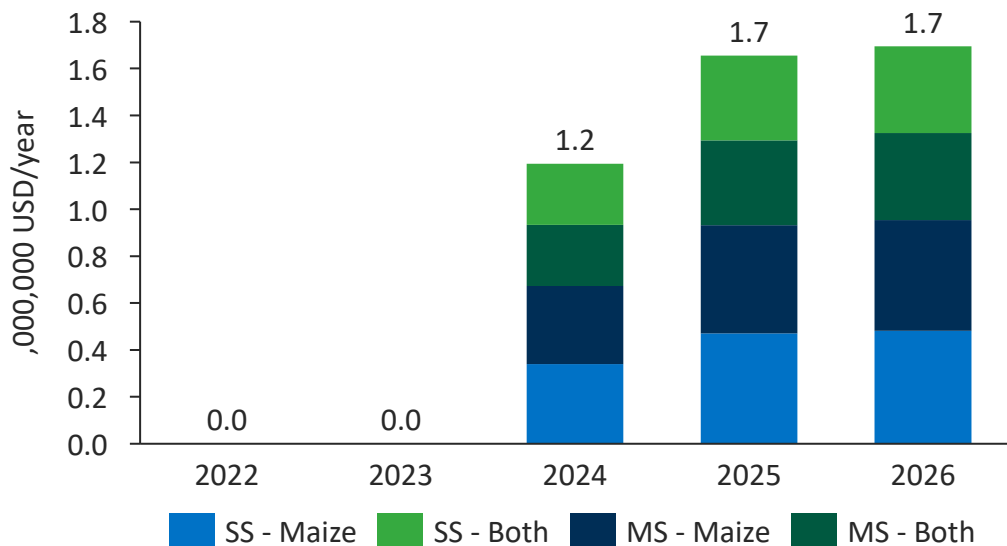
- A. Farmers are generally low on cash between January and June with the cash position only improving in July after getting revenue from the first harvest.
- B. A credit line is key to the stabilization of the farmer cash position from the Third year in the SDM, ensuring that farmers have a net positive cash flow throughout the year.
- C. Cash flow patterns are the same for both the maize only farmer and a farmer cultivating both crops. However, maize and sorghum farmers tend to have higher cumulative cashflows compared to farmers cultivating only maize.

NOTES: \* Average % utilization of the credit line in the years the farmer is eligible for finance; \*\* Average cost of finance per month for the years and months the farmer is eligible for finance  
Income from other activities includes income from livestock, other crops and off farm labour and non-labour activities.

## Afro-Kai is recommended to onboard a financial service provider within three years of establishing its SDM to ensure graduating farmers have access to finance from 2024 onwards.

### Monthly and annual credit requirement of farmer base

USD/year | %/year

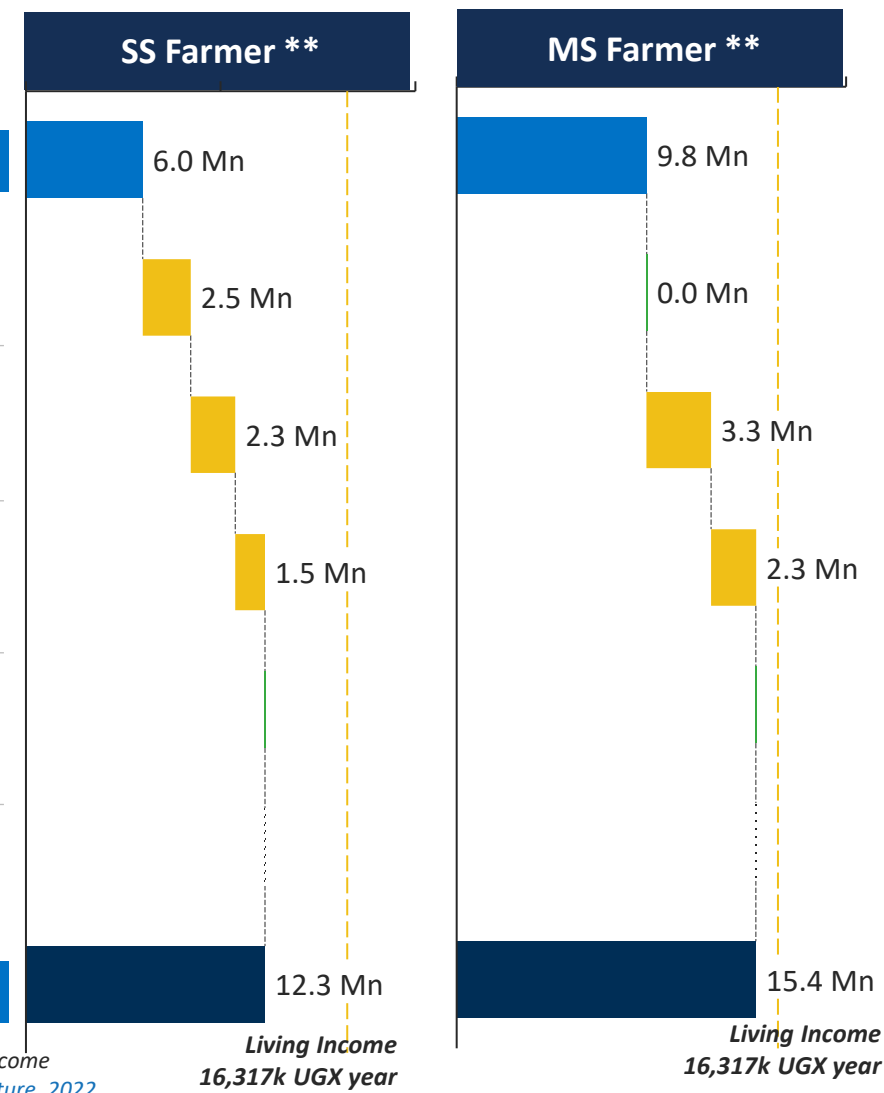


- A. Farmers are projected to access finance from 2024 onwards [after graduating to Star-2 \(which happens after 2 years in the SDM\)](#).
- B. Total demand for finance increases to up to 1.7 Mn USD/year from 2025 onwards, [based on 4,223 farmers in the SDM](#).

- C. All the farmer segments have the same depletion pattern of the credit line: during the first season (Feb – July), the credit line is not fully depleted and repaid in July; during the second season (July – Dec), the credit-line is fully depleted and repaid in December.

# Changes in the production area, productivity, and farm gate price are inadequate to close the Living Income gap, highlighting the need for farmers to diversify their income sources.

Feasibility		Change to close living income gap *	
Unlikely	Likely	Current	Maize
		Diversification	Feasible
<b>Current income (UGX/year)</b>			
<b>Production area</b> <i>Current sorghum/maize land-size and required change</i>	<ul style="list-style-type: none"> <li>Farmers require on average +5.5 acres to close the LI gap. In the short term, small scale farmers can lease additional 2 acres of land (350,000 UGX/acre) perhaps to meet the graduation requirements. Medium scale farmers have low incentive to lease land.</li> </ul>		
<b>Productivity</b> <i>Current productivity per acre and required change</i>	<ul style="list-style-type: none"> <li>Farmers have the potential to increase productivity to the obtainable yield of 2,588kg of maize and 2,471kgs of sorghum per acre/season through adoption of advanced farming practices that leverage technology. This is however limited by accessibility of such technologies, adverse weather conditions and an increase in the cost of inputs.</li> </ul>		
<b>Price (value add)</b> <i>Current price incl. premium and required change</i>	<ul style="list-style-type: none"> <li>Prices require to increase to 2,600 UGX/kg (+100%) for maize. Prices have however only increased by 200 UGX/kg (+15%) on average in the past. *** / ****</li> </ul>		
<b>Cost of Production</b> <i>Current cost of production per acre and required change</i>	<ul style="list-style-type: none"> <li>For this analysis we assume the cost of production to remain relatively stable and potentially only to increase.</li> </ul>		
<b>Diversified income</b> <i>Current non-sorghum/maize income and required change</i>	<ul style="list-style-type: none"> <li>Farmers have the potential to close the living income gap by engaging in other income-generating activities, including the cultivation of other crops, and rearing of livestock among other enterprises. Further analysis is required to determine the extend to which living income gap is closed with diversification.</li> </ul>		
<b>Feasible income (UGX/year)</b>			



Notes: \*For the analysis of each of the driver, all the other factors that influence the income are held constant \*\* The values presented in the graphs is the income change that can be attained with the context of the SDM \*\*\* [Famine Early Warning Systems Network, 2022](#) \*\*\*\* [Advocacy Coalition for Sustainable Agriculture, 2022](#)

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IDH Annual Report 2021



IDH Shifting Gears

This report was built using think-cell

# 8. Annex

*This section includes the following subchapters:*

*8.1 Context of the SDM*

*8.2 Profile of farmers (Farmer survey data)*

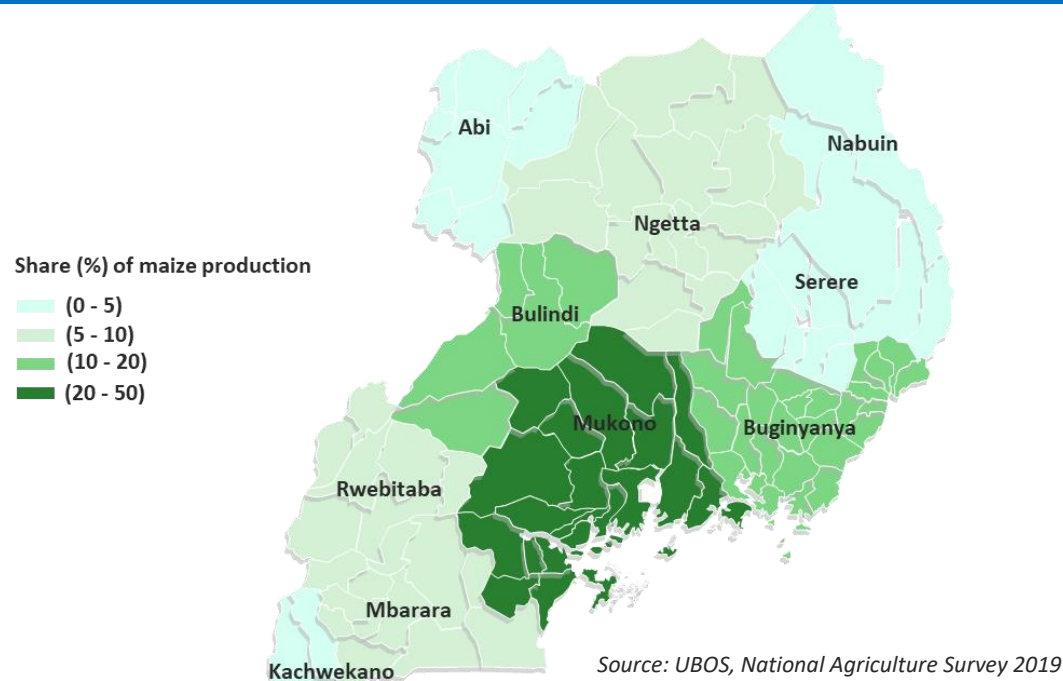
*8.3 Assumptions and methodology*

# 8.1 Context of the SDM

# Maize is a major crop grown by a significant proportion of farmers in Uganda, while sorghum is mainly grown by farmers in drought prone areas.

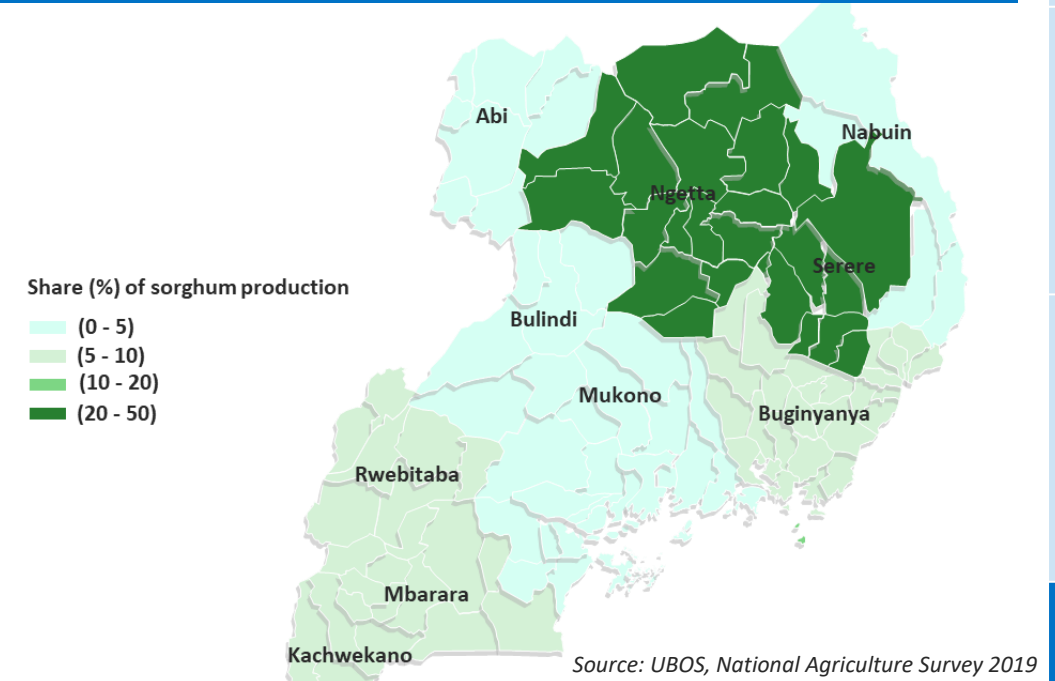
- Maize is grown by **4.1mn** agricultural households (close to **60%**<sup>1</sup> of all agricultural households) with highest production witnessed in the central, western and eastern regions of the country in two seasons annually.
- Production is largely rain-fed with two farming seasons per year. In 2020, maize accounted for **10%** of total agricultural production (4<sup>th</sup> most produced crop)<sup>2</sup> in the country and **13%** of total area harvested (3<sup>rd</sup> crop by area harvested).<sup>3</sup>

Maize production by agricultural zones\*, 2019



- Sorghum is produced by **753,000** agricultural households (**11%**<sup>4</sup> of all agricultural households) mostly in Northern, Eastern and Southwestern regions of the country that are more prone to droughts in two seasons annually.
- In 2020, sorghum accounted for **1%** of total agricultural production (13<sup>th</sup> most produced crop)<sup>5</sup> in the country and **4%** of total area harvested (8<sup>th</sup> crop by area harvested).<sup>6</sup>

Sorghum production by agricultural zones\*, 2019



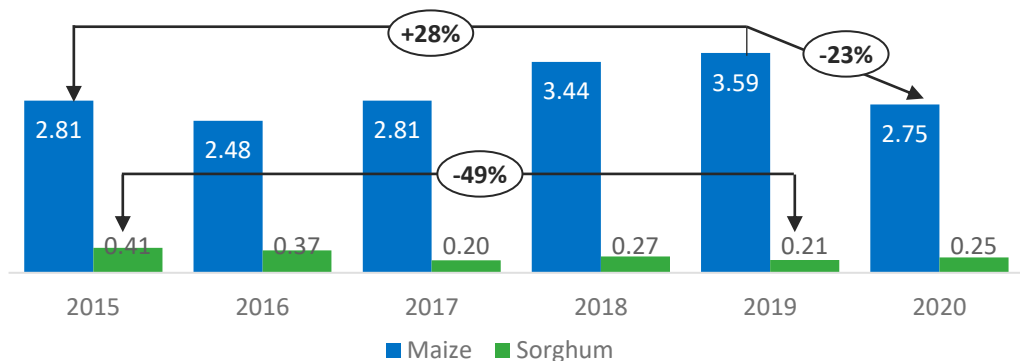
Sources: 1) UBOS, National Agriculture Survey 2019; 2) FAOSTAT; 3) FAOSTAT; 4) UBOS, National Agriculture Survey 2019; 5) FAOSTAT; 6) FAOSTAT

\*Zonal Agricultural Research and Development Institutes (ZARDI)

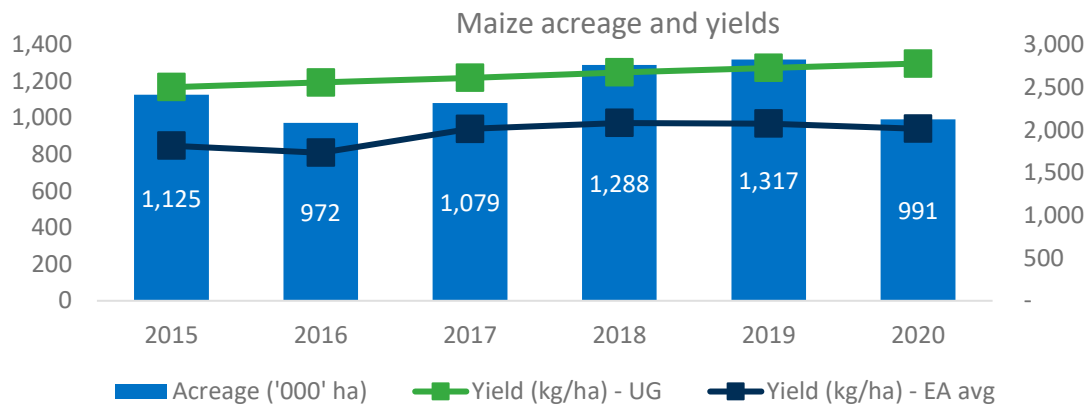
# Maize production has experienced moderate growth in the last years, largely driven by a steady expansion of acreage, and little from improved productivity. Sorghum production on the other hand has been declining

Fluctuation in production of maize was experienced in 2019/2020 as a result of disruptions brought about by COVID-19<sup>1</sup>

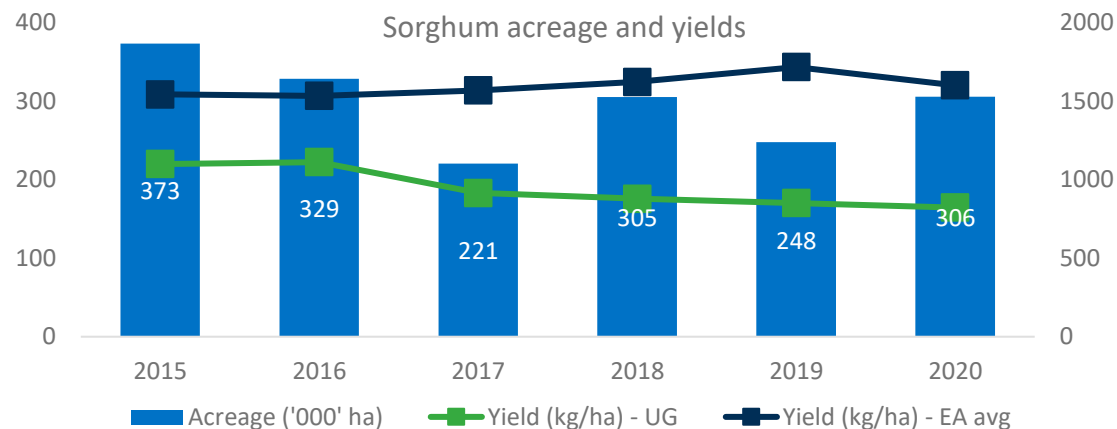
Maize and sorghum production '000,000' tonnes



While there has been limited productivity growth for maize in recent years, Uganda performs better than the Eastern Africa\* region average<sup>2</sup>



On the other hand, sorghum productivity levels are significantly lower than the Eastern Africa\* region average<sup>3</sup>



## Production dynamics

- Maize production increased by 28% between 2015-2019 largely driven by increase in area under cultivation that grew by 17% over same period.<sup>4</sup>
- Maize productivity continue to be strained by use of low-quality inputs where the informal market accounts for 85-90% of all seeds used by farmers and only 5-15% of total seed is improved.<sup>5</sup> Further, only 5% of maize plantings receive the recommended fertilizer dosage.<sup>6</sup> The Agriculture Cluster Development project by the World Bank and Ministry of Agriculture seeks to increase productivity by 30%.<sup>7</sup>
- In contrast, both sorghum production and area under cultivation decreased by 49% and 34% respectively between 2015-2019. Constant pests and diseases attacks have kept yields significantly low. Smut and grain mold which are the common diseases contribute 27% and 21% respectively to yield loss while stem borers and shootfly, the common insect pests contribute 42% and 25% respectively to yield loss.<sup>8</sup>

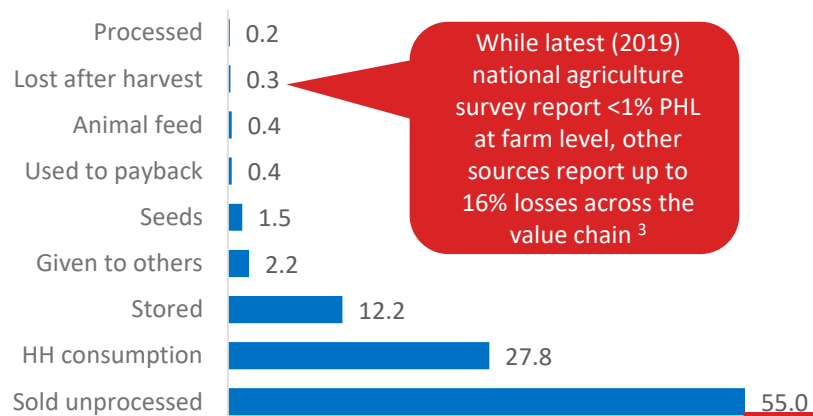
\*Eastern Africa region as defined by the United Nations

Sources: 1,2,3,4) FAOSTAT; 5,6) International Growth Centre -policy Brief – Maize value chain in EA, 2017; 7) Agriculture Cluster Development Project 8) Sorghum production handbook for Uganda, 2019

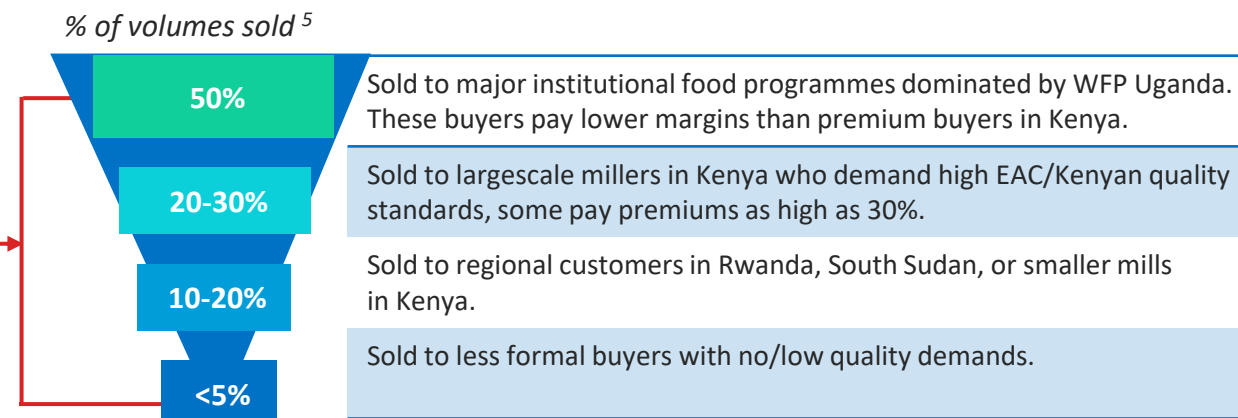


# Maize and sorghum remain key for food security with a large proportion of both grains consumed by the households

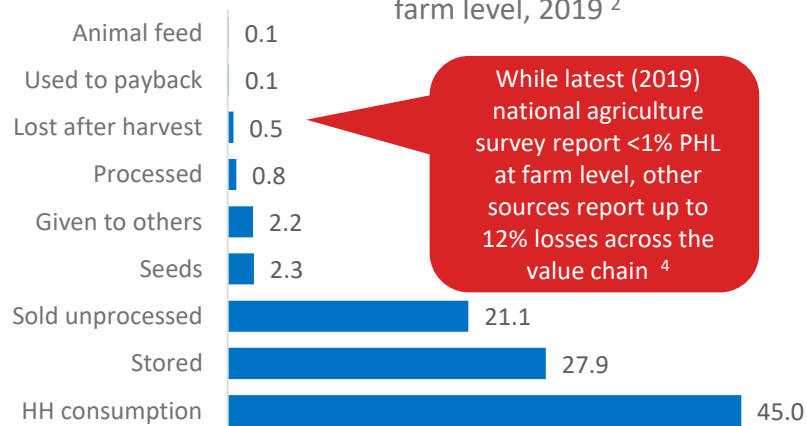
Maize use (% share of total production)\* at the farm level, 2019 <sup>1</sup>



Maize buyers in Uganda can be categorized in four main tiers



Sorghum use (% share of total production)\* at the farm level, 2019 <sup>2</sup>



## Sorghum uses

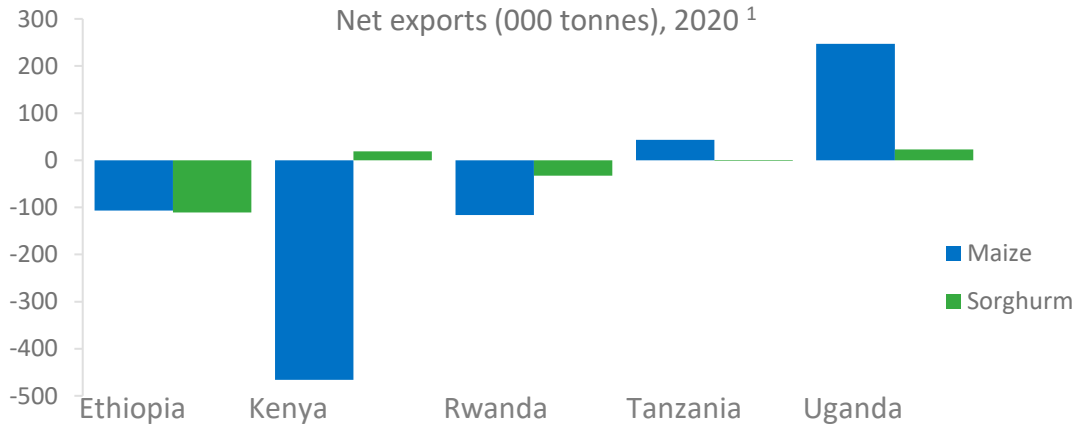
- Sorghum is the main staple food in the northern, north-eastern and south-western parts of the country mainly consumed in the form of semi leavened bread, dumplings, fermented and non-fermented porridge.
- In the manufacturing sector, it is increasingly been used in the brewing industry by players such as Nile Breweries Ltd. It is also used in production of dietary packed foods for children, used to process animal feed for pig and cattle fattening, although at a small scale.
- Sorghum is also exported to regional countries such as South Sudan, Tanzania and Burundi that accounted for 57%, 23% and 13% of sorghum export values in 2020.<sup>6</sup>

\*Average for the two seasons

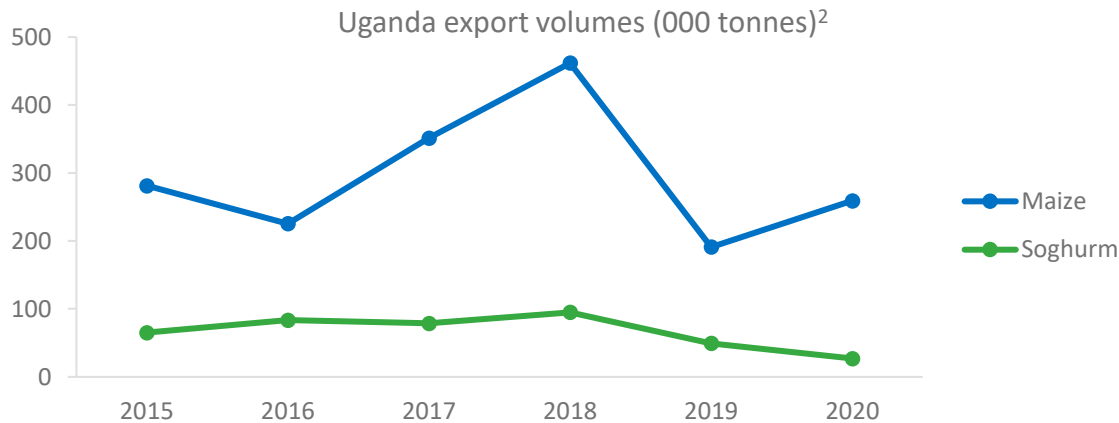
Sources: 1,2) UBOS, National Agriculture Survey 2019; 3,4) African Postharvest Losses Information System (APHLIS) 5) International Growth Centre -policy Brief – Maize value chain in EA, 2017; 6) International Trade Centre Statistics

# The East Africa region presents significant trade opportunities for Uganda’s surplus grains; some challenges, however, limit the potential

## Uganda is the biggest regional exporter of maize and sorghum



An average of 10% of maize and 24% of sorghum produced is exported. Export volumes have however fluctuated in recent years due to strict quality standards imposed by importing countries.

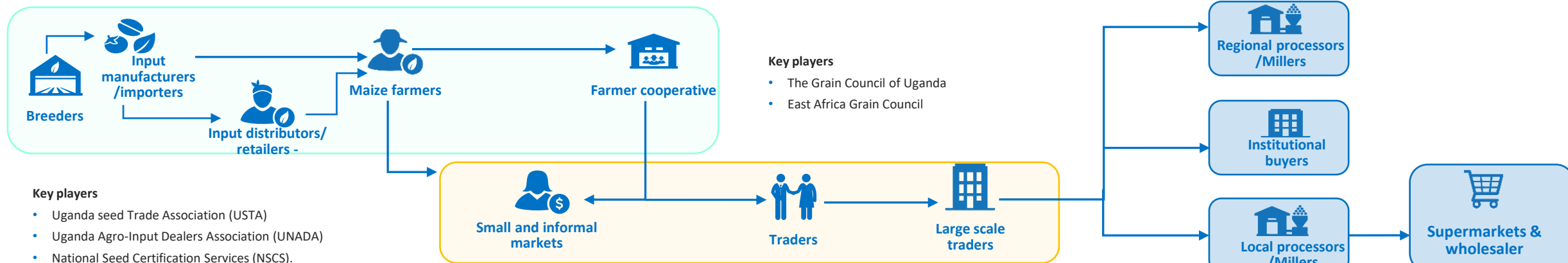


Sources: 1,2; FAOSTAT

## Trade Opportunities and Challenges

- Uganda alongside Tanzania contribute to much of the region’s internal grain exports - Favourable weather conditions, and surplus production enable Ugandan farmers and aggregators to take advantage of cross-border trade opportunities
- Currently, there are high export volumes and opportunities from Uganda towards Kenya, Rwanda and South Sudan. Economic expansion, population growth and changing consumer tastes will further enhance such opportunities.
- In recent times, regional governments – particularly those in East Africa – have taken significant steps to address Non-Tariff Barriers (NTBs). Among the most recent developments has been the adoption of the EAC harmonised Staple Foods Standards and the passing of the Elimination of the Non-tariff Barriers Bill
- However, implementation of the standards has been well-below expectation due to capacity constraints facing the public agencies tasked with enforcing them. Therefore, challenges persist and exporters continue to encounter sanitary and phytosanitary (SPS) constraints in trading with nearby countries.
- Such quality standards have increasingly gained attention in deficit countries such as Kenya (which accounts for more than 50% of Uganda maize exports). For instance, Kenya temporarily banned maize imports from Tanzania and Uganda due to high levels of aflatoxins in 2021. This led to reduction in prices received by farmers.
- Furthermore, inadequate or lack of good road and rail networks contributes to high logistics costs that can reduce the potential gains from trade

# Limited integration in the value chain has resulted to farmers heavily relying on middlemen/informal traders to market their produce

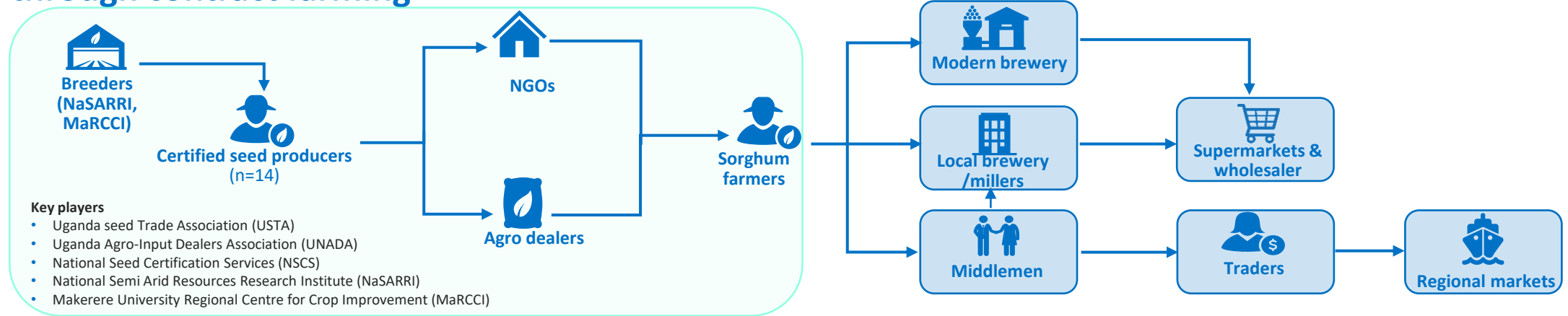


## Inputs      Production      Aggregation      Marketing & distribution      Processing

- |  |   |  |
|--|---|--|
| <ol style="list-style-type: none"> <li>1. There are over 23 maize seed producing companies with the top 4 holding 56% of the market share.<sup>1</sup></li> <li>2. Production and consumption of certified maize seeds rose by 5% and 10% respectively between 2017-2019<sup>2</sup>, use is however, still limited with only 15% of the land planted with improved seeds.<sup>3</sup></li> <li>3. Fertilizer use is also low with less than 5% of the acreage under production fertilized.<sup>4</sup></li> <li>4. Access to finance is a critical challenge hindering access to quality inputs. Farmers thus rely on informal source which has led to persistence of counterfeits.<sup>5</sup></li> <li>5. There are ~4.1mn maize producing households with average land size of 0.4ha accounting for over 90% of maize production.<sup>6</sup></li> </ol> | <ol style="list-style-type: none"> <li>6. Most farmers do not belong to cooperatives and rely on a network of village agents, retail traders, and wholesalers who buy maize from farmers. Maize can pass through at least 4 sets of traders before reaching the processors.<sup>7</sup></li> <li>7. Most of the traders are however not equipped to differentiate output by quality ultimately leading to reduced prices in premium markets like Kenya.</li> <li>8. Poor drying and storage makes the maize susceptible to aflatoxins. Maize is also harvested with 20-25% moisture content, much higher than the 13.5% EAC standards.<sup>8</sup></li> <li>9. Maize is supplied to either local processors, institutional buyers such as WFP and regional markets in Kenya, Rwanda and South Sudan.</li> </ol> | <ol style="list-style-type: none"> <li>10. 60% of the maize is turned into flour, 37% to animal feed and 3% used in beer production.</li> <li>11. Maize processing is dominated by dry mill technology with 3 key outputs <b>a) number 1 flour</b> (highest quality) produced by medium and large-scale mills and sold to regional markets and institutional buyers <b>b) number 2 flour</b> (2nd-highest quality) produced by over 600 small scale mills in rural areas and <b>c) animal feeds</b> produced by medium-sized millers.</li> </ol> |
|--|---|--|

1,2) *The Africa Seed Access Index, 2020* 3) *UBOS, National Agriculture Survey 2019*; 4) *Africa Fertilizer – fertilizer consumption in Uganda, 2015*; 5) *International Growth Centre -policy Brief – Maize value chain in EA, 2017*; 6) *UBOS, National Agriculture Survey 2019*; 7,8) *Duke – Maize value chains in East Africa, 2016*

# Establishment of modern breweries in the country is leading to more structured engagement with farmers through contract farming

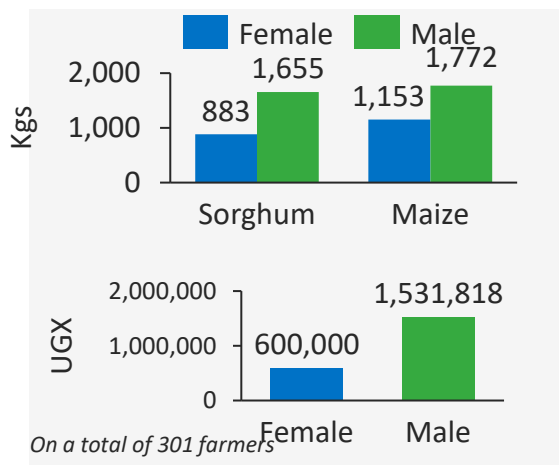


Inputs	Production	Marketing & distribution	Processing
<ol style="list-style-type: none"> <li>1. There are more than 14 companies specializing in the production of sorghum seed in the country.<sup>1</sup></li> <li>2. There are only 3 active sorghum seed breeders and thus limited capacity and delays in release of new varieties. About 40 varieties of sorghum currently exist in Uganda.<sup>3</sup></li> <li>3. Production and consumption of improved seed increased by more than 360% and 340% respectively between 2017-2019.<sup>4</sup> Use of certified/improved seeds, however, remains low (&lt;1% of the area planted).<sup>5</sup></li> <li>4. Limited use of both organic and inorganic fertilizers has resulted in low yields.</li> <li>5. Sorghum is grown by ~ 753,000 agricultural households with average land size of 0.4ha.<sup>6</sup></li> </ol>		<ol style="list-style-type: none"> <li>6. Farmer groups and cooperatives in the sorghum value chain remain small, informal and weak and thus struggle to provide substantial support to farmers.<sup>7</sup></li> <li>7. Sorghum is mainly sold directly to local breweries and/or local flour millers and to modern breweries (in the case of contract farming).</li> <li>8. Middlemen also pick sorghum from the farmers and deliver to the local breweries and/or traders.</li> <li>9. Traders export some of the sorghum to regional markets.</li> </ol>	<ul style="list-style-type: none"> <li>• Nile Breweries Ltd is the main modern brewery that makes commercial beer (<i>Eagle extra and Eagle lager</i>).</li> <li>• Local breweries use the sorghum to make local sorghum brew called Malwa or Ajon.</li> <li>• There are also local millers that manufacture sorghum flour.</li> </ul>

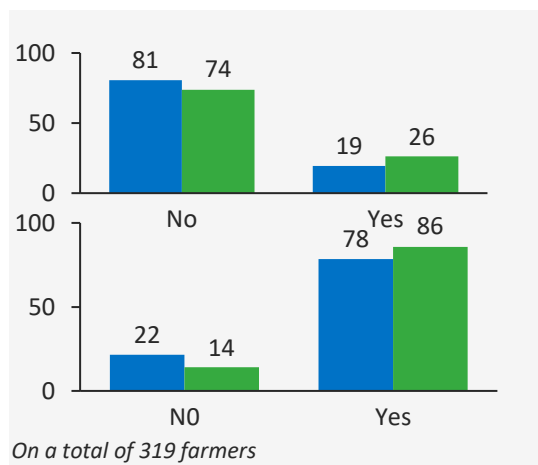
1,2) *The Africa Seed Access Index, 2020*; 3) *Innovation opportunities in sorghum production in Uganda, 2018*; 4) *The Africa Seed Access Index, 2020*; 5, 6) *UBOS, National Agriculture Survey 2019*, FAOSTAT; 7) *SAJAE - Assessing farmer involvement in collective action for enhancing the sorghum value chain in Soroti, Uganda, 2017*

# Yields are observed to be higher in MOF. The average loan size for male farmers is more than twice that of female farmers.

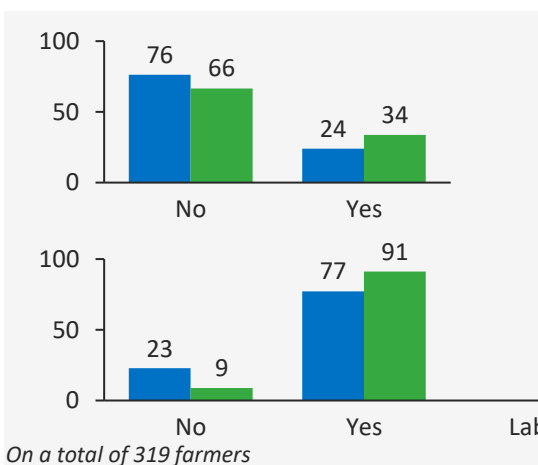
## Average Yield and Loan Size



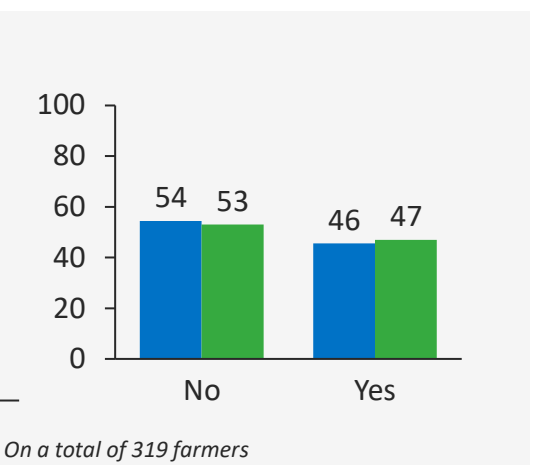
## Bank and Mobile Money Account



## Credit Access and Input Usage in the Past 12 Months



## Access to Training

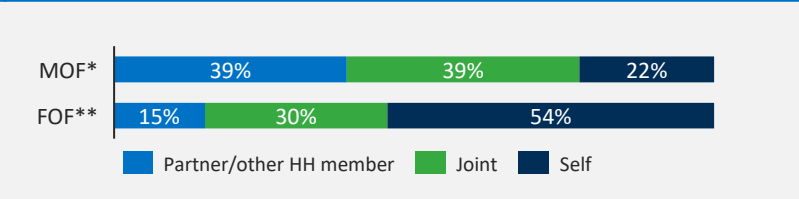


## Household profile

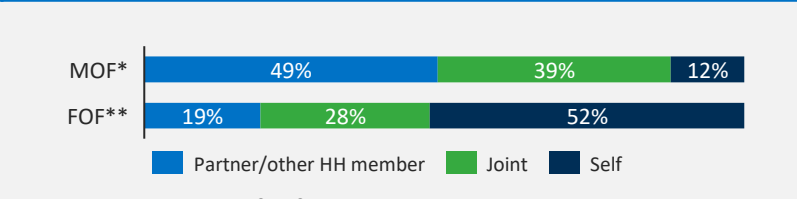
Role division	Decision making in household activities	Decision making in farm activities
---------------	---	------------------------------------

	Female head of HH	Male head of HH
FOF*	49.46%	50.54%
MOF**	0.44%	99.56%

15% of the households are headed by women while 85% are headed by men. Men are less likely to be involved in farming activities where the household is headed by a woman. Women are more involved in decision making both in household and farm activities<sup>1</sup>



For MOF, Household activities decision making is majorly done by the partner or other HH members. For FOF, decision making is majorly done by self. Notably, the proportion of decision making for self is higher for FOF (54%) compared to MOF (22%)



Decision making for farm activities is majorly done by the partner or other HH member for MOF and by self for FOF. Joint decision making is observed to be higher in MOF compared to FOF

\*Male-operated farms \*\*Female-operated farms

Sources: All data comes from farmer PDC except specified otherwise. 1) National Survey and Segmentation of Smallholder Households in Uganda 2016

# AKL views food security as a key opportunity for the business, with significant investments in seed production, Flour milling, and fish food processing.

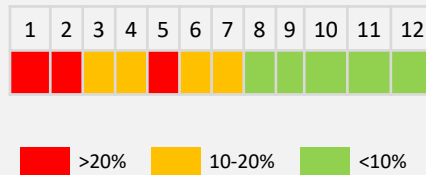
## Climate risks exposure and impact

### RISK EXPOSURE



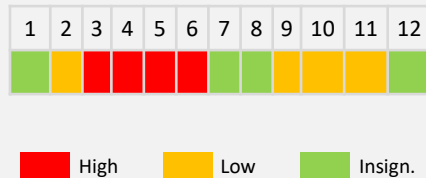
#### Food Access & Availability

Percent of farmers that expressed that they face food shortages during this month of the year. Farmers are most food insecure in during the first quarter of the year.



#### Cash flow Stability & Access

In The first six months of the year, Farmers are mostly spending both at the household and farm level with very minimal income. Farmers get a reprieve after the first harvest in July



### FARMER RESILIENCE AND IMPACT

#### Farmer resilience

- Small holder farmers in Uganda have limited income compromising their ability to buy food. Most of the food needs at the household level can however be met with the farm produce<sup>2</sup>.

#### Impact

- FAO estimates that 21.7% of the population in Uganda is facing severe food insecurity<sup>1</sup>.
- This has likely deteriorated in the recent years given the implication of COVID pandemic on farming households and the influx of refugees<sup>2</sup>
- 32% of the population has access to basic water supply while 19% have access to basic sanitation<sup>3</sup>

## Measures taken by Afro-Kai

### ADAPTATION MEASURES/POLICIES IN PLACE

#### Adaptation measures

- AKL has an established subsidiary (FICA seeds) tasked with the goal of developing quality seeds that are adaptable to the weather conditions of the region.
- The commodities portfolio of the company is diversified. AKL sources multiple crops from the farmers in addition to maize and sorghum including beans and potatoes. Further, the company has established a fish food processing plant to complement its core business in grain sourcing.
- Through seasonal training, AKL emphasizes the need for crop diversification among the farmers and the use of certified inputs in the cultivation process.




### CHALLENGES/ROOM FOR IMPROVEMENT

#### Challenges in implementation

- Lack of sufficient data collection and management practices which limits the ability of the company to optimize its impact. The company for instance does not collect any data on crop diversification at the farm level
- Lack of trust between the company and farmers resulting in the violation of off-take agreements by the farmers. There is a need to develop modalities for mutually beneficial engagements between AKL and the farmers.

Sources: 1) [FAO 2017](#) 2) [Famine Early Warning Systems Network 2022](#) 3) [Global Waters Organization](#)

# Continued climate change has resulted in severe droughts putting pressure on the maize and sorghum producing regions and posing a significant business risk for Afro-Kai.

Climate risks exposure and impact		Measures taken by Afro-Kai Limited
Risk exposure	Farmer resilience and impact	Current measures/policies and challenges
 <p><b>Temperatures</b> (change in) short- and long-term averages</p> <p><b>Medium risk</b></p> <ul style="list-style-type: none"> <li>Significant increase at a rate of 0.52°C per decade over the past 30 years, and an expected increase of 1.7°C- 1.8°C by 2050.<sup>1),2)</sup></li> </ul>	<p><b>Farmer resilience</b></p> <ul style="list-style-type: none"> <li>Current farmer income levels limit them from making investment to adapt/mitigate climate change and are thus severely affected by extreme weather occurrences.</li> </ul> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Over 82%, 40% and 17% of agricultural households in Uganda reported loss due to droughts, pests and diseases and floods respectively in 2019.<sup>4)</sup></li> <li>The loss of crops and insufficient production has led to continued food shortage in the country.<sup>5)</sup></li> </ul>	<p><b>Strategy, measures and policies</b></p> <ul style="list-style-type: none"> <li>Severe weather events such as droughts that have been experienced in recent years lead to destruction of crop, and pose a business risk to AKL, making it hard to reach their volume and quality targets.</li> <li>Through the extension services delivered, AKL will provide trainings on drought resistant varieties. AKL can also potentially leverage the FMS to provide climate and weather advisory to farmers to inform their production.</li> </ul> <p><b>Challenges and room for improvement</b></p> <ul style="list-style-type: none"> <li>Limited data available on the climate and weather patterns, soil fertility etc., of the focus regions to inform zoning and advisory on crop combination based on regions.</li> <li>Limited uptake of crop insurance amongst farmers. There is an opportunity to work with insurance providers to promote uptake.</li> <li>Lack of information on existing low cost climate smart technologies that can be leveraged by the farmers.</li> <li>Other competing priorities for financial resources in the company.</li> </ul>
 <p><b>Precipitation</b> (change in) timeliness and availability</p> <p><b>Medium risk</b></p> <ul style="list-style-type: none"> <li>Number of days with heavy precipitation events is expected to increase from 8 to 10 by 2080.<sup>3)</sup></li> <li>Future dry and wet seasons are projected to become more extreme.<sup>3)</sup></li> </ul>		
 <p><b>Climate extremes</b> (change in) likelihood and severity of hail, floods, locusts, etc.</p> <p><b>High</b></p> <ul style="list-style-type: none"> <li>Increase in the frequency of droughts and floods in the focus regions.</li> </ul>		

Sources: 1) CGIAR (2019); 2) Dutch Ministry of Foreign Affairs (2019); 3) GIZ (2020); 3) 4); UBOS, National Agriculture Survey 2019

## While the government has made deliberate efforts to promote sustainable agriculture production; information asymmetry, climatic risks and financial exclusion remains to be significant challenges.

	Risk	Neutral	Opportunity	
Definition	Situation			Impact on SDM
<b>TECHNOLOGY</b>			<ul style="list-style-type: none"> <li><b>Mobile penetration</b>   Close to 65% of the rural population own a mobile phone<sup>1</sup> with 46% of the population connected to 3G networks.<sup>2</sup> Farmers are increasingly using mobile money with 21% of farmers having access to a mobile money account.<sup>3</sup> About 28% of all agricultural payments are made using mobile money.<sup>4</sup></li> <li><b>Internet penetration</b>   On the other hand, internet penetration in rural Uganda is with only 9% of the population having access.<sup>5</sup></li> <li><b>Digital agricultural technologies (DATs)</b>   . There are close to 200 DATs in different stages of growth operating in the country focused on solving critical challenges across the value chain.<sup>6</sup></li> </ul>	<ul style="list-style-type: none"> <li>Leveraging DATs provide an opportunity to improve value chain operations, increase efficiencies and enhance access to finance and inputs for the farmers.</li> </ul>
<b>ENVIRONMENT</b>			<ul style="list-style-type: none"> <li><b>Production systems</b>   Farmers in Uganda rely largely on rain-fed agriculture (over 80% of production) which makes them highly susceptible to climate change.<sup>7</sup></li> <li><b>Crop insurance</b>   Index-based weather insurance lacks adoption due to weak regulations, weather data quality and a lack of local adaptation and capacity building.<sup>8</sup></li> <li><b>Climate vulnerability</b>   Uganda is the 14th most vulnerable country and the 48th least ready country – meaning that it is very vulnerable to, yet unready to address climate change effects.<sup>9</sup></li> </ul>	<ul style="list-style-type: none"> <li>Worsening and less predictable environment increase the risk of harvest losses and instable sourcing volumes. This also presents an opportunity to promote uptake of climate smart technologies.</li> </ul>
<b>INFRASTRUCTURE</b>			<ul style="list-style-type: none"> <li><b>Infrastructure Index</b>   Uganda scores 3.3, higher than Sub Saharan Africa average of 2.9 on the infrastructure index.<sup>10</sup></li> <li><b>Road quality</b>   A large proportion of the roads are unpaved which makes it hard to travel during rainy days and also limits farmers direct access to urban markets.<sup>11</sup></li> </ul>	<ul style="list-style-type: none"> <li>Poor infrastructure increases the cost of value chain operations impacting the profitability of both the farmer and the SDM operator.</li> </ul>
<b>LABOR</b>			<ul style="list-style-type: none"> <li><b>Availability</b>   Sorghum and maize farming tends to be labour intensive especially during planting, weeding and harvesting. Farmers rely on family and seasonal labour from their communities, which is scarce and insufficient during peak periods.<sup>12</sup></li> </ul>	<ul style="list-style-type: none"> <li>Labor is a key factor of production. Limited access reduces the capability of the farmers to optimize production.</li> </ul>
<b>INPUTS AND FINANCING</b>			<ul style="list-style-type: none"> <li><b>Credit access</b>   Only 4% of the rural population has access to formal lenders mainly through SACCOs.<sup>13</sup></li> <li><b>Savings</b>   The majority of farmers save informally through VSLAs or keep the cash at home.<sup>13</sup></li> <li><b>Inputs use</b>   With limited access to finance, use of fertiliser and hybrid seed has remained limited.<sup>14</sup></li> </ul>	<ul style="list-style-type: none"> <li>Inadequate finance limits the capacity of the farmers to invest in high yielding inputs.</li> <li>Working capital constraints for Afro-Kai reduces their ability to scale and achieve greater impact.</li> </ul>

1) World Bank, 2019; 2) GSMA (2020); 3) CGAP (2016); 4) World Bank, Global Findex Database (2017); 5) Research ICT Africa (2019); 6) Uganda Communication Commission (2019); 7) UNDP (2022); 8) Ntukamazina (2017); 9) Dutch Ministry of Foreign Affairs (2019); 10) World Bank (2017); 11) The Borogen Project (2020); 12) Afro-Kai field visit; 13) FSD Uganda (2019); 14) International Growth Centre -policy Brief – Maize value chain in EA, 2017



## While the government has made deliberate efforts to promote sustainable agriculture production; information asymmetry, climatic risks and financial exclusion remains to be significant challenges.

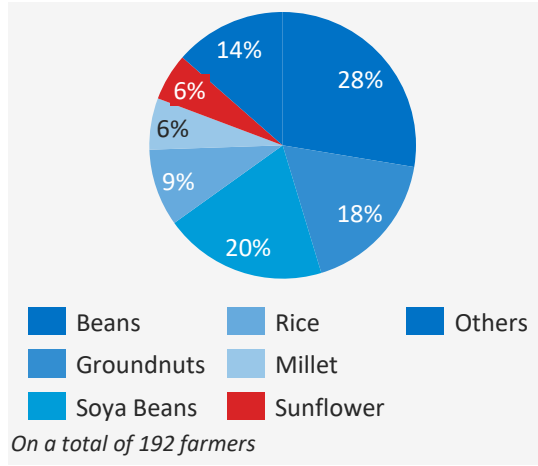
	Risk	Neutral	Opportunity	
Definition	Situation			Impact on SDM
<b>Trading Systems, Pricing and Competition</b>	<ul style="list-style-type: none"> <li>• <b>Institutional buyers</b>   Large buyers such as WFP and ICRC have a huge influence on the final prices of grain in the country. Local processors such as Nile and Uganda Breweries also influencing the quality of grain (sorghum) produced and traded.<sup>1</sup></li> <li>• <b>Middlemen</b>   Multiple levels of formal and informal traders involved across the grain supply chain.<sup>1</sup></li> <li>• <b>Farm gate price</b>   Generally prices paid to farmers have remained low despite increase in prices of agricultural products largely due to exploitation by middlemen.<sup>2</sup></li> </ul>			<ul style="list-style-type: none"> <li>• The high fragmentation of the value chain exposes farmer to the risk of selling at low prices.</li> <li>• With the high number of intermediaries there is also a high risk of side selling.</li> </ul>
<b>Institutional Stability</b>	<ul style="list-style-type: none"> <li>• <b>Institutions coordination:</b> Multiple public institutions engaged in the sector with limited coordination. History of failure/abolishment of agricultural institutions before achieving their mandates.<sup>3</sup></li> <li>• <b>Policy and regulations</b>   Inconsistencies around agricultural policies and regulations resulting in delays in implementation.<sup>3</sup></li> </ul>			<ul style="list-style-type: none"> <li>• Institutional stability is key to creating a predictable environment that is important in incentivizing value chain investment.</li> </ul>
<b>Land Tenure</b>	<ul style="list-style-type: none"> <li>• <b>Tenure</b>   80% of agricultural land is under customary tenure that is undocumented,<sup>4</sup> facilitating the rise in land-grabbing.<sup>5</sup></li> <li>• <b>Ownership</b>   The largest and productive pieces of land are owned by men mostly through inheritance. Only 16% of landowners are women are.<sup>6</sup></li> </ul>			<ul style="list-style-type: none"> <li>• Informal land tenure may disincentives long term capital investment on the land needed to enhance production. Also limits use of land as collateral for formal financing.</li> </ul>
<b>Social Norms</b>	<ul style="list-style-type: none"> <li>• <b>Literacy</b>   Women in Uganda are more likely to be illiterate than men and leave school earlier partly contributing to their limited access to productive assets.<sup>7</sup></li> <li>• <b>Gender equality</b>   While women are instrumental in the provision of farm labour, their decision making is very limited. Extension systems have also majorly targeted male farmers.<sup>8</sup></li> </ul>			<ul style="list-style-type: none"> <li>• Need for deliberate efforts to include women in the SDM for maximum impact.</li> </ul>

1) [International Growth Centre -policy Brief – Maize value chain in EA, 2017](#); 2) [Uganda Journalist Resource Centre \(2016\)](#); 3) [National Agriculture Policy \(2013\)](#); 4) [World Bank \(2018\)](#); 5) [USAID \(2016\)](#); 6) [Gender Land and Rights Survey \(2011\)](#); 7) [Uganda Bureau of Statistics \(2016\)](#); 8) [Bjorn \(2020\)](#)

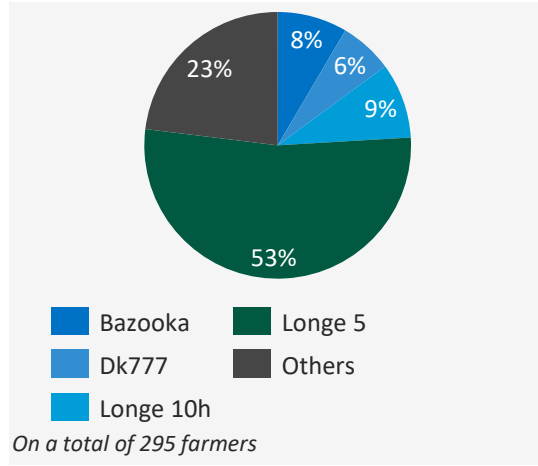
## 8.2 Profile of farmers (Farmer survey data)

**Beans, Soya beans, and Groundnuts are the other main crops cultivated by the farmers. Loan uptake by the farmers is low. The proportion of male farmers is higher compared to female farmers.**

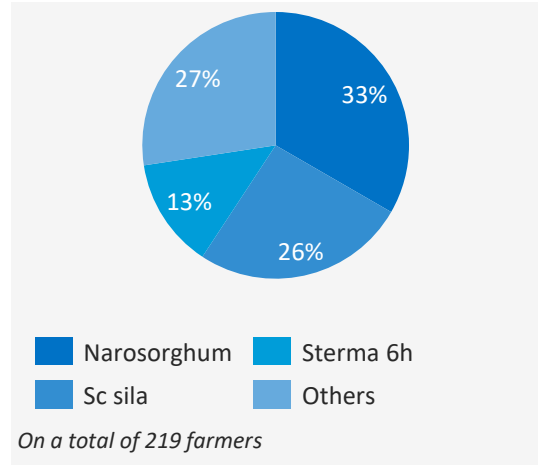
**Other Main crops cultivated**



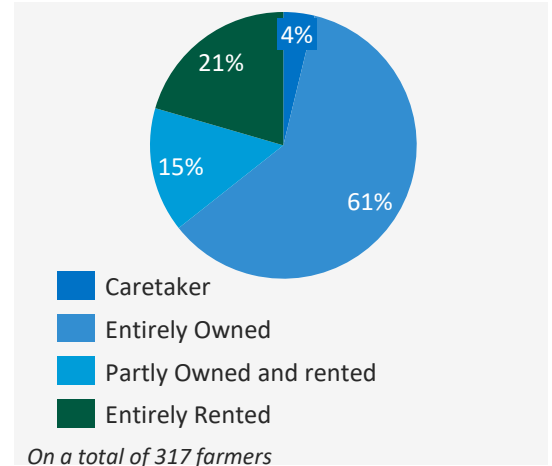
**Maize Varieties**



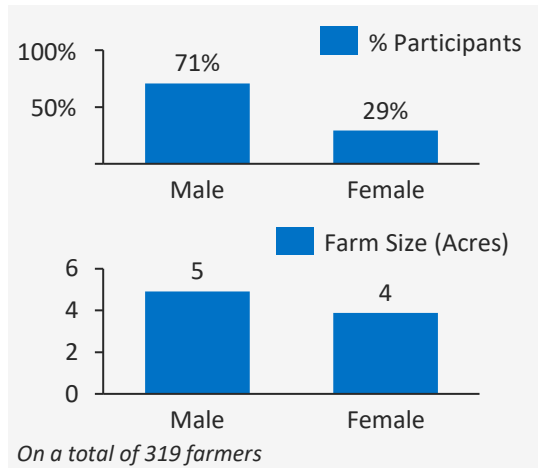
**Sorghum Varieties**



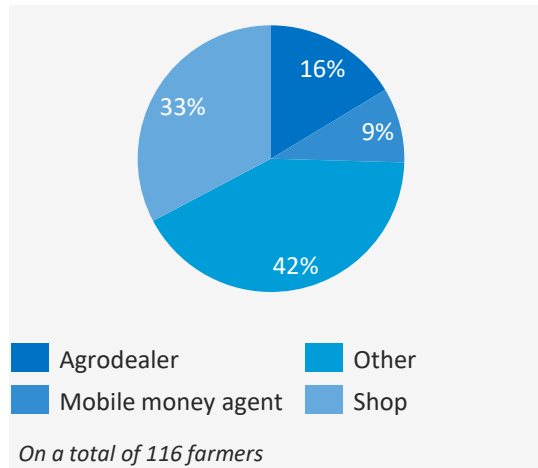
**Land ownership**



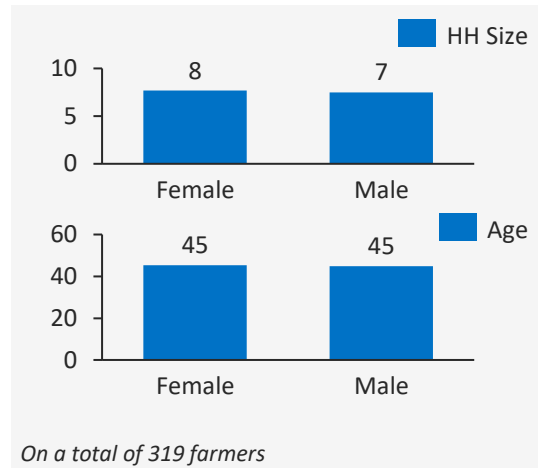
**Farmer Gender and Farm Size**



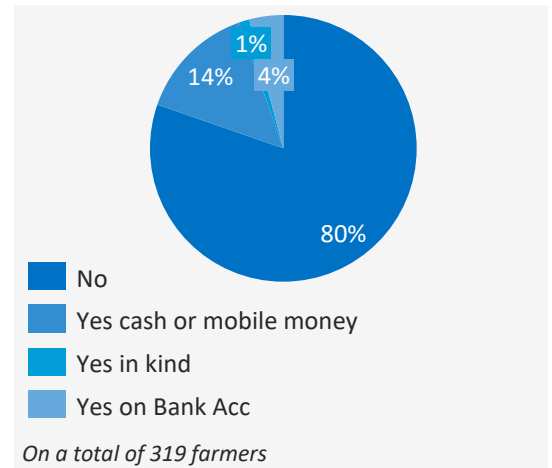
**Off Farm Enterprises**



**HH Size and Age**



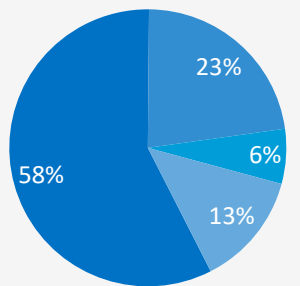
**Loans in the past 12 months**



# Farmers are generally satisfied with the services provided through the SDM and they are more likely to recommend Afro-Kai to people within their circle.

## Recommendation from farmers

How likely is it that you would recommend Afro-Kai to a friend/peer?



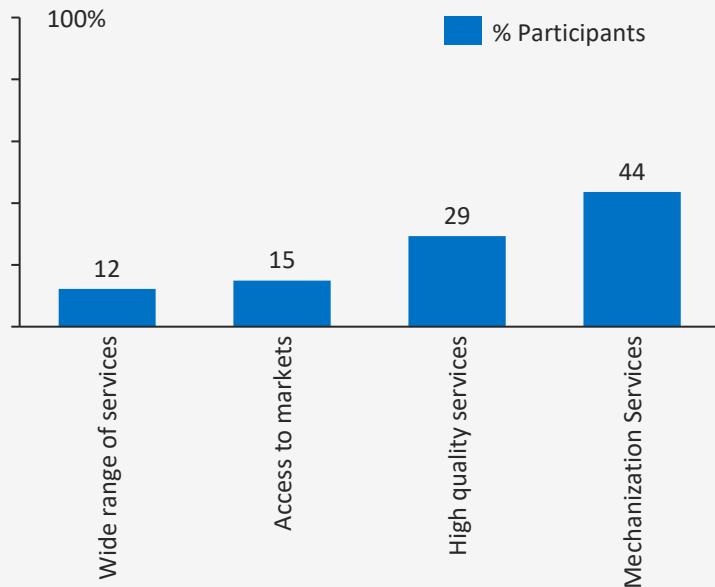
■ Likely    ■ Somewhat likely  
■ Most likely    ■ Very likely

On a total of 202 farmers

- In general, farmers are likely to recommend Afro-Kai to other farmers in the community

## Reason for positive feedback <sup>1)</sup>

Why would you recommend using the services of Afro-Kai?

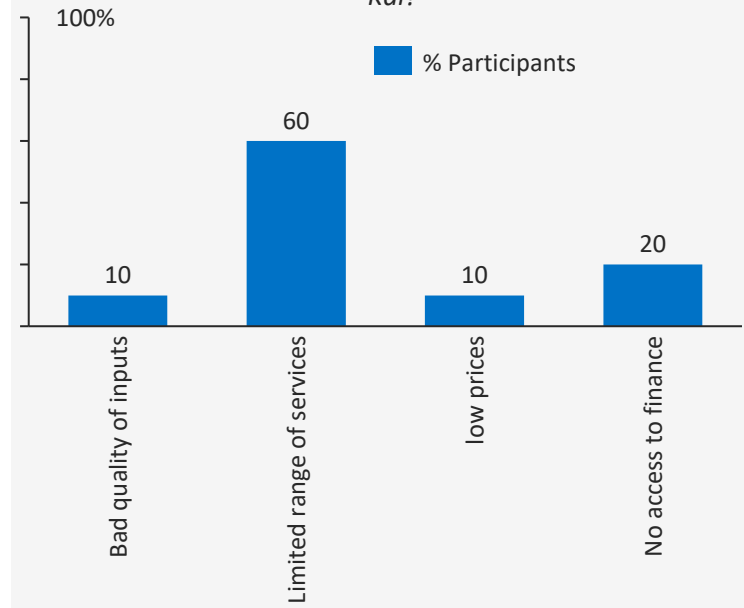


On a total of 188 farmers

- Mechanization and quality services are key in influencing the positive feedback provided by farmers in the SDM

## Reason for negative feedback <sup>1)</sup>

Why would you not recommend using the services of Afro-Kai?



On a total of 10 farmers

- Few farmers who provided negative feedback are of the opinion that Afro-Kai provides a limited range of services.

1) Participants are able to provide multiple answers. % participants of each services in an indication of how many of the surveyed selected that service.

Source: PDC

\*Includes high cost of finance, bad quality of inputs, delayed delivery of seed, bad quality of services among others

# 8.3 Assumptions and methodology

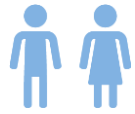
# SDM Level Assumptions

Scale	See <a href="#">Business Case Analysis</a>			
	2022	2023	2024	2025
<b># Farmers</b>	2,000	7,000	10,000	10,000
<b>Sourcing Channels</b>				
Traders	80%	75%	70%	65%
Farmers	20%	25%	30%	35%
<b># Agents</b>	112			
<b>Processing</b>				
Maize weight loss to moisture	7%			
Sorghum weight loss to moisture	2%			
Cleaning capacity (MT/Hour)	75.0	Milling capacity (flour)	1.5	
Machine run hour/day	15.0	Machine run hour/day	15.0	
Days per month	23.5	Days per month	23.5	
<b>Conversion rate</b>				
Cleaning	0.85			
Milling Grade-A	0.65			
Milling Grade-B	0.75			
<b>Exchange rate</b>				
USD > UGX	3,750			

## Farm level assumptions

CHARACTERISTICS	SMALL SCALE		MEDIUM SCALE	
	SDM maize only	SDM maize and sorghum	SDM maize only	SDM maize and sorghum
Total land size (acres)	3	3	5.5	5.5
Maize land size (acres)	2	1	3	3
Sorghum land size (acres)	-	1	-	2
Number of seasons	2	2	2	2
Current yield(kg/acre/season)	1,176	1,176 maize/1,294 sorghum	1,176	1,176 maize/1,294 sorghum
Feasible yield (year 5)	2,105	2,105 maize/1,842 sorghum	2,105	2,105 maize/1,842 sorghum
Current post harvest loss	Y1: 15% > Y5: 5%			
Household consumption	Maize 400 kg/farm/year			
Farm gate price	Sorghum 1,000 UGX/kg / Maize 1,000 UGX/kg/ Value added 1,300 UGX/kg			
<b>FARMER PRACTISES</b>				
Labour	50% family/ 50% hired			
Seeds	Hybrid seeds from FICA seed			
Fertilizer	Applicable			
Finance	12%/year – 680,000 UGX/acre (accessible after 2 years in the SDM)			
Loyalty to Afro-Kai	45% (Y1) > 70% (Y5)			

**IDH has adopted the following definitions to define the extent to which a gender lens has been integrated by partners. IDH aims for all its projects to be intentional and for some to be transformative.**



### Gender unintentional

No steps taken to understand the different needs and preferences of men and women, or target gender gaps/barriers.



### Gender intentional

Considers the different needs and constraints of women and men and takes some steps to create gender equality. Such projects adapt to the needs of women and men without seeking to change gender norms or barriers.



### Gender transformative

Understands the different needs and constraints of women and men and address the root causes of gender inequality. A gender transformative approach needs to foster changes in **individual capacities (agency)**, **gendered norms and expectations (relations)**, and **institutional rules and practices (structures)**.

#### Why we believe investing in women can work for business

- By tailoring goods and services to the needs of women, companies can reach a large and often underserved market, potentially increasing revenues from service provision or enhancing their supply security.
- If women had similar access to and control of productive resources as men, yields of female farmers could increase by up to 30 percent. Higher farm yields and incomes create greater business opportunities for companies working with those farmers.
- Companies that are committed to gender equality outperform their peers. Improving gender diversity in the workplace can improve a company's financial performance by up to 25 percent.
- When companies are seen to invest in gender equality, this has the potential to lead to higher levels of farmer and/or worker loyalty. Conversely, unequal opportunities for women can negatively affect companies' reputations which can lose businesses customers as well as workers.



## IDH developed a methodology and tool to support our clients in their digital journey, including a data base of use cases that can be leveraged to solve key business challenges

*The Digital Transformation Assessment identifies and prioritizes digital opportunities (tech use-cases) that fit an agri-service provider's needs, with ROI estimates. Additionally, through a digital maturity analysis, areas of improvement are suggested for the agri-service provider. Based on the assessment, the tool allows you to match-make with relevant tech-providers.*



### The DTA process

- 1. Introduction with the organization** | Discuss the overall process
- 2. Identification** | Performing the first step of the methodology in the online DTA on the use case database
- 3. Prioritization** | Prioritize the earlier identified use cases from the database based on desirability and feasibility
- 4. Digital Maturity Assessment** | Conduct the Digital Maturity Assessment to distinguish strengths and opportunities for improvement
- 5. Results** | The results include identified and prioritized use cases and DMA analysis with improvement areas