MAKERERE UNIVERSITY

EFFECT OF THE LOCAL SEED BUSINESS MODEL ON ACCESS TO QUALITY CASSAVA PLANTING MATERIALS IN ADJUMANI AND KOBOKO DISTRICTS, WEST NILE, UGANDA

BY

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DECLARATION

This study titled, "Effects of the local seed business model on access to quality cassava planting materials in West Nile, Uganda" is original and has never been submitted by any person for the award of any qualification in any institution of learning.

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This study is dedicated to My Dearest Dad, the late Hajj Abasi Dodo A. Ojale (May Allah have mercy on him), My lovely mother Geria Aisha Abasi, My cherished children Ata Aahil,

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LIST OF ACRONYMS

Abi-ZARDI	Abi Zonal Agricultural Research and Development Institute
AMIFA	Andevuka Mixed Farmers Association

DAO	District Agricultural Officer
DFA	District Farmer Associations
DRC	Danish Refugee Council
EQCC	External Quality Control Committee
IQCC	Internal Quality Control Committee
ISSD	Integrated Seed Sector Development
KFA	Kuluba Farmers Association
LSB	Local Seed Business
NAADs	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
NGO	Non-Governmental Organization
OWC	Operation Wealth Creation
SCT	Social Cognitive Theory
TPB	Theory of Planned Behaviour
UGX	Uganda Shillings

DEFINITION OF KEY TERMS

1.	**Quality cassava planting materials:**	Cassava stem cuttings, free from pests and diseases, with viable nodes, sourced from certified or recognized entities for use in planting.
2.	**Quality declared seed:**	Planting material having optimum moisture content, genetic and physical purity, high germination percentage, and free from noxious weed, other crop seeds and borne diseases.
3.	**Seed certification:**	A formal process confirming that cassava cuttings meet official quality standards for varietal identity, health and viability.
4.	**Seed Quality control:**	Procedures to ensure cassava stem cuttings meet standards for disease-free status, purity, and physical quality throughout production.
5.	**Quality seed:**	Planting material with high viability, purity, and free from disease, capable of producing vigorous plants and high yields.
6.	**Seed:**	In cassava farming, refers to stem cuttings used for propagation rather than botanical seed.
7.	**Inspection:**	Field checks by officials to ensure cassava seed production meets required quality and phyto-sanitary standards.
8.	**Customer satisfaction:**	Farmers' perceptions of how well cassava seed and services from LSBs meet their expectations for quality, availability, and performance
9.	**Local seed business model:**	It is a strategic intervention involving a group of trained farmers organized to produce and sell quality cassava planting materials within the community.
10.	**Effect:**	The measurable change or influence that the Local Seed Business (LSB) model has on farmers' ability to access quality cassava planting materials in terms of availability, affordability and timeliness.

ABSTRACT

Access to quality seed is a cornerstone for agricultural productivity and food security globally, yet smallholder farmers in Uganda continue to rely heavily on uncertified cassava planting materials. This study examined the effects of the Local Seed Business (LSB) model in improving farmers' accessibility to quality cassava cuttings in Adjumani and Koboko Districts of Uganda, focusing on two LSBs: AMIFA and KFA. The specific objectives were: (i) to analyse the implementation process of the LSB model in enhancing seed access; (ii) to assess farmers' perceptions of LSBs as a pathway to obtaining quality cassava planting materials; and (iii) to determine factors influencing farmers' access to cassava seed through LSBs. A mixed-method sequential design was employed, combining qualitative approaches (focus group discussions and key informant interviews) with quantitative surveys administered to 143 respondents. The study found that although LSBs had improved local supply by offering cassava planting materials closer to farmers, their broader impact on consistent and sustainable access to quality cassava planting materials was undermined by weak governance, irregular inspections, poor business orientation, and limited strategic linkages. Only 12.5% of farmers reported regular participation in LSB meetings, while many expressed dissatisfaction with timeliness cassava planting material delivery, communication of seed availability and quality, and supply volumes of cassava cuttings. Farmers' perceptions on the effectiveness of LSBs in enhancing access to quality cassava planting materials, particularly among buyers (both LSB members and non-member buyers), reflected both benefits such as timely and proximate supply, and challenges, such as limited volumes, poor communication, and irregular availability. The logistic regression analysis revealed that access to market information ($\beta = 7.989$, $p \leq 0.001$), availability of credit services ($\beta = 1.927$, $p \leq 0.01$), proximity to LSBs ($\beta = 1.741$, $p \leq 0.05$), and willingness to replace seed ($\beta = 1.522$, $p \leq 0.05$) as significant predictors of farmers' access to quality cassava cuttings through the LSBs. The study concludes that while LSBs play a vital role in bridging the gap between informal and formal cassava seed systems, their current operational and organizational limitations restrict their effectiveness. It recommends strengthening governance structures for LSBs, enhancing their planning and business management capacity, improving market linkages through partnerships with agro-input dealers and extension services, and expanding access to credit and timely information for farmers. Addressing these gaps will enable LSBs to scale up their effectiveness in ensuring the availability, affordability, suitability, and timeliness of cassava seed supply for smallholder farmers, thereby contributing to food security and sustainable agricultural transformation in West Nile, Uganda.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Access to quality seed is a cornerstone for achieving global food security, improving agricultural productivity, and reducing rural poverty (AGRA/CESSA, 2024; de Boef, Thijssen, & Worku, 2025). The global agricultural landscape faces a fundamental challenge of ensuring smallholder farmers have reliable access to high-quality seed, a primary determinant of crop productivity, farm resilience, and rural livelihoods (AGRA/CESSA, 2024; World Bank, 2024). Access to reliable high-quality seed is a core component of food security, poverty reduction, and sustainable development, as emphasized in global frameworks like the Sustainable Development Goals (SDGs) 1, 2, and 8 (FAO, 2023). Despite its recognized importance, the formal, regulated seed sector dominant in developed economies often fails to penetrate the fragmented, low-margin markets that characterize smallholder agriculture in the Global South. This leaves an estimated 80-90% of farmers in developing countries dependent on informal, uncertified seed sources of variable and often poor crops like cassava, potato, and sweet potato, where seed systems are inherently more localised, and less attractive to large-scale commercial seed companies (Andrade-Piedra et al., 2023; McEwan et al., 2024). Access to quality cassava planting materials refers to the ability of farmers to acquire, in a timely, affordable, and convenient manner, sufficient quantities of disease-free, genetically pure, and vigorous cassava stem cuttings that are suitable to local agro-ecological conditions and farmer preferences, thereby enabling improved productivity, food security, and income (adapted from TASAI, 2021; FAO, 2016; & Sperling & McGuire, 2016).

Smallholder farmers in developing countries still face persistent and systemic barriers to obtaining reliable, certified, and high-performing planting materials (Breen, Ndlovu, & Spillane, 2024; Msami et al., 2025). These constraints are especially pronounced for propagated crops like cassava, where the reliance on farmer-saved, recycled, or informally exchanged cuttings often of unknown quality and disease status severely limits yield potential and undermines resilience to climate and pest shocks (Yabeja, Manoko, & Legg, 2025; Wendiro et al., 2022). Access to quality seed is a critical pillar in achieving sustainable agricultural development, improving food security, and reducing rural poverty in sub-Saharan Africa (AGRA/CESSA, 2024; de Boef, Thijssen, & Worku, 2025; Thijssen *et al.*, 2025). Yet, the majority of smallholder farmers in the region continue to rely on informal sources that provide uncertified and low-quality seed, limiting crop yields and exposing them to risks of

disease and low market competitiveness (Breen, Ndlovu, & Spillane, 2024; Yabeja, Manoko, & Legg, 2025; Msami *et al.,* 2025; ISSD Africa, 2022). Despite numerous interventions by governments and development partners, such as seed subsidy programs, extension campaigns, and public-private partnerships, challenges persist in ensuring timely, affordable, and consistent access to improved seed especially for vegetatively propagated crops like cassava, sweet potatoes, and Irish potatoes (Wendiro *et al.,* 2022; UBOS, 2020; Adolwa *et al.,* 2012). Against this background, innovative models such as the Local Seed Business (LSB) were introduced to improve farmer-level access to quality seed in underserved communities.

The Local Seed Business (LSB); the community-based seed production model or farmer-based seed multiplication model, is a strategic intervention for overcoming seed sector challenges in developing countries (FAO & ICRISAT, 2015). The LSBs arise out of the unsatisfied local demand for affordable quality seed, mostly for food crops (Mastenbroek *et al.,* 2017). Shortages in farmers' access to quality seed are more pronounced in Africa, where the failure of formal seed companies to deliver to less profitable niches occupied by rural smallholder farmers creates a quality seed vacuum (ISSD, 2016). Consequently, farmers in Sub-Saharan Africa largely depend on non-specified seed of uncertain quality from the open market or on farmer-to-farmer seed exchange (ISSD, 2016; UBOS, 2020). Thus, the weak capacity and sluggish growth of existing seed systems in Africa prompted the shift to LSBs.

The LSB is a seed business owned by a group of farmers who produce and market quality seed of farmer and market preferred varieties and sustain the business through reinvesting capital and efforts (Mastenbroek *et al*., 2015; Mastenbroek *et al.,* 2017). Studies promote that smallholder farmers can engage in the multiplication of less profitable seeds if linked to researchers to obtain early-generation planting materials (foundation seed), the basic input for any quality seed production (Dawit, 2011; ISSD, 2015). This means that a well-performing LSB consists of entrepreneurs who access foundation seed from research centers or authorized sources and specialize in multiplying and marketing quality-declared seed (Mastenbroek *et al.,* 2017; Andrade-Piedra *et al.,* 2022).

In most cases, LSBs start from the informal sector using entrepreneurial farmers who see business opportunity in producing and marketing quality seed through technical equipment, professional organization, and strategic linkages for commercial sustainability (N2Africa, 2016). Proponents of this model purport that, it is an alternative source of quality seed given its lower unit costs of production and distribution are capable of responding to specific local

demands (Andrade-Piedra *et al.,* 2022). LSBs improve the affordability of seeds (Louwaars and De Boef, 2012); maintain closer ties with farmers, which gives them a clearer understanding of varieties valued by the market (McGuire & Sperling, 2016). Additionally, the locally produced seeds are highly adapted to local contexts and give stable yields (ISSD-Uganda, 2015b).

Reports from Ethiopia, where the model originated in 2010, demonstrate that 39% of teff and barley seed and 47% of lentil seeds produced nationwide in 2009/10 were from LSBs, in the first year the model was introduced (Dawit, 2011). In addition, of the total 63 varieties produced in 2010 by the Ethiopian seed enterprise, 44 varieties were also produced under the LSBs (Dawit, 2011). Several studies done in Uganda also show that LSBs can recover invested cash into seed production in two growing seasons of focusing on seed production and marketing (Dawit, 2011; Mbowa and Mwesigye, 2016; Mastenbroek *et al.*, 2017).

Local seed businesses are the best-suited economic strategy for improving smallholder farmers' access to quality seed. It is reported that, LSBs have the potential to produce and support farmers' access to the much-appreciated seed of good quality (ISSD-Uganda, 2015b). However, field reports suggest otherwise. Studies by N2Africa (2016) showed that seeds obtained from LSBs have poor germination, in the range of 0% to 10%, despite having obtained excellent quality certification marks. In addition, the close-up report for the piloting of the LSB model in Northern Uganda showed that farmers growing beans, cassava, and sesame did not source seed for these crops from LSBs even when they were actively operating in their neighbourhoods (Masterwork *et al.,* 2017). Many of these studies point to challenges in the operational mechanisms of the LSBs, and they all suggest the importance of paying attention to LSB performance (N2Africa, 2016).

Cassava was selected as the study crop because it is an important staple food for communities in West Nile, yet its quality and quantity have been declining in recent years, (Wendigos *et al.,* 2014). This implies that LSBs were a more suited intervention to improve access to quality cassava planting materials enabling improved productivity, food security, and income (FAO, 2016; & Sperling & McGuire, 2016: MAAIF, 2018). Besides, cassava is one of the 12 priority crops targeted for agro-industrialization (NDP III, 2020; UBOS, 2020). The crop is an economic source of starch needed in processed food, feed, and sweeteners for industrial products (Graff ham *et al.,* 2017; Shabo & Li, 2017; Henan, 2021). However, cassava yield in Uganda remains poor and cyclic, featuring increments and decrements due to the recycling of planting materials (UBOS, 2020). Thus, knowledge of how cassava based LSBs could

improve their performance to deliver quality planting materials can improve the food security and incomes of smallholder farmers (McEwan *et al.*, 2022; Namazi *et al.*, 2021).

1.2 Problem Statement

Local Seed Businesses (LSBs) are promoted globally as a community-based strategy to address the persistent gap in smallholder farmers' access to quality seed, particularly for vegetatively propagated, staple food crops in underserved regions (ISSD, 2013; IITA, 2015). In Uganda, this model has been implemented to improve the supply of clean cassava planting materials, which is vital for combating yield-limiting diseases like Cassava Mosaic Disease and enhancing food security (MAAIF, 2018). However, LSBs face significant operational challenges. Studies report issues such as inconsistent quality control, weak business orientation, and irregular seed supply, which compromise their effectiveness (Wendiro et al., 2022; Akimbo et al., 2021). Furthermore, farmer perceptions regarding the cost, reliability, and performance of LSB seed critically influence adoption, eventually limiting the seed buying behaviour (TASAI, 2015; Adongo & Mwaura, 2019).

However, in Uganda, the actual utilization of LSBs for cassava seed distribution remains limited and access to quality cassava planting materials remains a critical, barrier to improving productivity, food security, and incomes for smallholder farmers in Uganda's West Nile sub-region. While cassava serves as a primary staple crop, farmers' reliance on recycled, informally sourced, and often diseased cuttings perpetuates a cycle of low yields and vulnerability to Cassava Mosaic and Brown Streak Diseases (Otim et al., 2022; UBOS, 2020). For instance, despite multiple efforts to strengthen community seed systems, only about 2% of farmers in the West Nile region accessed cassava planting materials from LSBs, pointing to a persistent disconnect between the model and grassroots uptake (Mulesa *et al.*, 2024). Even in districts like Adjumani and Koboko where functional LSBs exist, recent assessments continue to show low access and weak supply of cassava seed through these local networks (ISSD, 2021).

The LSB model faces technical, organizational, and market-related weaknesses including poor seed quality, disease-infected planting materials, limited business orientation, and negative farmer perceptions—which collectively undermine seed reliability, reduce yields, and threaten both adoption and the long-term viability of farmer-led seed enterprises (Wendiro et al., 2022; Otim et al., 2022; UBOS, 2020; de Oliveira et al., 2020; Akimbo et al.,

2021; Kumar et al., 2022; Fanout et al., 2018; TASAI, 2015; Adongo & Mwaura, 2019; Muigai et al., 2010; Weary, 2013).

Despite these concerns, little is known about the underlying reasons for the limited uptake of cassava planting materials through LSBs in West Nile. Given that LSBs are embedded in farmer organizations and shaped by local social and institutional dynamics, their performance is likely to be highly context-specific. Therefore, this study seeks to investigate this gap by analysing the implementation of the LSB model, assessing farmer perceptions, and determining the factors that influence access. The findings of this study will provide actionable insights for strengthening LSBs to fulfil their potential as a viable pathway to quality cassava planting materials in West Nile, Uganda.

1.3 Objectives of the study

1.3.1 Overall objective

The overall objective of the study was to assess the effect of the local seed business model in enhancing farmers' access to quality cassava planting materials in Adjumani and Koboko districts, West Nile, Uganda. The aim was to generate evidence to inform strategies for improving seed system performance, farmer adoption, and sustainable access to quality seed at the grassroots level.

1.3.2 Specific objectives

The specific objectives of the study were to:

1. Analyse the current implementation of LSB model in the production and marketing of quality cassava planting materials in Adjumani and Koboko districts.
2. Assess farmers' perceptions towards the LSB model as a pathway for accessing quality cassava planting materials.
3. Determine factors influencing farmers' access to quality cassava planting materials through the LSBs in Adjumani and Koboko districts.

1.4 Conceptual framework

In analysing LSB performance, the study relies on the four pillars that characterize a well-functioning Local Seed Business (LSB) (ISSD-Uganda, 2015c; ISSD, 2016). Ideally, an LSB that performs well should: 1) be technically equipped (following quality seed control procedures, processing, and adding value); 2) be market-oriented (implements a marketing strategy and mechanisms for customer feedback; 3) be professionally organized (possesses governance policies and resource mobilization capabilities); and 4) Strategic linkages (have access to inputs, services, and markets. Conceptually, the effect of LSBs (dependent variable) is influenced by socio-economic factors and farmers' perceptions of LSBs (independent variables), which together shape access to planting materials, as illustrated with dotted lines, (Figure 1.1)

In addition, access to support services; including peer networks, training, credit and market information have been found to be vital in explaining seed access (Wegary, 2013 Mulugo, 2021). Farmers may not access planting materials of LSBs, if the crop is not very important to them or where their inclination is to locally recycled varieties (Habte *et al.,* 2010; Ndaula *et al.*, 2021). Beyond farmers' perceptions, there are socio-economic factors (age, sex, education, income level, availability of labour, size of land, participation in social networks) that influence access to quality planting materials (FAO, 2016; Mulugo *et al.,* 2021). These factors conjointly were hypothesized to positively affect farmer access to planting materials through the LSB.

Drawing on the theoretical processes outlined by the action theory and conceptual theory (Chen, 1990; MacKinnon, 2008; MacKinnon et al., 2012), the conceptual framework for this study illustrates how Local Seed Businesses (LSBs) influence farmers' access to quality cassava planting materials. According to action theory, the design and implementation of LSB interventions are expected to influence key mediating factors specifically farmers' perceptions and socio-economic conditions while conceptual theory explains how these mediators subsequently shape the final outcomes of interest, namely the performance and effectiveness of LSBs.

Guided by the seed security assessment framework (FAO, 2016), this study conceptualizes access to seed as both a behavioural and outcome phenomenon (Campbell et al., 1993; Sonnentag & Frese, 2003), shaped by what individuals think, believe, and feel (Ajzen, 1991; Silva & Dias, 2008; Ndaula et al., 2020). In this regard, farmers' perceptions of seed quality,

seed availability, suitability of varieties, pricing, timeliness, proximity, and profitability (Andrade-Piedra et al., 2016; Bentley et al., 2018; Mulugo, 2021) are treated as central mediators influencing their willingness and ability to acquire cassava planting materials from LSBs.

Socio-economic characteristics which include age, sex, education, income, labour availability, land size, and social network participation—also function as key mediating variables affecting farmers' access to LSB seed (Habte et al., 2010; FAO, 2016; Ndaula et al., 2021; Mulugo et al., 2021). Access to complementary support services such as credit, training, peer networks, and market information further strengthens this relationship (Wegary, 2013; Mulugo, 2021).

Anchored in the ISSD framework for a well-functioning Local Seed Business (ISSD-Uganda, 2015c; ISSD, 2016), the dependent variable—LSB performance—is conceptualized along four pillars; Technical capacity (quality seed production, processing, and value addition), Market orientation (marketing strategies and customer responsiveness), Professional organization (governance structures and resource mobilization), and Strategic linkages (access to inputs, services, and markets).

The conceptual framework therefore proposes that farmers' socio-economic factors and perceptions (independent variables) jointly determine their access to quality cassava planting materials, which in turn influences the performance and effectiveness of the LSB model as depicted in Figure 1.1.

Access to planting materials in LSB was seen as a binary outcome variable (purchased materials from the LSBs = 1; otherwise = 0). Therefore, this study aimed to answer the following research questions that corroborate to the specific objective: 1) how does the implementation of the LSB model facilitate production and marketing of quality cassava seed? 2) What perception do farmers hold towards the efficacy of the LSBs in enhancing access to quality cassava planting materials in Adjumani and Koboko districts? And 3) how do the socioeconomic, psychological and demographic characteristics of the farmers facilitate or hinder farmers' access to quality cassava planting materials through the LSBs?

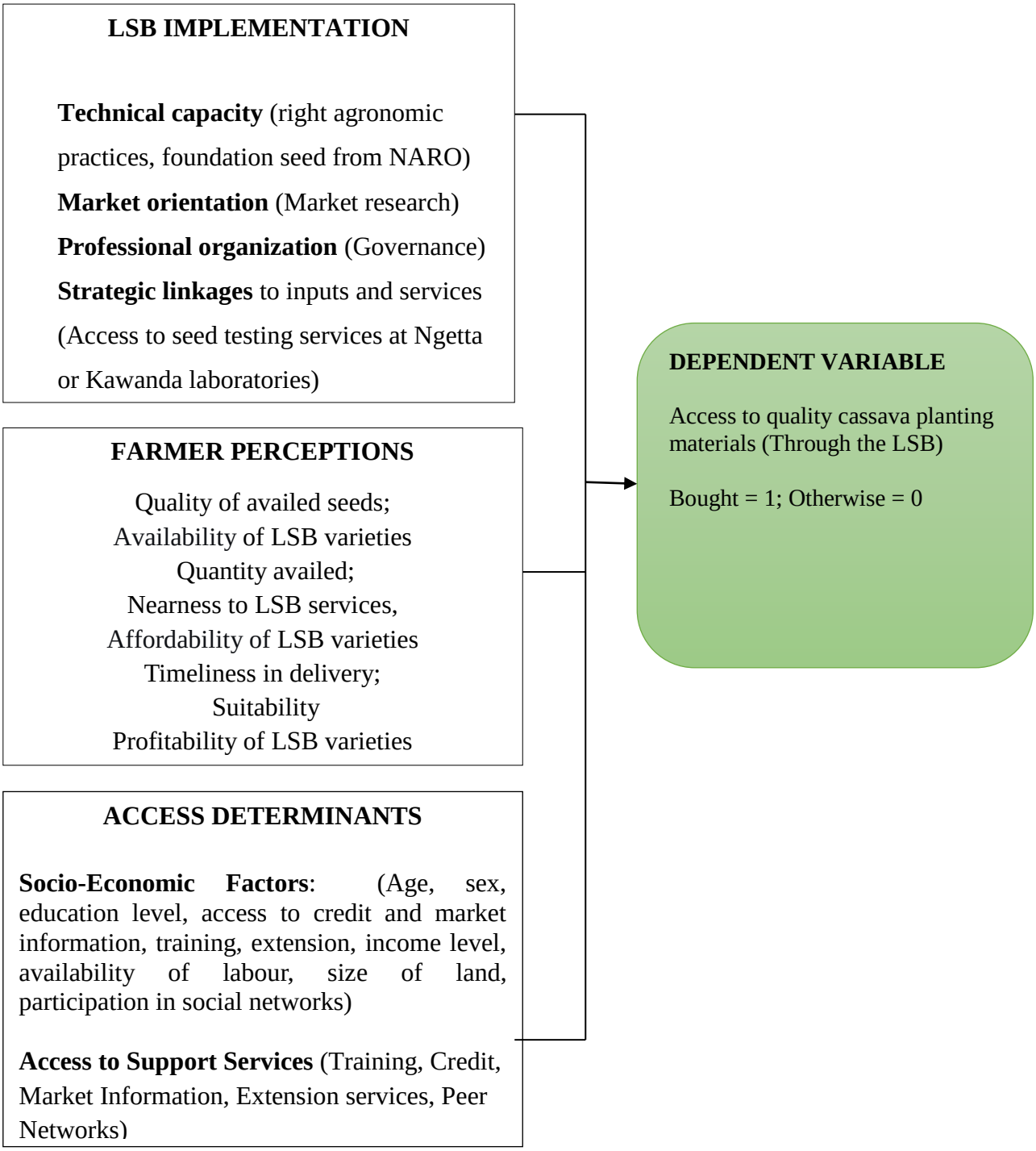

Figure 1.1: Conceptual framework for of the study.

1.5 Significance of the study

This study brought out two sets of outputs. First, it identified the activities that would result into market-led production and delivery of seed are weakly pursued by the LSBs prior to making choices regarding the foundation seed to multiply. This has affected the LSBs' understanding of varieties and quantity demanded of seed. Second, this study highlights some factors, such as access to market information and extension services, and the relative

location of the farmers (proximity) to the LSB, which were revealed to be important for the success of LSB. The finding regarding strengthening the marketing component is an important input for the practitioners, change agent organizations and policy makers with interest in strengthening the seed system through the LSB model. Policy makers and change agents could also use the factors highlighted to improve farmers' access to seed. Thus, the outputs of this study could aid in designing strategies that enhance the production and dissemination of quality cassava planting materials in West Nile. They are also likely to favour the current policy debate regarding the decentralization of seed systems which can sustainably create seed secure communities by scaling out of the LSB model. The findings of this study will be insightful in the attainment of Sustainable Development Goals (SDGs) 1; which targets poverty reduction, SDG 2: ending hunger, achieving food and income security, improving nutrition, and promotion of sustainable agriculture; and SDG 8: focusing on decent work and economic growth which is essential for income stability and reducing vulnerability to food insecurity especially in sub-Saharan Africa.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

The literature presented in this chapter is as a result of targeted search done in physical and digital libraries, using the sub-components of the conceptual framework, (Fig. 1.1). This chapter is concerned about the synthesized output of related literature, presented in five major sections: 1) Description of a seed system; 2) emergence of the LSB model and the status of farmers' access to cassava planting materials (problem variable); 3) description of well-performing LSB model (related to objective 1); 4) known farmers' perceptions towards the informal seed access pathways (objective 2) and; 5) factors known to influence farmers' access to seed through LSB models (objective 3).

2.1 Seed systems

Seed systems are the nucleus of agriculture, supplying the essential agricultural input (Otieno et al., 2023; Alemu & Spielman, 2023). They form the foundation for agricultural development (McEwan et al., 2024; ISSD Africa, 2023). Notably, over 50% of the World Bank's 191 projects promoting sustainable agriculture, worth $513 million, include a seed systems component (World Bank, 2024). Seed systems encompass a variety of institutions and individuals involved in activities such as development, multiplication, processing, storage, and distribution of seeds (Andrade-Piedra *et al.*, 2023; ISSD Africa, 2023).

2.1.1 Evolution of a seed system and categories of seed systems

A seed system evolves through four phases (ISSD Africa, 2023; Alemu & Spielman, 2024). Phase 1: Predominantly informal, where farmers save their own seeds or obtain them from nearby farmers, with low new varietal development and adoption rates. Phase 2: Introduction of improved varieties developed by publicly funded research, with an emerging private sector involved in seed multiplication and distribution. Phase 3: Active private sector role in research and development, particularly for hybrids and specialized cash crops, with varied and decentralized seed distribution systems. Phase 4: Well-developed agricultural sector with effective seed laws, established linkages among actors, and widespread use of improved seeds. Seed systems are categorized into formal, intermediary, and informal, which usually coexist (Otieno *et al.*, 2023; McEwan *et al.*, 2024). A well-functioning seed system uses an appropriate combination of all these systems to meet farmers' evolving demands for quality seeds

2.1.1.1 The formal seed system

The formal seed system is regulated by governments and industry (Mburu *et al.,* 2023), focusing on breeding, producing, and selling certified seeds. It offers improved varieties of consistent quality and relatively high purity (ISSD Africa, 2023). Formal systems involve many institutions, including government, private seed companies, member associations, development agencies, and farmer cooperatives. In many developing countries, the formal seed system is underdeveloped or focuses on the most profitable crops (Otieno *et al.,* 2023; Andrade-Piedra *et al.,* 2023; World Bank, 2024).

2.1.1.2 The Informal Seed System

The informal seed system involves unregistered producers in seed production, processing, marketing, and distribution (Almekinders *et al.,* 2023; Rutta *et al.,* 2024). It operates at individual or community levels without government regulation (Musoke *et al.,* 2023), guided by local technical knowledge, social structures, and norms (Kansiime *et al.,* 2024; Mudege *et al.,* 2023). Farmers rely on social networks for seed transactions, often in the form of cash, exchange, or gifts (FAO, 2023; Mulesa *et al.,* 2024). This system, which accounts for over 87% of seed use, is vital for many rural farmers (CIAT & ISSD Africa, 2023).

2.1.1.3 Intermediary seed systems

The intermediary seed system bridges the formal and informal systems (Mudege *et al.,* 2024; Mulema *et al.,* 2023). It involves farmers or farmer groups producing quality seeds while collaborating with formal sector actors. This system is particularly suitable for many Sub-Saharan African countries (FAO, 2023) and is increasingly accepted by development programs due to the limitations of other sectors (Rutta et al., 2024; ISSD Africa, 2023).

2.2 Local Seed Business Model

Local Seed Businesses (LSBs) exemplify an intermediary seed system (Mukankusi et al., 2023). LSBs play a crucial role in the agricultural sector by aiming to provide farmers with access to quality seeds of locally preferred crop varieties (Sperling & McGuire, 2023). These businesses bridge the gap between formal and informal seed systems, thereby enhancing the availability and accessibility of improved and locally adapted seeds to smallholder farmers. By doing so, they contribute significantly to the resilience and productivity of agricultural communities (FAO & WFP, 2023)

The establishment of LSBs addresses a critical need in the seed supply chain. Often, the formal seed sector, dominated by large commercial companies, fails to reach remote or less profitable markets. On the other hand, informal seed systems, while widespread and crucial for many smallholder farmers, often lack the quality assurance and variety diversification needed to improve crop yields and resistance to pests and diseases. LSBs, operating at a local level, can cater specifically to the demands of their immediate communities, ensuring that the seeds provided are not only of high quality but also suited to the local agro-ecological conditions and cultural preferences.

Furthermore, LSBs support the local economy by creating jobs and fostering entrepreneurship within rural areas. They often involve local farmers in seed production, processing, and distribution, which helps build local expertise and ensure that the benefits of seed sales stay within the community. This model promotes a more sustainable agricultural practice, where the focus is not merely on the profitability of seed sales but also on the overall development and resilience of the farming community.

LSBs also play an educational role, providing farmers with the knowledge and training needed to maintain seed quality and adopt improved agricultural practices. This knowledge transfer is crucial in enhancing the overall productivity and sustainability of farming systems. By facilitating better access to quality seeds and the necessary agronomic knowledge, LSBs help farmers achieve higher yields, improve food security, and increase their incomes.

2.2.1 Goal of the Local Seed Business Model

The LSB model is a strategic intervention recently adopted by development programs to address seed sector challenges in developing countries (FAO & KIT, 2024). This innovative approach was initiated, developed, and formalized by the Centre for Development Innovation (CDI) at Wageningen University through the Integrated Seed Sector Development (ISSD) program (van der Burg *et al.,* 2023). The primary goal of the LSB model is to enhance the delivery of 'seed' related technologies developed by researchers to farmers, particularly those in remote regions (Mukankusi *et al.,* 2023; Sperling & McGuire, 2023; FAO & WFP, 2023). Operating parallel to the formal seed system, the LSB model aims to meet the seed demands of smallholder farmers in developing countries (Kansiime et al., 2024).

The need for the LSB model arose due to the weak capacity of existing formal seed systems in many African countries, including Uganda, to penetrate informal 'seed' networks. These informal networks are crucial for smallholder farmers who continue to rely on them for

accessing 'seed' (Lipper *et al.,* 2024). By operating alongside the formal seed system, the LSB model seeks to bridge this gap and ensure that high-quality seeds reach farmers in remote areas, thereby improving agricultural productivity and sustainability.

2.2.2 Benefits of the Local Seed Business Model

LSBs reduce transaction costs for both suppliers and farmers. Since the seeds are produced locally, they are highly adapted to local growth conditions and yield stable results (Abate *et al.,* 2023; ISSD Africa, 2021). Additionally, LSBs maintain close relationships with farmers, ensuring that the produced crop varieties are those most valued by the farmers (Van Etten *et al.,* 2020). Consequently, seeds produced by LSBs improve timely availability, accessibility, affordability, and dissemination to farmers (Otieno *et al.,* 2022).

2.2.3 Theory of change for Local Seed Business Model

The LSB model aims to organize farmer groups for technical seed production and legally support them in running functional seed business enterprises (Kuhlmann *et al.,* 2022). A typical LSB consists of smallholder farmers who produce and market quality seeds for both personal use and for sale. LSBs operate as sustained social enterprises, where members invest in the seed business and reinvest financial gains to ensure seed security for the farming community (Miiro *et al.,* 2021). This model is particularly relevant in countries like Uganda, where the formal seed sector focuses primarily on high profit crops with high multiplication ratios, such as hybrid maize, and often neglects essential food crops that are self-pollinated (e.g., beans, groundnut, and soybean) or propagated through vegetative methods (e.g., vines, stem cuttings, and suckers) (Amah *et al.,* 2023; de Boef *et al.,* 2022).

2.2.4 Description of well-performing Local Seed Business model

Theoretically, a well-performing LSB is driven by four pillars (Table 2.1) namely: Technical equipment (quality seed production, processing and value addition); Market orientation (market strategy and customer feedback mechanisms); Professional organization (governance, resource mobilization and utilization); and Strategic linkages (access to inputs, services, and markets), (ISSD-Uganda, 2015c; ISSD, 2016). ISSD has further broken down each of these pillars into underlying factors, resulting in eight success factors used as indicators for a well-performing LSB (ISSD-Uganda, 2015c; ISSD, 2016). Table 2.1 summarizes the LSB pillars and their underlying success factors.

Table 2.1: Key features of a local seed business

LSB Pillars	Success factors
Technically equipped	Quality seed production Processing and value addition
Market oriented	Market strategy Customer feedback mechanisms
Professionally organized	Governance Mobilization and use of resources
Strategically linked	Access to inputs and services Access to markets

Source: ISSD-Uganda, 2015c

A well-functioning LSB is dependent on the collective contribution of all the four pillars that characterize the LSB (Figure 2.1). A performing LSB is mainly assessed on two parameters: 1) the community it serves with seed and; 2) the volume of the planting material marketed through LSBs (ISSD, 2015).

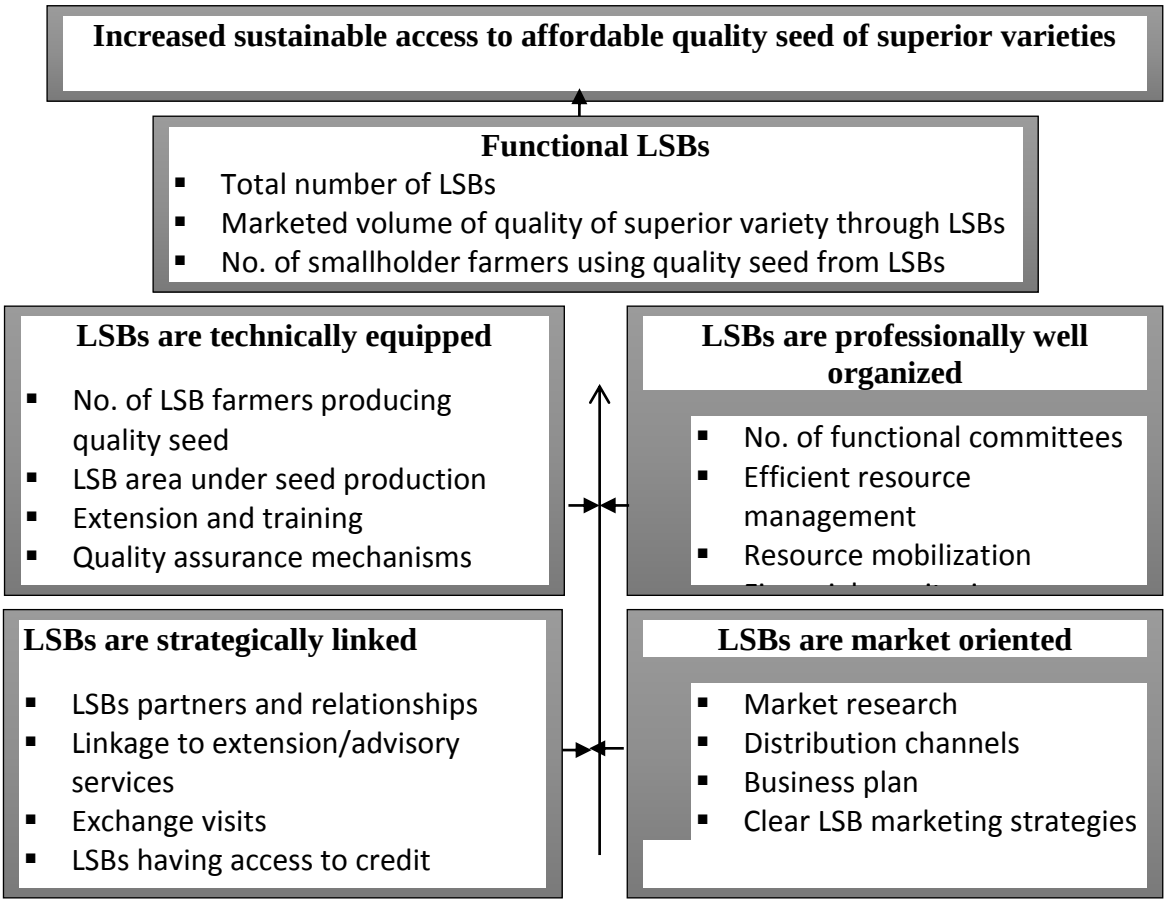

Figure 2.2: Flow of activities in the functioning of a LSB (Source, ISSD, 2015)

2.2.5 Technical equipment of the LSBs

This entails having the capacity for the production of quality seed and to add value to the products. The core concern for this pillar is on seed quality assurance. The standards are often set by the formal seed sector officials whereas seed quality assurance is a joint effort through quality control teams involving a series of actors at different administrative levels (ISSD-Uganda, 2015c). Figure 2.2, shows the lengthy idealized quality assurance procedures that are supposed to be followed by LSBs in the process of producing quality seed. The core indicators for this pillar include LSB groups producing quality seed, LSB area under seed production, extension and training and quality assurance mechanisms.

Figure 2.3: Flow of activities for LSBs in producing quality seed.

Source: Guidelines for producing quality declared seed (ISSD-Uganda, 2015)

2.2.6 Market orientation

An LSB has marketing capacity, including assessing markets and developing products that are on demand and satisfying customer needs. This also includes listing the dissemination mechanisms for the LSBs. In order to do so the LSBs need a business plan.

2.2.7 Professional organization of the LSBs

This relates to how well the business is organized. It looks at general organizational, financial management, and infrastructural development. The principles relate to decision making, participation, communication, task division, coordination and specialization in teams like the; quality control, marketing, farm management and monitoring committees. The administrative structure of the LSBs comprises of the general assembly, executive committee and sub-committees. The sub committees include: Production; Seed quality control; Finance, marketing, sales and customer care.

2.2.8 Powers and Functions of the LSB Committees

a) The Executive committee: Defines the vision, strategic objectives and policies of the LSB, and ensure that their plans are in conformity with existing policies. They; review business plans & budgets before presenting to the Annual General Meeting (AGM); supervise the execution of approved plans; mobilize resources for the LSB on behalf of the members; appoints, appraises and disciplines members and monitors activities of the sub-committees.

b) The Sub committees:

(i) **Production committee:** Makes production plans; ensures proper agronomic practices for maximum yield with the quality control committee; takes lead in crop processing and sorting and handles post-harvest exercises.

(ii) **Seed quality control committee:** Looks for quality source of seed for planting; ensures that proper agronomic practices are followed. It inspects the LSB field for right isolation distance, pest and disease identification.

(iii) **Marketing, sales and customer care:** Takes lead in drawing a marketing plan; conducts market research on behalf of the LSB, calculates profit for the enterprise and shares the results with the group; negotiates with buyers on behalf of the LSB members; makes marketing visits, presents and reports to the rest of the members.

(iv) Finance and Audit: Guides the group in financial management matters, identifies and mobilizes resources required like share capital membership and subscription fees.

2.2.9 Strategically linked

The pillar is concerned with the connectivity of the LSBs to relevant input and service for the achievement of its specific capacity needs and business plan goals. The essential links include germ plasma, fertilizers, pesticides, seed certification, finance, information, technologies, water and electricity, legal rights and lobbying. The ZARDIs and other development partners support and implement the LSB model. Joint participatory action planning ensures that partner organizations integrate capacity development activities and concerns of the LSB into their work plans. These commitments are affirmed by signing the partnership agreements.

2.3 Local Seed Business Model in Uganda

According to a document from 2015, the Integrated Seed Sector Development (ISSD) Uganda program began in 2012 and initially covered three agro-ecological zones: Western, Northern, and West Nile. By 2013, the program had successfully established 30 Local Seed Businesses (LSBs) comprising around 900 members across these regions. The program closely collaborates with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the Zonal Agricultural Research and Development Institutes (ZARDIs), which provide both technical support and entrepreneurial training to the LSBs. Furthermore, multi-stakeholder platforms at district and regional levels play a key role in identifying challenges faced by LSBs and mobilizing coordinated responses to overcome them.

2.4 Local Seed Businesses and access to cassava 'seed' in Uganda

In Uganda, cassava has emerged as a potential crop within the niche and portfolio of LSBs. Preceded by banana and maize, cassava is the third most important staple food crop (UBOS, 2023). Its propagation mainly relies on stem cuttings, but it also has the ability to set variable seeds, making the extension of 'cassava seeds' through the formal seed system less likely (Muli *et al.*, 2022). Consequently, farmers have not been able to fully benefit from advances in cassava seed research and delivery programs (Tumuhimbise *et al.*, 2022). The dual characteristics of cassava its ability to adapt to various climatic conditions and the logistical ease of transporting its bulk vegetative propagation materials from distant multiplication centers underscore its significance as a widely cultivated crop (ISSD, 2021).

In theAdjumani and Koboko districts, region, where cassava ranks as the most important food crop (Wendiro et al., 2023), its productivity remains low due to diseases such as cassava mosaic disease and cassava brown streak disease (Otim *et al.,* 2022; Abaca *et al.,* 2022). These diseases could be mitigated through the cultivation of resistant varieties. However, some cassava varieties, like 'Mingoro' and 'Palawu', are heavily affected by CMD and CBSD, making the spread of these diseases through infested planting materials a significant concern (Bwayo *et al.,* 2021). CMD and CBSD are systemic diseases, meaning that by the time symptoms are visible in the leafy parts, the stem would have already been infected and thus unsuitable for use as planting material. Therefore, the use of quality cassava cuttings is crucial for controlling CMD and CBSD in the West Nile region. The establishment of LSBs in West Nile was expected to enhance access to quality cassava cuttings; however, despite the presence of LSBs, access to quality cassava planting materials or cassava 'seed' free from disease remains low in the West Nile sub-region (ISSD, 2021). The irregular supply of planting materials through LSBs, such as the reduced quantity of cassava stems available on the market during specific seasons, affects their accessibility (Wendiro *et al.,* 2023). Consequently, many farmers continue to rely on planting materials from previous seasons or obtain them from fields of peer farmers within their social networks.

2.5 Access to quality cassava planting materials

Seed access is a multidimensional concept comprising six key dimensions: availability, affordability, suitability, capability, profitability, and autonomy (TASAI, 2021). Availability refers to the timely and reliable presence of seed in adequate quantities and within accessible proximity to farmers, particularly during critical planting seasons (Kabunga *et al.,* 2022). Affordability concerns the ability of farmers to acquire seed at fair and manageable prices, which can be supported through credit schemes and subsidized input programs often facilitated by governments or development partners (FAO, 2021; Rajendran *et al.,* 2020). Suitability highlights the importance of breeding improved varieties tailored to the local agro ecological context and farmer preferences, such as taste, maturity period, and disease resistance (Mutoni *et al.*, 2023). Capability relates to the extension services and training that support farmers in making informed seed-related decisions, including agronomic guidance and feedback mechanisms (Dada *et al.,* 2020). Profitability examines the net gains farmers derive from using improved seed, including increased yields and market opportunities (TASAI, 2021). Finally, autonomy underscores the value of diverse seed sources, enabling farmers to choose based on trust, performance, and accessibility, thereby reducing dependence on a single provider (Kabunga *et al.*, 2022)

2.6 Dissemination of cassava planting materials

Cassava distribution and marketing involve several interconnected functions, including logistical operations such as transportation and market research, promotional activities like field demonstrations and advertising, and buying and selling functions associated with wholesaling and retailing, as well as facilitating functions like risk-bearing and financing (AGRA, 2021; Kayondo *et al.,* 2022). Cassava seed distribution and marketing can be undertaken by government agencies, private seed dealers, or local community-based organizations (Munyua *et al.,* 2020; Gichuki *et al.,* 2023; SNV, 2019; Otim *et al.,* 2022). According to Kalibwani and Ahumuza (2021) and GIZ (2021), problems such as over-centralization, poor management, and high production costs are common in public seed distribution systems, often resulting in losses, late delivery, deterioration in seed quality, and unmet seed demand in remote areas. Decentralized seed distribution systems are often more efficient because they focus their operations on commodities and areas where there is a strong and assured demand (Wendiro *et al.,* 2022; ISSD-Uganda, 2021).

2.7 Farmers' cassava 'seed' sources in developing countries

On average, approximately 80% of farmers in developing countries utilize seeds from informal sources (ISSD-Uganda, 2015e). Common sources include saved seeds, local markets, and exchanges among peers (FAO, 2016). Farmers often buy or exchange seeds with others when they need to replenish their stock (Wegary, 2013; Gonfa, 2015). Seed exchanges typically occur within kinship ties or nearby neighbourhoods. According to a study by Kristin (2015) on technology dissemination in Meru, Kenya, important sources of information on quality seeds for both farmer groups and individual farmers include extension services, community meetings, agricultural programs, other farmers, and places of worship.

2.8 Farmers perceptions on seed access through the various seed systems

Recent studies emphasize that farmers' perceptions towards seed systems are heavily influenced by seed quality assurance and expected yield performance (Mutonhi *et al.,* 2021). Farmers consider attributes such as germination rate, yield potential, early maturity, and disease resistance as key indicators of quality, which directly affect their willingness to adopt seeds from a given system (Turyagyenda *et al.,* 2022). These perceptions are further shaped by factors like seed availability, affordability, and perceived profitability (Ajayi *et al.,* 2023).

Socioeconomic characteristics such as age, gender, education level, and income also significantly influence farmers' attitudes toward improved seed technologies. Younger

farmers tend to exhibit a greater openness to innovation compared to older ones, driven by a higher likelihood to experiment and invest in new farming enterprises (Mulema *et al.,* 2021). According to Moyo *et al.* (2023), farmers with higher education levels are more likely to evaluate seed attributes critically and make informed decisions about seed sourcing.

However, scepticism remains around the quality of farmer-multiplied seeds. A common perception is that seeds produced by peers are of lower quality than those from research institutions or formal seed companies, this discourages farmers from paying premium prices for such seeds (Dione *et al.,* 2020). Building trust through transparent quality assurance and certification processes is critical to enhancing the credibility of local seed enterprises.

2.9 Factors affecting farmers' access to quality seeds

FAO and ICRISAT (2015) categorized the factors influencing the effectiveness of seed-producing entities into external and internal factors. External factors those beyond the control of seed producers include government, NGO policies and programs, which significantly affect service delivery and the broader enabling environment for seed producers (Ajayi *et al.,* 2023). Demand side actors, also influence seed production activities through farmer preferences and purchasing behaviour. Studies indicate that socio-economic and demographic characteristics of seed buyers such as income, education level, and household size play a critical role in determining access to quality seeds (Mulema *et al.,* 2021; Moyo *et al.,* 2023).

Gender remains a key variable; recent evidence supports earlier findings by Amri and Kimaro (2010), showing that male farmers are more likely to access quality seeds due to greater mobility and control over resources compared to female farmers (Turyagyenda *et al.,* 2022). Other demographic and economic determinants of seed access include age, education, landholding size, irrigation availability, soil quality, and access to extension or training services (Mutonhi *et al.,* 2021; Dione *et al.,* 2020).

In addition to structural barriers, perception and institutional dynamics shape seed access. Farmers often rely on informal or indigenous networks due to limited exposure to formal distribution systems and ineffective promotion of quality seeds (Wendiro *et al.,* 2022). Poorly targeted awareness campaigns and underdeveloped distribution channels constrain seed uptake, especially in rural areas (ISSD, 2021). Price also remains a critical factor high costs associated with improved seed varieties deter many smallholder farmers, pushing them to resort to saved or exchanged seeds (Giller *et al.,* 2020). Other barriers such as distance to

markets, limited input outlets, and lack of access to credit services further restrict seed accessibility (TASAI, 2022; Kansiime *et al.,* 2021).

2.10 Literature Summary

The literature establishes the Local Seed Business (LSB) model as a robust intermediary strategy designed to bridge the gap in smallholder farmers' access to quality seed, particularly for staples like cassava. Its proposed strength lies in a four-pillar framework technical capacity, professional organization, market orientation, and strategic linkages, which aims to deliver planting materials that are timely, affordable, locally adapted, and of assured quality (ISSD-Uganda, 2015c; Abate et al., 2023). For cassava, a crop whose productivity is severely constrained by systemic diseases and an underdeveloped formal seed sector, the LSB model is promoted as a vital mechanism for disseminating clean, resistant planting materials to improve food security and rural incomes (Otim et al., 2022; McEwan et al., 2022). However, a significant disconnect exists between this theoretical model and its practical implementation and reception on the ground. While project documents outline ideal operations, field reports and preliminary studies reveal recurrent challenges, including weak quality assurance, poor governance, and limited market outreach that undermine LSB performance and farmer trust (N2Africa, 2016; Mastenbroek et al., 2017). Furthermore, there is a critical lack of contextualized evidence on how farmers in specific regions like West Nile shaped by refugee dynamics and cross-border trade perceive these businesses, and an integrated understanding of what factors collectively determine whether farmers successfully access seeds through them is missing (Adong & Mwaura, 2019; Mulema et al., 2021). This study directly addresses these gaps by investigating the LSB model as it functions in practice. It moves beyond prescription to analyze how the four pillars are implemented in the cassava-based LSBs of Adjumani and Koboko districts, assesses the resulting perceptions of efficacy among farmer beneficiaries, and models the combined influence of institutional, perceptual, and socio-economic factors on actual access. The findings could thus generate actionable, context-specific evidence to explain the current performance of LSBs and provide a grounded blueprint for strengthening their role in building sustainable, community-led seed systems in Uganda and similar regions.

CHAPTER THREE: MATERIALS AND METHODS

3.1 The study area

The study was conducted in Koboko and Adjumani Districts of West Nile Sub-region (Figure 3.1). These districts were purposively selected based on the following criteria: i) Having functional LSBs that are producing and disseminating cassava planting materials; ii) Falling in the vulnerable regions of the country with regards to access to quality seeds (ISSD-Uganda, 2015c); iii) Having limited access to formal seed companies, with about 80% of the farmers relying on informal seed sources (DRC, 2012; ISSD-Uganda, 2015c); iv) Being hosts of refugees from the Republic of South Sudan and the Democratic Republic of Congo (ISSD-Uganda, 2015c), which had a bearing on their seed security state; and v) Being the only two districts in the West Nile Sub-region with LSBs actively involved in cassava production.

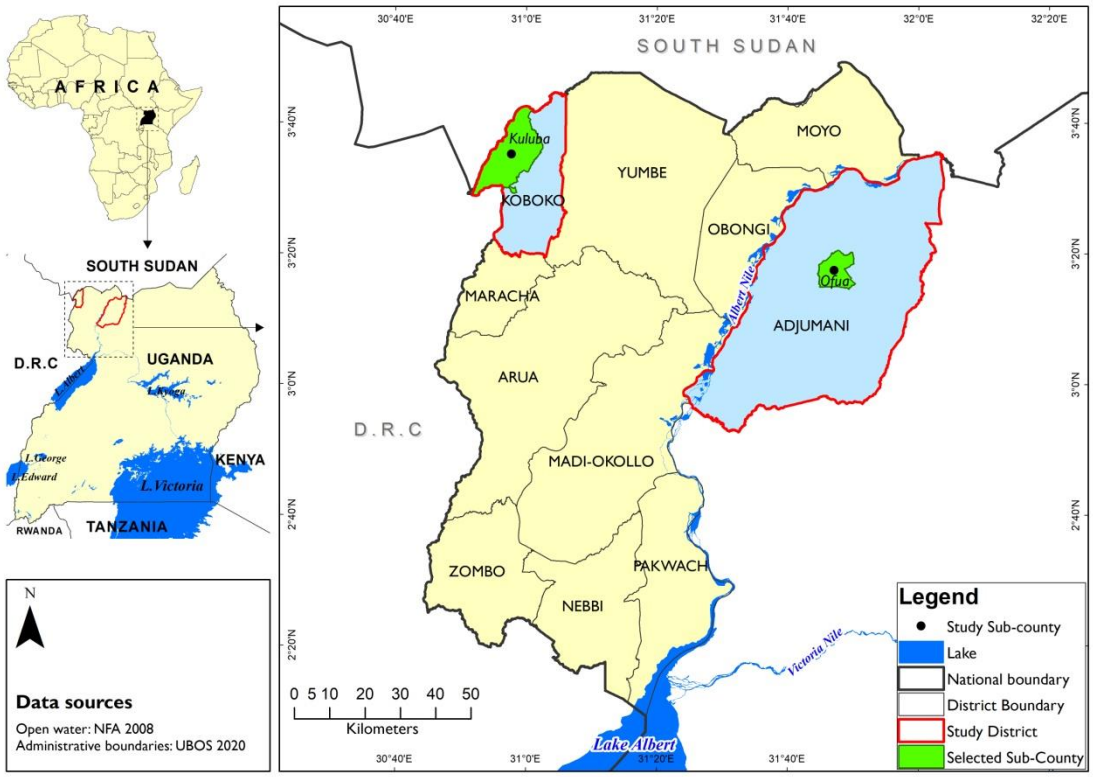

Figure 3.4: Location of Adjumani and Koboko Districts (Source: UBOS 2020)

3.1.1 Description of the study area

a) Koboko District

Koboko District is located in the north western corner of Uganda, within the West Nile sub-region. It borders South Sudan to the north and the Democratic Republic of Congo to the west. The district lies approximately between latitudes 3.40°N and 3.45°N and longitudes

30.95°E and 31.05°E (Figure 3.1). The district is uniquely positioned at a tri-border point, sharing boundaries with South Sudan to the north, Yumbe District to the east, the Democratic Republic of Congo (DRC) to the west, and Maracha District to the south. Koboko is located approximately 574 kilometres northwest of Kampala, Uganda's capital city, and lies just 3 kilometres from the DRC border and 16 kilometres from the South Sudan border. The district covers an area of 820.8 sq. km, most of which is arable. Its population is approximately 288,000 people, with 144,500 males and 143,500 females (UBOS Population Projections, 2024). Koboko has a bi-modal rainfall pattern, with an average annual rainfall of 1,250mm. Light rains occur between March and May, and the wet months are typically between August and November. During the dry season, temperatures remain high throughout. The soils covering most of the district are primarily sandy loams. Over 70% of the total district population is engaged in agriculture, mainly on a small scale. The major crops grown include cassava, beans, groundnuts, maize, and a bit of cocoa and coffee farming (Uganda Investment Authority, 2021).

b) Adjumani District

Adjumani District is located in the North-Eastern part of the West Nile sub-region, on the eastern bank of the River Nile, just before the river flows into South Sudan (Figure 3.1). The district lies approximately between latitudes 3.30°N and 3.40°N and longitudes 31.70°E and 31.80°E (Government of Uganda, 2018). It is bordered by Amuru District to the south and east, Arua and Yumbe Districts to the west, Moyo District to the north, and the Republic of South Sudan to the northeast. Adjumani covers a total land area of about 3,128 square kilometres, of which 1,455 square kilometres are arable. The district lies at an elevation ranging between 900 and 1,500 metres above sea level. Its topography and closeness to the River Nile make it favourable for both crop production and fishing. Its position near the South Sudanese border has encouraged cross-border interactions, trade, refugee settlements, and humanitarian operations that greatly influence the district's socio-economic situation.

The River Nile is the most prominent geographical feature of Adjumani District. The climate is tropical, characterised by a bimodal rainfall pattern. Annual rainfall varies between 750 mm and 1,500 mm. The rainy seasons generally occur between April and June and between August and November, with peak rainfall commonly experienced in May. The dry season stretches from December to March. In recent years, however, some parts of the district have experienced prolonged dry spells accompanied by low and erratic rainfall (Government of Uganda, 2018).

According to UBOS Population Projections (2024), the district has a population of approximately 439,400 people, with females constituting 50.4% and males 49.6%. Refugees make up a significant share of the population, accounting for about 25.1% of the total according to the UNHCR Uganda Fact Sheet (June 2023). Agriculture is the primary economic activity in Adjumani District. The majority of farmers are smallholders who grow a combination of perennial and annual crops. The perennial crops include coffee and fruits such as oranges, lemons, and mangoes, while the annual crops include maize, beans, cassava, sweet potatoes, and groundnuts (Uganda Investment Authority, 2021). Fishing along the River Nile is another major livelihood activity that complements agriculture in the district.

3.2 Research design

The study used a comparative mixed methods design is used. This design was deemed appropriate for this study because it is important in understanding the implementation process of context-specific interventions like the LSBs. The first phase of this study was a qualitative analysis of the LSBs followed by phase two which was the quantitative survey of farmer's perceptions. Perceptions are individualized and bound by time and space, which made the quantitative survey more appropriate in phase two. Particularly, within the confines of mixed-methods, objective one was pursued via qualitative approaches. The aim was to evaluate how well the LSBs implementation fitted aspects of the LSB model design. The second and third objectives were pursued using quantitative approaches. The target farmers were the members of ISSD supported LSBs in the Adjumani and Koboko districts and non-LSB member farmers in the neighbourhood of the LSBs. The members who participated in the LSBs or have been growing cassava for three consecutive years, respectively. They are assumed to possess consistent experiences and perceptions about the content being studied (Roger, 1983).

3.3 Unit of analysis

Yin (2003) reported that a vital aspect in research is the accurate identification of the unit of analysis. Babbie, (2008) defines the unit of analysis as the ‘what’ or ‘who’ is being studied. Ragin (1994) proposes that the unit of analysis is twofold: observational unit, which refers to the unit, used in data collection and analysis, and explanatory unit, which is the unit, used to generalize to the pattern of results obtained. Basing on Yin's, (2003, 2004) definition of the unit of analysis, specifically for this study two types of data were collected. First, data were collected from the local seed business and household members who subscribed to the LSBs. In addition, data were collected from non-LSB subscribing cassava farmers. In this case,

farmers were treated as holistic eco-system of the LSB thereby making the LSB the unit of analysis.

3.4 Description of study populations

The target population for this study consisted of two strata, that is, the LSB group members (participants) and the non-members (non-participants). The stratum of the non-participants had two sub-strata: 1) the non-participants (category 1) and 2) non-participants (category 2). One was considered to be in the non-participant category 1, provided he/she was not a member of a given LSB but had bought quality cassava cuttings from that LSB. Those in category 2 were both not members and had not bought quality cassava planting materials from the LSB. Farmers, who subscribed to LSB and bought cassava cuttings from them, were likely to influence the LSB processes unlike their counterparts who neither subscribed nor bought the cuttings from them. Therefore, sampling from both strata was deemed important to fully understand the factors enhancing/hindering farmers' access to quality cassava planting materials through the LSBs.

3.5 Sampling and the sample

The two LSBs were selected because these were the only available LSBs in the two districts of Koboko and Adjumani. Both were also the only LSBs in the region involved in the production and supply of quality cassava planting materials.

a) Kuluba Farmers Association (KFA); started in 2009 as a mixed farmers group. It was part of a bigger group originally referred to as Marukulu Farmers Association, located in Kagoropa village, Kuluba Sub-County, Koboko district. KFA was started as a savings group by the farmers of Marukulu in 2013. This group was picked up by NAADS for integration into farming for livelihood. KFA was enrolled as an ISSD seed multiplication group in 2013. It started with 30 members (27 were male and 18 female members), a number that had reached 45 by 2017. Support for KFA was aimed at multiplication of cassava, beans, groundnuts and simsim.

b) Andevuka Mixed Farmers Association (AMIFA); operated in Kureku east village in Ofuda Sub-County, Adjumani district. The group was formed on the 03/02/2002 as a church association. The farming component of the association was aimed at improving livelihoods. The group was initially an all-women's group under the names of PITIPITI women. As the group gained access to support from NAADS programme in 2007, its membership was opened to men. On joining NAADS the group kicked off by establishing a 10 acre rice field.

In 2009, the Alliance for Green Revolution Africa (AGRA) picked AMIFA up, as a farmer-based rice seed multiplier until 2012. In 2013 ISSD, through its goal of empowering farmers for market production, adopted AMIFA and transformed it into a local seed business. As an LSB, AMIFA's start-up members were 30, (13 males and 17 female), a number that has since expanded to 41. AMIFA LSB aimed at the multiplication of cassava, bean, and rice 'seed'

3.5.1 Sampling

Three samples were obtained in this study, (Table 3.1). To obtain the LSB situated participants, the list of member farmers for KFA and AMIFA were all sampled for the study, but it was later found that some did not meet the criteria and they were thus left out from the LSBs' register of members. The names were evaluated based on members' three-year history of participating in cassava seed multiplication. Particularly, eligible members were those members who: i) had a plot allocated to seed production for three previous years; ii) participated in LSB meetings regularly and iii) had for the previous three years been multiplying cassava seeds. The outcome indicated that out of the 42 registered members for KFA only 31 met the criteria. For AMIFA only 30 members of 41 enrolled members merited the criterion of having been active for three years in cassava 'seed' production. Given the number of members for each LSB was below 50, all members who fulfilled the enrolment criterion were considered for this study.

Table 3.1: Study participant selection technique

Sampling level	Sampling frame	Selected	Selection method
LSB members			
LSB members (KFA)	42	31	Census
LSB members (AMIFA)	41	30	Census
Total (LSB)	83	61	
LSB non-members but 'seed' buyers			
LSB Non-members, buyer (KFA)	40	40	Snowball
LSB Non-members, buyer (AMIFA)	42	42	Snowball
LSB non-members, non 'seed' buyers			
LSB non-members, non-buyers (KFA)		41	Snowball
LSB non-members, non-buyers (AMIFA)		42	
Total sample (non - members)		165	

Source: Generated by researcher from district level data.

For participants who bought cassava planting material from the LSBs but were not registered members and those who neither bought nor were members, were sampled using snowballing.

Snowball was thought to be an appropriate sampling strategy, given that the full sampling frame for the non-members who were non-buyers and those who were buyers of the cassava cuttings could not be established, due to lack of information. It was also necessary to eliminate the possibility of accessing farmers who did not buy cassava 'seed'. Farmers are known of claiming falsely of being involved in an intervention expecting to obtain freely distributable supplies, in case any were to be given to farmers who would have implemented the externally sponsored interventions (Ndaula *et al.,* 2021).

To implement the snowball sampling strategy, the coordinator at each LSB was asked to identify five (5) farmers who were known to be both non-members but buyers of cassava planting materials and five (5) farmers who were non-members and non-buyers, in the area served by the LSB but planting cassava. The 5-member list for each category was used to randomly select the first snowball respondent, who later identified the next, and so on. The procedure was continued until the final desired sample had been obtained. The maximum sample size was set in the range of 40 participants, pre-determined by the number that was enrolled at the LSB were sampling was first done (that is, KFA). The goal was to obtain a final sample that consisted of comparable number of participants under each category for each LSB. Thus, at the end, 40 buyers and 41 non-buyers, and 41 buyers and 42 non-buyers had been enrolled for KFA and AMIFA, respectively. The decision to select a sample of comparable size was based on the work of Joseph *et al.,* (2015), Teddlie, and Yu, (2007). These two scholars suggest that precise judgments can be reached when comparing categories of data on the same parameter, only if the sample sizes of the groups being compared are not so distinct.

Non-LSB members were included to provide a comprehensive assessment of access to cassava planting materials within LSB operational areas. This group comprised farmers who either purchased cassava cuttings from LSBs without formal membership or had no engagement with the LSBs at all. The inclusion of non-LSB members facilitated a comparative analysis between users and non-users, thereby highlighting key determinants of access such as the availability of planting materials, the effectiveness of information dissemination, and the perceived reliability of seed sources. Moreover, it enabled an assessment of the LSBs' outreach beyond their immediate membership base, thereby strengthening the validity and representativeness of the study findings. Given the absence of a formal sampling frame for non-members, snowball sampling was employed to reach genuine respondents and avoid inclusion bias.

3.6 Data collection tools and data collection process

Data was collected using semi-structured interviews, focus group discussions, key informant interviews, and review of secondary data/documents. Details on the information collected and data collection process using each tool included in the subsequent subsections a-e.

a) Semi-structured interviews: The semi-structured interviews were conducted using a questionnaire (Annex 1) and generated information on respondents' characteristics-socio-demographics attributes, and perceptions on access to support services and seed access dimensions through the use of a liker scale. Two trained interviewers and the researcher administered the questionnaires. The training of the interviewers took two days in a central place to minimize interpreter errors from asking and recording variations during data collection. Trained interviewers were used because the farmers in the study area had high illiteracy rates.

The interviews were conducted in Kakwa language in Koboko and Madi language in Adjumani, with responses translated and recorded in English on a pre-coded scheduleThe average interview time was 45 minutes. 165 people were interviewed, although 22 responses could not be used because they were incomplete. The final status, showed the total obtained data to have originated from one hundred forty-three (143) participants out of the sampled 165 farmers, representing 87% response rate. Response rate is the ratio of the number of returned but answered questionnaires to sampled respondents. This response rate was considered very good, given that in social research response rate of 50% or higher is considered adequate, 60% or higher is good, and that of 70% and higher is very good (Basheka, 2009).

b) Focus group discussions: Two Focus Group Discussions (FGDs) were conducted for each group. Each FGD had 12 participants. At least half of the participants in each FGD were female, which was intended to have an inclusive discussion that could ensure that both men and women could contribute and reflect equally on the issues concerning access to cassava planting materials. To ensure comparability of information across FGDs, all the discussions were done following a pre-designed guide (see Annex 2) by a researcher. Two note-takers were present to support the process of capturing the proceedings of the discussion. Each FGD was preceded by a welcome note, an overview of the topic, and governing rules to be followed.

The discussions addressed the general questions first, followed by probing phases, where participants would explain further issues related to their earlier responses about the. The FGDs generated information on the history of LSB, the implementation status of the model with regards to governance, seed production, quality assurance mechanisms, marketing strategies and the reasons behind the use and or non-use of quality 'seed' provided by the LSBs. At each closure, a summary would be offered and the participants asked whether their responses covered the purpose of the discussion or they would like to add some more related information. Each FGD session took an average of one hour and 30 minutes to completion.

c) Key informant interviews: Key informant interviews were held with the chairpersons of AMIFA and KFA, the DAOs and Extension workers, the LSB seed and LSB agribusiness experts based at ABIIZARDI, NARO and ISSD personnel respectively. The key informants provided information on farmers' access to support services such as extension and credit facilities, the effect of the LSBs in ensuring the seed access dimensions for cassava planting materials. The information generated from the key informants was used for validating information given by farmers.

d) Review of secondary data sources: This involved a review of LSB project documents, AMIFA and KFA group documents (group constitution, business plans, and minutes of meetings) and findings of earlier scholarly contributions about Local Seed Business and Cassava crop. Journal articles, ISSD-LSB project briefs, LSB operational reports and strategic documents. These documents were obtained from Makerere University Library, Research4Life digital library, Google scholar and from the ISSD-Uganda website.

e) Participant observation: This involved physical visits to the LSBs farms and marketing centres. The aim was to ascertain and validate the issues raised by LSB group members in part 3.4 (b and d).

3.7 Ethical considerations

The proposal and research protocol leading to this dissertation went through all the required approvals of the Department of Extension and Innovation Studies, School of Agricultural Sciences, Makerere University. Before accessing the study sites, necessary approvals were acquired from the administrators of the two LSBs. Each interview session was preceded by participant debriefing about the purpose of the study. Each participant was then asked to endorse the contents of the written debrief, if they were willing to participate in the study. In

all post data collection processes, names of respondents were replaced with numerical identifiers to hide the identity of respondents. FGD information was attributed to the groups.

3.8 Data analysis

3.8.1 Qualitative data analysis

Objective 1: The qualitative data for Objective 1, concerning the implementation process of the LSB model, underwent a rigorous, multi-stage thematic content analysis. the four-pillar model of a well-performing Local Seed Business as articulated by ISSD-Uganda (2015c) and related program guidelines. This framework, comprising the pillars of Technical Equipment, Professional Organization, Market Orientation, and Strategic Linkages each with specific, documented indicators—served as the definitive benchmark. It was operationalized into a detailed codebook prior to analysis, ensuring a consistent and structured evaluation of the field data against an established ideal.

All transcripts from Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs), alongside reviewed documents (constitutions, minutes, reports), were thoroughly read and re-read. Data was then deductively coded line-by-line using the framework's codes (e.g., "Tech_SeedSourcing," "Org_CommitteeFunction," "Market_ChannelDiversity"). This initial pass tagged every piece of evidence relevant to the model's components. Concurrently, an inductive approach captured emergent, context-specific themes not fully anticipated by the framework, such as "historical_donor_dependency" or "challenge_seasonal_labour," which provided crucial nuance. For each LSB (AMIFA and KFA), coded data was organized into comprehensive analytical matrices. These matrices placed the pillars and their ideal indicators on one axis and the compiled empirical evidence—direct quotes, observed practices, and documented records—on the other. This visual tool enabled a precise **gap analysis**, clearly mapping where practices aligned with, partially met, or significantly deviated from the model's standards. The analysis then compared the two LSBs side-by-side across each pillar to identify patterns of variation in implementation success.

Findings from FGDs (reflecting member perceptions) were constantly contrasted with KIIs (from leaders and officials) and hard documentary evidence. Discrepancies, such as conflicts between claimed training frequencies and actual records, were interrogated to establish the most reliable narrative. Finally, the analysis explicitly linked implementation status to functional outcomes, connecting identified weaknesses (e.g., a non-functional marketing committee) directly to their implications for seed access (e.g., poor customer awareness and low sales). This detailed, structured approach transformed raw qualitative data into a coherent,

evidence-based explanation of *how* the design of the LSB model was translated or failed to be translated into effective practice in Adjumani and Koboko districts.

3.8.2 Quantitative data analysis

Quantitative data were used in objective 2 and 3. This type of data was organized, edited, and coded before being analysed using SPSS version 16.

Objective 2: The analysis employed descriptive statistical techniques, which were deemed appropriate since the objective focused on assessing farmers' perceptions of the LSB model as a pathway for accessing quality cassava planting materials. Variables such as farmers' satisfaction levels, access to cassava cuttings, use of support services, and overall opinions on LSB effectiveness were analyzed. These variables were summarized using frequencies, percentages, and cross-tabulations to generate clear insights. This approach has been widely applied in related perception studies (e.g., Adong & Mwaura, 2019; Mulatu & Mekonnen, 2020) and has proven effective in examining farmers' attitudes and experiences in seed system interventions.

Objective 3: The analysis involved the use binary logistic regression, which was was deemed ideal because the dependent variable was dichotomous (having two levels of farmers; those buying quality cassava cuttings from the LSBs and those who were not buying quality cassava cuttings from the LSB). The independent variables (age, sex, education level, access to training, land holding, access to credit, proximity to the seed source, extension service, income of the farmer, participation in social networks, perceptions towards improved varieties, availability of labour, perceptions on price and replacement, seed availability and quality), involved both continuous or categorical scales. Specifically, the logit model as described by Gujarati (1995) was used for analysis. This model has been applied in similar studies and was found to be effective in explaining such variables of dichotomous nature.

In determining the explanatory variables for access of cassava cuttings, the Maximum Likelihood Estimation Method was used. This involved entering the first 21 variables in the model and then applying the statistical rule of "removing the most insignificant variables and re-run the model until stable predictors are determined. To determine the effect and the magnitude of the predictor, the Beta values and the associated signs were used. A negative sign represented an inhibitor whereas a positive sign reflected an enhancer (Moussa *et al.*, 2009). The odds ratio coefficients for individual variables that were greater than 1 indicated a very high likelihood of farmers accessing quality cassava cuttings through the LSB as the

status of the predictors was adjusted whereas those less than 1 were interpreted to mean low responsiveness.

3.8.3 Modelling specification (the binary logistic regression equation)

A linear logistic regression model was developed with two possible outcomes 0 or 1 regarding farmers' access to quality cassava cuttings. In formulating the model, Pi was assumed the observed response of farmer i.e. (Pi =1 for "accessing planting materials", otherwise "not accessing planting materials" Pi =0 or 1-Pi). Access to quality cassava cuttings by an i^{ts} farmer depended on X_i, which is a vector of factors representing farmer-specific contexts and perceptions regarding the LSB. X_i included age (X_A), sex (X_G), education level (X_E), satisfaction (X_O), access to training (X_T), land holding (X_{LH}), access to credit (X_C), distance (X_D), extension service (X_E), level of income (X_I), participation in social networks (X_S), perceptions towards improved farming (X_{AT}), availability of labor (x_{al}) and farmers' perception on: price of the seed (X_{PR}), replacement (X_{SR}), seed availability (X_{SA}) and seed quality (X_{SQ}), all mostly entered in the model as dummies. Conceptually, the model was stated as follows; where p represents the probability of farmers' accessβ_0 is a constant, X_{ij} is the i^t observation of the j^{th} explanatory variable. The error term was represented by (ε) and assumed to have a mean equal to zero.

$$\log\left[\frac{P_i}{1-P_i}\right] = \beta_0 + \sum_{j=i}^{n} \beta_j X_{ji} + \varepsilon \qquad \text{(Equation 1)}$$

The empirical model specifying the access to quality planting materials is implicitly stated in equation 2. The dependent variable is represented by the natural log of the probability to access seed P_i by a farmer or the probability of not accessing seed $(1 - P_i)$. The error term is assumed to be independently distributed over the sample and accounts for the unobservable variables and characteristics of the surveyed households.

$$\log\left[\frac{P_i}{1-P_i}\right] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \cdots + .. \beta_p X_p + \varepsilon \qquad \text{(Equation 2)}$$

The regression equation for the independent variables was therefore written as:

$$\log\left[\frac{P_i}{1-P_i}\right] = \beta_0 + \beta_1 X_A + \beta_2 X_G + \beta_3 X_M + \beta_4 X_E + \beta_5 X_P + \beta_6 X_C + \beta_7 X_D + \beta_8 X_T + \beta_9 X_E + \beta_{10} X_I + \beta_{11} X_{MI} + \beta_{12} X_S + \beta_{13} X_{AT} + \beta_{14} X_L + \beta_{15} X_{PD} + \varepsilon$$

(Equation 3)

3.8.4 Test of multicollinearity

Before running the regression model, the independent variables were tested for multicollinearity. Multicollinearity is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the other with a substantial degree of accuracy (Jeeshim and Kucc, 2003). Multicollinearity was estimated using the Variance Inflation Factor (VIF), to rule out possibilities of inflated or deflated results due to effects independent variables could have on each other. As a rule of thumb, when the VIF exceeds 10, there should be cause for concern for multicollinearity. If the values of the VIF for the continuous variables are less than 10, would indicate absence of multicollinearity.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.1 Socio-demographic characteristics of respondents

About 75% non-LSB members who accessed quality cassava cuttings in Adjumani were male, while in Koboko men constituted 87% of non-members who accessed the seed.

Table 4.1: Socio-demographic characteristics of the respondents in Adjumani and Koboko Districts (N=143)

Variables	Adjumani			Koboko		
	AMIFA (n=72)			KFA (n=71)		
	LSB member	Non-member but Buyer	Non-member, non-Buyer	LSB Member	Non-member, but Buyer	Non-member non-Buyer
Age (Years):						
• 20-50	85	81	86	75	75	86
• Above 50	15	19	14	25	25	14
• Average age	43	42	36	44	44	39
Sex:						
• Male	88	75	81	75	87	86
• Female	22	25	19	25	13	14
Educational level:						
• None	2	25	10	10	38	10
• Primary	46	13	52	47	25	57
• Secondary	37	37	19	43	37	24
• Tertiary	15	25	19	0	0	9
Marital status:						
• Never married	7	6	10	2	13	10
• Married	85	88	86	90	74	90
• Widow/widower	8	6	4	8	13	0
• Separated						
Sources of income:						
• Livestock	4	6	0	0	2	5
• Crop	93	94	100	100	96	90
• Others	3	0	0	0	2	5
Land size (acres):						
• <1	0	0	19	0	12	10
• 1-5	65	50	62	43	25	43
• >5	35	50	19	57	63	47
• Average	16	6	3	7	6	1
Cassava farming experience:						
• <Three years	0	0	0	2	0	0
• =Three years	46	0	0	55	0	0
• >three Years	54	100	0	43	100	0

Notes: The numbers in the rows represent % response.

The age distribution of respondents in Adjumani and Koboko shows that the overwhelming majority of farmers engaged in cassava production fall within the productive age bracket of 20–50 years**,** while very few are above 50 years. The calculated average ages highlight this trend: in Adjumani, the mean ages were 43 years for LSB members**,** 42 years for non-members who were buyers, and 36 years for non-members and non-buyers. In Koboko, the averages were 44 years across both LSB members and non-member buyers**,** while non-member non-buyers averaged 39 years. This pattern suggests that cassava cultivation and participation in seed business activities are largely driven by middle-aged adults who are still in their prime farming years, with relatively limited involvement from very young or much older farmers **(**Table 4.1**).**

The gender distribution of respondents in Adjumani and Koboko indicates that men constituted the majority across all categories, while women were comparatively fewer. In Adjumani, males represented 88% of LSB members**,** 75% of non-member buyers**,** and 81% of non-member non-buyers**.** A similar pattern was observed in Koboko, where males accounted for 75% of LSB members**,** 87% of non-member buyers, and 86% of non-member non-buyers**.** These findings demonstrate that cassava cultivation and engagement in seed-related activities are predominantly male-driven, highlighting men's central role in production, marketing, and local seed system dynamics in both districts (Table 4.1).

The education levels of respondents in Adjumani and Koboko, as shown in Table 4.1, indicate that most farmers had primary and secondary education, with few reaching tertiary and a small proportion having no formal schooling. In Adjumani, LSB members were mainly at primary (46%) and secondary (37%), while non-member buyers had more at secondary (37%) and tertiary (25%). Non-member non-buyers were dominated by primary (52%). In Koboko, LSB members had more at secondary (43%) and primary (47%), while non-member buyers were split between primary (38%) and secondary (37%). Non-member non-buyers had 57% at primary and smaller shares at secondary (24%) and tertiary (9%). Overall, cassava farmers and seed users are concentrated at primary and secondary education levels (Table 4.1).

The marital status of respondents in Adjumani and Koboko, as presented in Table 4.1, shows that the majority were married, with smaller proportions never married, widowed, or separated. In Adjumani, 85% of LSB members, 88% of non-member buyers, and 86% of non-member non-buyers were married, while the rest were distributed among never married (7–10%), widowed (4–8%), and separated (1%). In Koboko, marriage also dominated with 90% of LSB members and 90% of non-member non-buyers, while non-member buyers had 74%

married, 13% never married, and 13% widowed. These results indicate that cassava farming and seed business activities are largely undertaken by married individuals (Table 4.1).

The cassava farming experience of respondents in Adjumani and Koboko, as shown in Table 4.1, indicates that most LSB members had more than three years of experience. In Adjumani, 54% of LSB members reported more than three years, while in Koboko, 43% had more than three years and 55% reported exactly three years. This reflects the sustained engagement of farmers in cassava cultivation and their strong experience in seed business activities.

The main sources of household income in Adjumani and Koboko were predominantly crop farming, with livestock and other sources contributing minimally. In Adjumani, 93% of LSB members, 94% of non-member buyers, and 100% of non-member non-buyers depended on crops, while only 4–6% reported livestock and very few indicated other sources. In Koboko, crop farming was also dominant, accounting for 100% among LSB members, 96% of non-member buyers, and 90% of non-member non-buyers, with livestock and others making up small shares. This highlights the centrality of crop production as the primary livelihood activity for households engaged in cassava farming and seed systems (Table 4.1).

4.2 Implementation process of the local seed business model in enhancing access to quality seed in Adjumani and Koboko Districts.

The performance of AMIFA and KFA LSBs was evaluated against the four core pillars of a well-functioning LSB and these are technical equipment, professional organization, market orientation, and strategic linkages as outlined in the ISSD-Uganda model. Technical capacity was constrained in both LSBs by irregular quality control and inspection procedures, limited extension support, and inadequate post-harvest handling. While both accessed foundation seed from research institutions, inspections by the District Agricultural Officer were inconsistent, and processing facilities were basic. Laboratory testing at Ngetta or Kawanda, a critical step in the ideal model, was not routine. As a result, farmers in some focus group discussions (FGDs) reported occasional late delivery and uncertainty about seed quality.

Professional organization weaknesses were pronounced. Governance structures were in place on paper, executive committees and sub-committees existed but meetings were irregular (in some cases only once in two years), agendas were unstructured, and financial documentation was incomplete. Both LSBs lacked updated budgets and income tracking systems, limiting their ability to plan or mobilize resources effectively. AMIFA members highlighted gaps in

financial management and record keeping, while KFA noted the absence of structured farmer training in agribusiness skills.

Market orientation was only partially achieved. AMIFA demonstrated stronger market alignment, tailoring seed production to farmer demand and engaging in some promotional activities, while KFA's outreach was more passive. Neither LSB consistently conducted formal market research. The dissemination strategies were largely reactive, selling when planting season approached rather than following a proactive marketing plan. Farmers in Koboko appreciated proximity to KFA's site but expressed frustration over late or insufficient quantities of cassava cuttings.

Strategic linkages existed but were underdeveloped. Both LSBs had ties to research institutes and extension services but lacked strong connections to credit providers, agro-input dealers, and formal markets. Partnerships were often donor-driven and project-bound, with limited sustainability planning. KFA for instance reported difficulties mobilizing resources to scale operations, while AMIFA's collaboration with extension workers was irregular. Contrasting with the ideal LSB model, as described in ISSD-Uganda guidelines, thus a performance gap.

a) Technically equipped LSBs in the ideal model follow strict, quality control procedures, have functional processing equipment, maintain adequate storage, and ensure timely laboratory certification standards not consistently met by AMIFA or KFA.
b) Professionally organized LSBs operate with clear governance, functional committees, regular meetings, robust financial systems, and effective resource mobilization, whereas the studied LSBs struggled with irregular operations and poor record keeping.
c) Market-oriented LSBs should develop and implement a business plan, conduct regular market research, diversify distribution channels, and maintain customer feedback systems; here, marketing was sporadic and mostly seasonal.
d) Strategically linked LSBs cultivate durable partnerships for inputs, services, credit, and market access; in practice, AMIFA and KFA's linkages were narrow and largely dependent on external projects.

Despite these limitations, survey results showed that LSB access stood at 56% in Adjumani and 53% in Koboko, with land ownership high in both districts (87% and 83% respectively) and average cultivated land of 3.2 and 2.9 acres. FGDs emphasized the importance of improving coordination, timeliness, and inclusivity, especially for farmers in remote areas. Farmers' quotes such as "*Access is better these days, but many still travel far to find clean*

planting material" (Dzaipi) and "*If LSB groups organized better and informed us early, we would prepare to buy their cassava cuttings"* (Ludara) reinforce the need for governance, planning, and communication reforms. While AMIFA and KFA have demonstrated that the LSB model can bridge seed access gaps, they operate below the ideal LSB standard.

Table 4.2: Summary of KII and FGD responses from farmers on professional organisation

District	Location/ Institution	Activity Type	Participants/ Respondents	Key Issues
Adjumani	Ayiri Parish	Focus Group Discussion	12 cassava farmers (8Female, 4Male)	Limited market access, irregular inspection, seed scarcity, lack of group planning
	AMIFA LSB	Key Informant Interview	Chairperson and Field Officer	Weak business governance, low record keeping capacity, poor linkage with district offices
Koboko	Keri Parish	Focus Group Discussion	10 cassava producers (5Female, 5Male)	Proximity and timely access cited, but quality and volume inconsistent
	KFA LSB	Key Informant Interview	Manager and Technical Advisor	Low financial literacy, insufficient farmer training, dependence on local leaders

The findings reveal that the implementation process of the Local Seed Business (LSB) model in Adjumani and Koboko districts has moderately enhanced access to quality cassava seed but remains constrained by structural and institutional challenges (Table 4.2). In Adjumani, both household survey data and FGD responses indicate that farmers had access to quality cassava cuttings and appreciated the proximity and timeliness of supply. However, issues such as limited market access, irregular inspection, seed scarcity, and lack of group planning were consistently raised. These points to weaknesses in planning and coordination despite the availability of seed

Key Informant Interviews (KIIs) with AMIFA (Table 4.2) officials further highlighted operational gaps, including weak business governance, poor record-keeping and inadequate linkages with district offices undermining the model's effectiveness. In Koboko, while farmers acknowledged timely seed availability during FGDs, concerns about inconsistent quality and volume were prevalent. This was supported by KIIs with KFA leadership, who cited low financial literacy, limited farmer training, and over-reliance on local leaders as key barriers to effective implementation.

Table 4.3: Quantity and price distribution in the LSBs (n = 45), KFA (n = 41) in Adjumani and Koboko districts

Variable	Implementation of LSBs in Practice	
	AMIFA (Adjumani)	**KFA (Koboko)**
Quantity of cassava cuttings	1000 bags of cuttings	30 bags of cuttings
	60 individual farmers	45 individual farmers
	5 bulk buyers on behalf of farmers (NGOs)	No record of bulk buyers
Price per bag (UGX)	10,000-15,000 (for farmers) 30,000 (NGOs)	15,000 (for farmers) 20,000 (NGOs)

Note: a bag of cassava planting materials contains 500 cuttings planting 12.5% of an acre.

The findings reveal that the implementation of the Local Seed Business (LSB) model has resulted in varied performance among seed businesses in Adjumani and Koboko districts (Table 4.3). Specifically, AMIFA effectively increased access to quality seeds, as evidenced by higher volumes marketed (1,000 bags), broader client access including NGOs, and flexible pricing strategies. In contrast, KFA marketed significantly fewer seeds (30 bags), with limited outreach and fixed pricing, indicating challenges in market linkage and scalability.

4.2.1 Technical equipment

Access to quality cassava planting materials through Local Seed Businesses (LSBs) depends on their technical capacity to meet quality standards. The study revealed sharp contrasts between AMIFA and KFA. AMIFA received 19 training and extension sessions from partners such as NARO, the District Agricultural Officer (DAO), Sub-County staff, and NGOs, strengthening their skills in agronomy, quality control, post-harvest handling, and record keeping. KFA, however, received only three sessions, limiting capacity building and institutional growth. Key informants noted that AMIFA's wide partnerships provided consistent support, while in KFA, demands for facilitation by local extension workers discouraged farmers from seeking advice, weakening technical performance. AMIFA's formal agreement with the DAO required them to cover regulatory costs inspection fees, seed testing, and labeling. Through strong partnerships, AMIFA met these obligations, ensuring certification. In contrast, KFA often defaulted due to financial constraints, undermining their ability to produce quality-declared seed.

Table 4.4: Progress in Implementation and Performance of LSBs in Adjumani (AMIFA) and Koboko (KFA) Districts

ISSD INDICATOR	Progress in implementation of LSBs under study in Adjumani and Koboko districts	
	LSB PERFORMANCE	
	AMIFA (n = 30)	KFA (n = 31)
Number of extension and training services accessed	12 trainings per year from Sub-County extension providers, 2 per year from NARO staff, 2 times per year from the district and 3 times per year from PLADIM, a local NGO that connected product buyers to the LSB	One contact session from Sub-County extension providers, NARO staff and ZOA an international NGO
Functional quality assurance mechanisms	ABIZARDI conducted the mandatory quality control trainings for the production, marketing and quality control committee (quarterly) Two inspections required one for seasons 1 and 2 done by the DAO and seasonal returns files as required	ABIZARDI conducted the mandatory quarterly quality control trainings for the production, marketing and quality control committee Reported expensive external quality control inspections Did not file returns to DAO and DAO did not conduct the required 2 inspections/ year

The findings revealed significant differences in technical progress between AMIFA and KFA LSBs. In Adjumani, AMIFA accessed regular extension services, including 12 trainings per year from the sub-county, 2 from NARO, 2 from the district, and 3 from PLADIM, which also facilitated market linkages. It further received quarterly quality control training from ABIZARDI, filed seasonal returns, and underwent biannual inspections by the DAO. By contrast, KFA in Koboko had only one joint session with sub-county staff, NARO, and ZOA. Although ABIZARDI delivered the required quality trainings, KFA neither filed returns nor complied with the expected biannual inspections (Table 4.4).

b) Quality control in production of quality cassava planting materials: The study established that quality assurance in Local Seed Businesses (LSBs) operated at two levels: Internal Quality Control Committees (IQCCs) and External Quality Control Committees (EQCCs). IQCCs, composed of trained LSB members, conducted routine checks within the groups, while EQCCs acted as independent auditors through the National Seed Institute (NSI) or technical staff delegated by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). Together, these structures were intended to ensure adherence to seed quality standards from production to marketing.

In both AMIFA and KFA, Internal Quality Control Committees (IQCCs) were formally constituted and trained by the National Agricultural Research Organization (NARO) in seed quality assurance. These committees were tasked with monitoring the production cycle, including isolation distances, pest and disease control, harvesting, and post-harvest handling. However, their functionality and effectiveness varied significantly. In Koboko, KFA's IQCC was initially active during the project period but weakened once donor-funded supervision ended. Key informant interviews indicated that the External Quality Control Committee (EQCC), which was meant to oversee the IQCC, operated irregularly due to the high cost of its services after the Integrated Seed Sector Development (ISSD) project stopped covering expenses. As a result, certification procedures were often delayed or abandoned. Farmers were discouraged by inspection, testing, and labeling costs, leading to reduced or skipped inspections, limited submission of planting returns to the District Agricultural Officer (DAO), and no new certified seed batches after ISSD's exit.

By contrast, AMIFA in Adjumani maintained a more consistent quality control system. IQCC members regularly filed production returns to the DAO, while inspections were conducted each season by both the DAO and Abi-ZARDI. The proximity of these partners ensured timely supervision, adherence to quality standards, and completion of certification procedures. EQCC engagement was also more frequent, enabling AMIFA to maintain compliance and supply certified cassava cuttings to a larger farmer base. Compared with the ideal ISSD-Uganda model where IQCCs file returns, conduct routine inspections, and ensure compliance, while EQCCs or MAAIF-certified inspectors conduct at least two external inspections per season, sample seed for testing, and issue certification labels AMIFA's practices were more closely aligned. KFA fell short due to weak monitoring, financial constraints, and collapse of certification processes after donor support ended.

Overall, the findings highlight that sustainable quality assurance in LSBs requires more than formal structures. Proximity to technical partners, reliable finances for certification and strong governance are critical. These factors gave AMIFA a clear advantage over KFA, enabling it to deliver higher-quality cassava planting materials and sustain farmer confidence in its seed system.

4.2.2 Professional organization

The professional organization of an LSB reflects how well it is structured, governed, and managed to deliver on its mandate of producing and marketing quality seed.

Table 4.5: Governance and Resource Management of LSBs in Adjumani (AMIFA) and Koboko (KFA) Districts

Criterion	**Progress of LSBs in the case study in Adjumani and Koboko districts**	
	AMIFA	KFA
Governance: • number of functional committees	Executive committee, production, marketing, disciplinary and quality control committees in place and operational as stipulated in their constitution	Executive (finance and audits), production, marketing and quality control committees in place and operational, as stipulated in their constitution
Efficient resource management: • Resource mobilization • Financial monitoring • Record management	Membership fees of UGx 5,000/=, annual 10,000 access to money through saving scheme, commission on sales of outputs from members and ISSD	Membership fees of UGx10,000/=, access to money through saving scheme, commission on sales of outputs from members and ISSD

It encompasses governance arrangements, financial management systems, resource mobilization, meeting regularity, and the functionality of sub-committees responsible for production, quality control, marketing, and finance. In a well-performing LSB, these elements operate seamlessly, with decisions guided by documented plans, regular review of progress, and clear accountability mechanisms.

The findings show that both AMIFA and KFA have made tangible progress in establishing professional organizational structures that align with the Local Seed Business (LSB) model. This progress is evident in the formal constitution and operationalization of governance systems, the creation of functional committees, and the establishment of financial management and accountability mechanisms. As reflected in Table 4.5, governance mechanisms are in place and operational in both cases, providing a solid institutional framework for their activities. AMIFA has five fully functional committees which are executive, production, marketing, disciplinary, and quality control each performing specific roles as stipulated in its constitution. Similarly, KFA has established structured and active executive (finance and audit), production, marketing, and quality control committees. The presence of these committees in both LSBs signifies a level of institutional maturity, ensuring

that leadership is organized, responsibilities are clearly defined, and oversight functions are embedded in day-to-day operations.

In practice, these structures have enabled both LSBs to coordinate activities more efficiently, monitor production processes, and address operational challenges through defined decision-making channels. For example, in AMIFA, the marketing committee works closely with the production committee to align seed output with seasonal demand, while the disciplinary committee addresses member compliance issues. In KFA, the finance and audit committee actively reviews financial records, and the quality control committee works with the production team to ensure standards are met, although, as noted in other sections, consistency in implementation varies.

Resource mobilization and financial management also reflect a structured approach in both LSBs. AMIFA raises funds through member contributions UGX 5,000 as a joining fee and UGX 10,000 annually supplemented by sales commissions, support from the Integrated Seed Sector Development (ISSD) programme, and access to savings schemes. KFA operates under a similar model but with a slightly higher joining fee of UGX 10,000, alongside comparable income sources and financial accountability mechanisms. Both groups have instituted financial monitoring practices that promote transparency, build member confidence, and enhance their ability to meet operational expenses such as inspection fees, seed testing, and labeling costs.

a) Governance: Each LSB had a constitution containing the laws that guided governance issues. The LSB constitution defined the duties and responsibilities of the executives and ordinary members, how often an assembly would be called, subscription fees, asset management and how to dissolve the group in case there was need. Inconsistencies were observed regarding adherence with constitutionally defined intervals of holding meetings. For both LSBs, meetings were reported to seat less often (once in the last 2 years) than the gazette intervals, which was supposed to be at least twice every year. The executive committees were also supposed to seat at least every two months.

b) Membership: Admission into an LSB was by application, which was assessed and approved by the general assembly. Membership was open to any willing person 18 years of age or above, male or female whose main occupation was farming undertaken in Adjumani and Koboko districts for AMIFA and KFA, respectively.

c) The administrative structure of the LSB: The administrative structure of the LSBs comprised of the general assembly, executive committee and sub-committees which were meant to be 3 in number. The sub committees that were found in place for both LSBs included: Production; Seed quality control; Finance and Resource mobilization, Marketing, Sales and customer care. These committees were established by members during the AGM. Each committee comprised of 5 members who served a term of two years, renewable for two terms only. Though the LSBs had all those committees in place, as stipulated by the ISSD guidelines (ISSD, 2016), some were redundant. The most active committees were the production and finance committees and these had up to date minutes of the preceding of their sittings of at least once every 2 months. During a focus group discussion with members of KFA, participants expressed frustration over internal communication gaps, stating, 'The production committee and the financial committee make themselves the most relevant and never give updates to other committees so that they can do their job.' This highlights internal governance challenges within the LSB, where limited inter-committee coordination may hinder effective planning and implementation.

d) Resource mobilization: LSB had internal and external sources of funding: Internal financing included funds from membership fees, share capital, commissions on sold products of members through the LSB and annual subscription. AMIFA charged a membership fee of UGX 5,000 and annual subscription s of 10,000/= whereas membership for KFA was UGX 10,000. For the case of KFA, upon admission, a member was required to pay membership fees and a known number of shares would be allotted to the new member. None of the members of KFA was required to pay annual subscription fee. The membership fees were non-refundable if one decided to leave the group, but the shares were refundable. For AMIFA, the annual subscription served as the shares one held. Another source of finance for was the 20% commission from group crop sales; for the case of AMIFA it was recently adjusted to 2%. The strategy used was to loan 'seed to the farmers, which they could pay in kind via marketing their produce through the LSB. The cost of seed and the commission would be deducted before paying the farmer their net-pay for the products. The LSBs could also access credit in form of loans from their internal voluntary savings ("Seed Box"), redeeming them from the collateral demands by commercial banks.

However, LSBs also had external sources of finance included loans, grants and donations. The LSBs also received grants from development partners, NGOs and NARO through ABIZARDI in Adjumani and Koboko districts. Most grants would come in the 1st year of

establishment of the LSBs and were mainly: Subsidies in form of foundation seed, provision of training and orientation of LSB members, financial support for extension services and for DAOs during site inspections and the seed certification processes. Towards the 3rd year of implementation of new activities, the LSBs would rely more on external credit mainly from SACCOs of the District Farmers Associations. This was probably bad because of the slow withdrawal of most donors as the phase-out of the project implementation period drew closer. At this stage, LSBs were also expected to be self-sustaining. Loans were mainly acquired for purchase of foundation seed and also for facilitation of the seed certification processes.

e) Financial Monitoring: The LSB groups formed sub committees on finance and audit with clear terms of reference. These committees were oriented and trained to facilitate good financial management in the seed business. The LSBs' finance and audit committee would track the movement of their resources in and out of the seed business. Even though these committees were found to be in place, they did not have records for tracking the financial aspects (costs visa vie revenue) of the business, which was expected to be monitored through operating on the agreed upon budget. The LSBs visited also did not have up to date seed crop budgets. Budgets are important tools for controlling expenses in order to maximize revenue. Thus, absence of budgets is an internal financial control weakness for the LSBs.

f) Record management: The LSBs visited had some documentation regarding recurrent operations; the cashbook, budget, activity reports, visitor's books and training manuals. However, records that required regular update, such as budgets, activity reports and receipts had not been updated for a period between six (6) months for AMIFA and one-year KFA.

4.2.3 Market Orientation

a) Market research: The study found that LSBs did not conduct market research before introducing new cassava varieties. This omission showed limited attention to customer needs and market conditions. Market research is critical for setting appropriate prices, understanding competitors, and aligning varietal preferences with demand. Without it, LSBs risked price distortions, low uptake, weak promotion, and reduced profitability, ultimately undermining their sustainability

b) Distribution channels: The LSBs lacked marketing points at trading centres, limiting customer access to quality cassava planting materials (Table 4.6). Most farmers had to travel long distances to collect cuttings directly from LSB sites. Consequently, the majority of

customers were local farmers within the sub-county and NGOs such as LWF and the Danish Refugee Council, which purchased cuttings from AMIFA on behalf of supported farmers.

Table 4.6: Marketing Practices and Business Strategies of LSBs in Adjumani (AMIFA) and Koboko (KFA) Districts.

Criterion	**Progressive effect of LSBs under study**	
	AMIFA	KFA
Market research: (At least once annually)	No prior market research done	No prior market research done
Distribution channels: (There should be more than one distribution channel)	Single point of sale at head offices (sell from store-accessible)	Single point of sale at head offices
Business plan (3-year plan)	No business plan availed (indicated having a bi-annual plan)	No business plan availed (indicated having an annual plan)
LSB marketing strategy: (Utilize places of worship, markets, farmer to farmer, demonstration sites and also media)	Depended on local radio and church announcements Demonstration on roadside (Kureku and Mbili village) Radio talk shows, adverts	Depended on local radio and church announcements

Criterion: Source (ISSD, 2016)

The findings revealed limited diversification in the distribution channels of LSBs in both Adjumani and Koboko districts (Table 4.6). AMIFA and KFA relied solely on single points of sale at their head offices. Although these outlets were considered accessible, the absence of alternatives such as satellite outlets, mobile sales units, or partnerships with agro-input dealers restricted market reach and convenience for distant or mobility-challenged farmers. This narrow strategy fell short of the LSB model's expectation of multiple sales channels to enhance accessibility and drive wider adoption. Heavy dependence on a central selling point excluded potential clients in remote areas, reducing the seed businesses' impact on improving access to quality planting materials. The findings suggest a need for both LSBs to adopt more inclusive and decentralized sales approaches to strengthen market orientation and responsiveness.

c) Business plans: Both AMIFA and KFA claimed to have business plans bi-annual for AMIFA and annual for KFA (Table 4.6). However, neither LSB provided the documents when requested, leaving their existence and status unverified. Key informants reported that the plans outlined financial ambitions, activities, and financing strategies to guide operations. The absence of verifiable business plans raises concerns, as without documented plans it is

difficult to confirm whether the LSBs have a clear roadmap for achieving financial goals, managing activities, and securing funding.

d) LSB marketing strategy: AMIFA promoted its seed business through community radio talk shows, advert maps, and roadside demonstration plots in Kureku and Mbili villages. KFA, by contrast, relied mainly on community radio and church announcements. This shows that AMIFA adopted a broader and more aggressive marketing strategy than KFA. The use of demonstration plots gave AMIFA greater visibility, strengthened its market presence, and built customer trust by showcasing seed quality. KFA's limited efforts, however, restricted its reach and competitiveness.

4.2.4 Strategic linkages of the LSBs

a) The LSB Key partners: The main partners of the LSBs were ISSD, ABIZARDI, the DAOs, MAAIF, and the Kawanda Seed Laboratory (KSL). ISSD and ABIZARDI had the closest coordination, linking LSBs to foundation seed, agronomic inputs, seed certification services, finance, and other institutional networks. The chairperson of AMIFA confirmed this, noting, *"Our biggest support from the partnership with ABIZARDI is the increased access to foundation seed and training services."* These collaborations provided LSBs with critical resources and expertise, enhancing the quality and reliability of their products. Access to certification and financial services further supported compliance with industry standards and strengthened financial sustainability, boosting overall competitiveness.

b) Nature of the partnerships: The most valued partnerships for both LSBs were with ABIZARDI and Sub-County extension service providers (Figure 4.1). In contrast, the DAO's office was considered inefficient, as it often demanded payments for services. Farmers also noted the absence of proper communication channels among partners. For instance, quarterly multi-stakeholder meetings meant to be organized through ABIZARDI were irregular, with some years passing without any. Since regular communication and structured feedback are vital for sustaining partnerships, this gap weakened coordination and led to misaligned goals. The lack of consistent updates reduced opportunities for collaboration and timely problem-solving, while the perceived weakness of the DAO partnership further eroded trust and limited access to agricultural services.

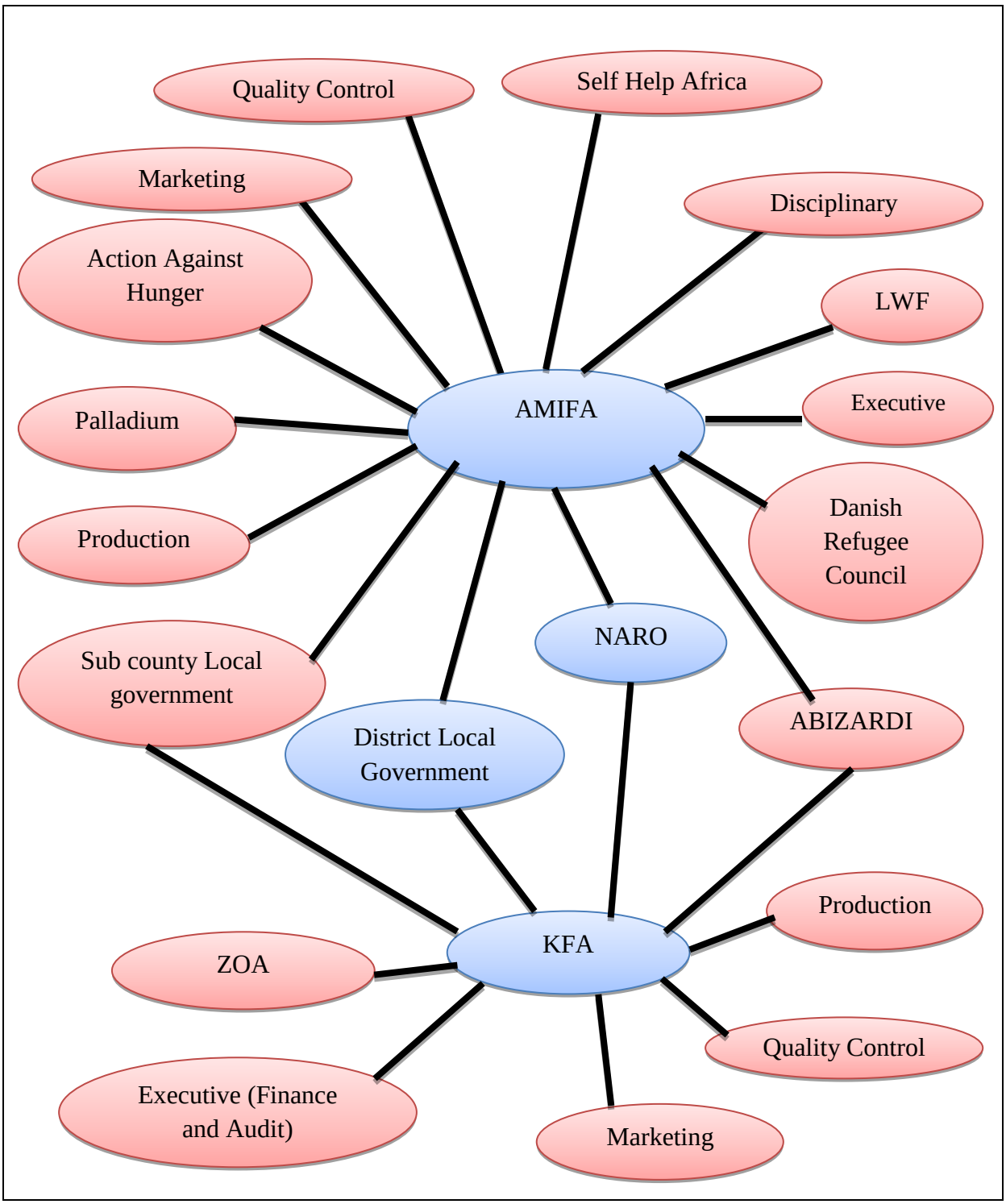

Figure 4.5: Sociogram of AMIFA and KFA: Professional Organization Structures and Strategic Linkages.

In addition, AMIFA expanded its partnerships to include Palladium, Self Help Africa, Lutheran World Federation (LWF), Danish Refugee Council (DRC), Action Against Hunger, and ACA (Figure 4.1). These partners supported market linkages and subsidized the cost of cuttings on behalf of farmers, significantly increasing seed access within AMIFA's target communities. By contrast, KFA's expansion was limited to ZOA, which focused mainly on training the LSB management team. AMIFA's broad partnerships enhanced market reach,

strengthened its presence, secured resources, and boosted sustainability. KFA's narrow partnership base, centered only on training, constrained its growth and reduced competitiveness.

c) Twinning/exchange visits: By design, LSBs were expected to host or send farmers to other groups to facilitate peer learning and knowledge exchange. However, interactions with members revealed that no such exchange programs were undertaken. The absence of twinning visits denied LSB members opportunities to learn from more successful peers, limiting exposure to innovative practices and potentially hindering growth and development.

d) Access to credit: The expectation that LSBs would access credit to obtain foundation seed had not been realized by either AMIFA or KFA. Members observed, *"The maturation of seed business is longer than an ordinary crop production cycle, so by default LSB borrowers can take long before they are able to pay back loans."* As a result, financial institutions were reluctant to extend credit, making it difficult for LSBs to secure foundation seed critical for their operations.

4.3 Farmers perceptions towards the LSB model as a pathway for accessing quality cassava planting materials

4.3.1 Access to quality cassava planting material and seed replacement

Figure 4.5 summarizes farmers' sources of quality cassava seed in the study area. Results show that 98% of respondents considered cassava an important crop, underlining its central role in local livelihoods. This trend reflects concerns raised by ISSD (2021), who noted that "access to quality cassava planting materials or cassava seed free from disease remains low in the Adjumani and Koboko districts sub-region due to irregular supply and inadequate market systems". The findings (Figure 4.5) reveal that the majority of farmers in both AMIFA (Adjumani) and KFA (Koboko) rely overwhelmingly on recycling their own cassava cuttings, with 97% and 93% respectively reporting this practice. Seed recycling remains the most dominant strategy for obtaining planting materials, largely driven by the unavailability or delayed delivery of external sources at planting time. As one farmer explained, *"If no one brings the cuttings early enough, we just use what is already in our gardens."* The reliance on recycled planting materials compromises seed quality and increase the risk of disease spread, especially cassava mosaic and brown streak diseases (Otim *et al.,* 2022). Access to formal sources is more visible than previously thought, with 97% of AMIFA farmers and 86% of KFA farmers obtaining cassava cuttings from LSBs. Those who did so emphasized trust,

proximity, and confidence in quality as key motivations. A farmer in Adjumani remarked, *"I know the quality that comes from our group, and I can talk to the member directly before I buy."* Despite the wide mix of sources, the findings suggest that seed replacement cycles remain regular. Most farmers recycled seed for three to four seasons (18–24 months) before replacement, often prompted by declining yields, disease incidence, or encouragement from extension workers and LSB campaigns. Similarly, government-supported channels such as NARO played a role for 92% of farmers in both districts, though many cited transport challenges, high costs, and bureaucracy despite acknowledging the superior quality of these sources. This indicates that although cassava is widely grown, access to high-quality seed remains limited for over a third of farmers. One key informant observed, *"When we get from NARO, we're sure it is clean and gives a good harvest, but getting it is not easy for most people."*

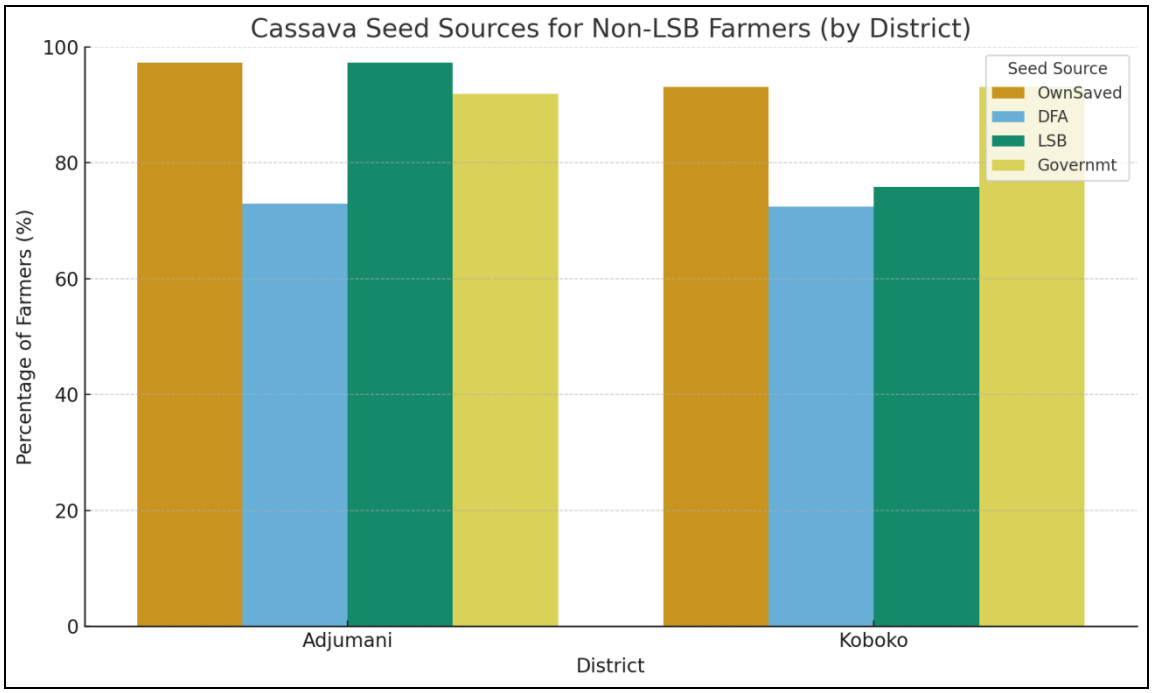

Figure 4.6: Sources of cassava planting materials by respondents in Koboko and Adjumani Districts.

District Farmer Associations (DFAs) were somewhat less common, with about 73% of farmers in both districts reporting them as a source. Financial constraints and limited access to new planting materials through DFAs, however, frequently forced farmers to extend the recycling period beyond the ideal. Farmers who replaced seed regularly typically within two seasons were more aware of cassava mosaic disease and had better access to training or extension advice. As one farmer in Koboko noted, *"After two seasons, the stems start changing color, and we are told this affects production. That's when we change."* Overall, these findings highlight weak distribution systems, high dependence on recycling, and

inconsistent seed replacement, particularly in Koboko, underscoring the need to strengthen LSB outreach, expand government and research-based seed channels, and promote regular replacement cycles to improve varietal quality and productivity.

4.3.2 Access to support services

Farmers' access to key support services; peer networks, extension training, market information, and credit was assessed as a potential enabler for utilizing the LSB model. To gauge the perceptions of non-LSB member farmers (categories 1 and 2), responses to structured survey items were analyzed using a descriptive statistical analysis of Likert-type data**.** (Level of satisfaction: 1= Very satisfied 2= Satisfied 3= Dissatisfied 4= No response)). This involved calculating frequency distributions and percentages for each response category. The central tendency of responses for each service was summarized to identify prevailing attitudes. The Likert scale analysis indicated generally supportive attitudes among non-participant farmers (categories 1 and 2) towards key enablers of access to quality planting materials (Figure 4.6).

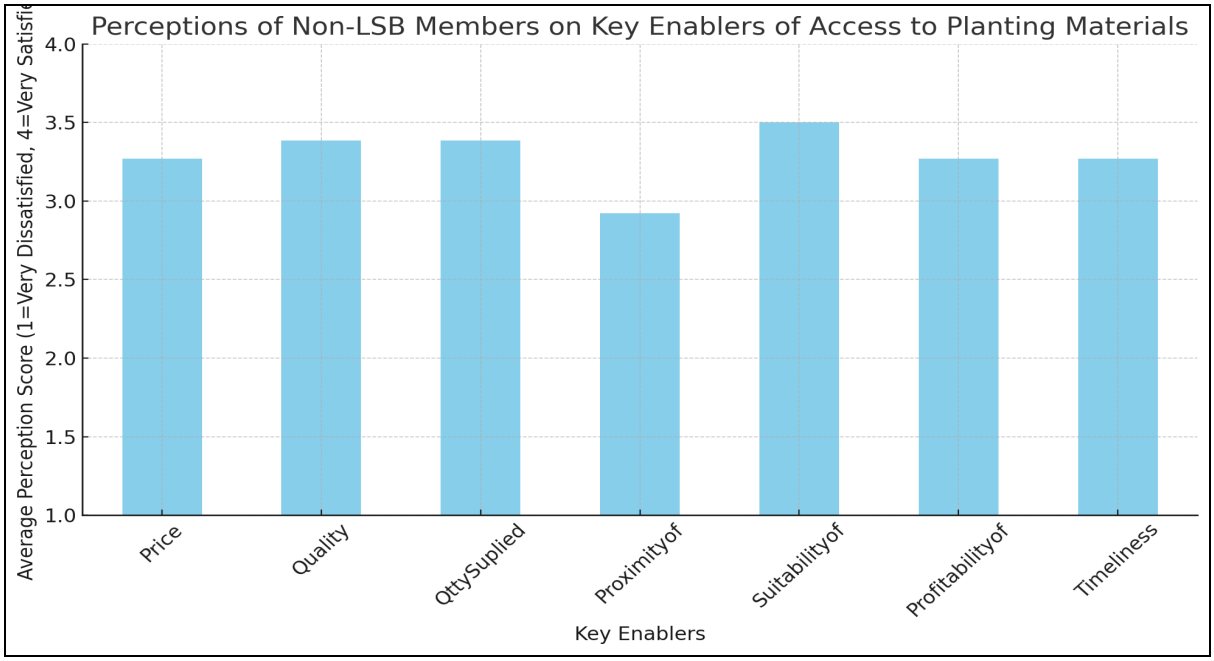

Figure 4.7: Perceptions of Non-LSB members on Key enablers of access to planting Materials.

The findings (Table 4.7) show that non-members who purchased cassava cuttings from the LSB (category 1 farmers) reported greater access to support services such as market information, credit, training, and peer learning compared to those who did not purchase seed (Category 2). Category 1 farmers benefited more, while Category 2 farmers faced reduced

exposure, limiting their ability to identify and use quality planting materials. This gap increases the likelihood of recycling poor quality planting materials due to inadequate awareness of improved varieties and agronomic practices. Among the LSB members, 86% reported receiving training, 89% had access to market information, 83% accessed peer support, and 64% had access to credit facilities. This highlights a persistent gap in financial services, which could be limiting the buying of quality cassava seed among farmers. These findings emphasize the importance of enhancing informational outreach and strengthening social networks while addressing financial barriers to seed acquisition. For non-member buyers, the corresponding figures were 79%, 80%, 64%, and 56%, respectively. These results indicate that training and market information are the most distinguishing factors, with LSB members reporting substantially higher access compared to non-member buyers.

Table 4.7: Perceptions on access to support services compared among members and non-LSB members in both Adjumani and Koboko Districts.

	LSB members		**Non LSB members**		**Chi-Square p-value**
Support services	% Accessed seed	% Didn't access	% Accessed seed	% Didn't access seed	
Peer support	83	17	64	36	0.132
Extension Training	86	14	79	21	**0.005***
Market Information	89	11	80	20	**0.008***
Credit facilities	64	36	56	44	0.227

Note: *Statistical significance tested at the 95% confidence level ($\alpha = 0.05$). Bold p-values with an asterisk (*) indicate a statistically significant association between farmer category and access to that service ($p < 0.05$).*

Chi-square results above (Table 4.7) indicate a significant association between farmer type and access to both extension training ($p = 0.005$) and market information ($p = 0.008$). The differences suggest that these services play a pivotal role in influencing farmers' engagement with Local Seed Businesses. Access to such services likely enhances farmers' awareness, confidence, and willingness to invest in quality cassava seed. They also suggest that access to these services strongly influences a farmer's decision to buy from LSBs. In contrast, access to peer support ($p = 0.132$) and credit services ($p = 0.227$) did not show statistically significant differences across groups, suggesting that although these services add value to farmers, they are not the primary drivers of purchasing decisions within seed systems. Overall, the findings underscore the critical influence of institutional support services particularly training and market information in shaping farmer participation in structured seed systems, highlighting the need to strengthen these components within LSB outreach and extension strategies for promoting access to quality cassava planting materials.

A t-test was also conducted to evaluate the effect of Local Seed Business (LSB) membership on farmers' access to quality cassava planting materials. The analysis compared the mean access scores of LSB members and non-members. The assumption of homogeneity of variances was met, as indicated by a non-significant Levene's test ($F = 0.233$, $p = .630$). The results revealed a statistically significant difference between the two groups, $t(127) = -6.38$, $p < .001$. LSB members reported a substantially lower mean access score ($M = 1.70$, $SD = 0.71$) compared to non-members ($M = 2.47$, $SD = 0.66$). In the measurement scale employed for this analysis, a lower numerical value denotes a superior level of access. The mean difference of -0.77 points, with a 95% confidence interval ranging from -1.01 to -0.53, confirms a consistent and meaningful advantage for LSB members. This finding is further substantiated by a Cohen's d value of -1.13, which signifies a very large effect size according to conventional thresholds. This generally indicates that LSBs members have higher opportunities to access cassava planting materials from the LSBs than non-members.

Table 4.8: T-test results comparing LSB Members and Non-LSB Members on accessing quality cassava planting materials

Group	*N*	*M*	*SD*	t	*df*	p	Mean Difference [95% CI]	Cohen's d [95% CI]
LSB Members	63	1.70	0.71	-6.38	127	<.001	-0.77 [-1.01, -0.53]	-1.13 [-1.50, -0.75]
Non-LSB Members	66	2.47	0.66					

Note: LSB = Local Seed Business. The dependent variable is access to quality cassava planting materials, where a lower mean score indicates better access. Levene's test indicated equal variances ($F = 0.233$, *p* = .630). CI = Confidence Interval.

4.3.3 Perceptions regarding farmers' satisfaction with the LSB in enhancing access

Perceptions regarding level of satisfaction were only measured for respondents who had accessed and utilized LSB produced cassava cuttings and they were only 78 in number (Table 4.8). Generally, farmers who had bought seed from the LSB were satisfied with the LSB's contribution to enhancing their access to cassava planting materials. Seed access, according to the African Seed Access Index, encompasses six dimensions, including affordability/price, availability of seed in the required quality and quantity, proximity of seed source, suitability of seed, profitability of variety and timeliness in delivery (TASAI, 2015). Across the access dimensions, farmers' levels of satisfaction regarding LSB fulfilling each dimension were very high, above 90%.

Table 4.9: Farmers Level of Satisfaction with the LSBs in enhancing access (n=78) in Adjumani and Koboko districts.

Seed Access dimensions	Respondents Satisfied (%)
Price	94
Quality availability	97
Quantity availability	99
Proximity of the seed source	90
Suitability of the variety	97
Profitability of the variety	97
Timeliness in delivery	99

A comparison of farmers' satisfaction with the LSBs seed was conducted using Chi-square tests of independence (Table 4.9). This non-parametric approach assessed whether satisfaction levels across key seed attributes varied significantly. The analysis identified seed price as the only attribute with a statistically significant difference when compared against seed quality, ($\chi^2 = 18.227$, df = 6, p = 0.05). This contrast points to a genuine concern about cost of the LSB planting material or perceived value for money. Therefore, price satisfaction stands out as a key area of divergence, addressing pricing concerns through local consultations, cost transparency, or alignment of prices with perceived quality may be an effective strategy to boost confidence and uptake of LSB-supplied cassava seed in that district. For other service attributes seed quality, proximity of seed source, variety suitability, profitability, and timeliness of delivery no statistically significant differences were observed between districts, with all p-values exceeding 0.05 (Table 4.10).

Table 4.10: Chi-square test results for associations between farmers' price satisfaction and other seed-attributes

Factor compared with Price	Chi-square statistic	p-value
Quality of seed	18.23	0.01
Proximity of seed source	8.68	0.19
Suitability of the variety	7.12	0.31
Profitability of the variety	10.25	0.33
Timeliness in delivery	11.17	0.08

A district-level comparison of farmers' satisfaction with LSBs was conducted using Analysis Of Variance (ANOVA). When data was disaggregated across the two LSBs (Table 4.10), interestingly, it was revealed that farmers who accessed seed through KFA were relatively more satisfied with the quality, quantity, proximity, suitability, profitability and timeliness delivery of seed acquired through the LSB than their counterparts in AMIFA. On the other hand, AMIFA farmers were relatively more satisfied with the pricing of the seeds than their counterparts in KFA. An in-depth comparison of mean satisfaction levels between AMIFA and KFA Local Seed Businesses (LSBs) shows that farmer perceptions were largely similar

across most service dimensions, with only minor variations of less than 0.1 to 0.2 points in areas such as seed quality, quantity supplied, proximity of the source, variety suitability, and timeliness of delivery, indicating broadly comparable experiences in both Adjumani and Koboko. However, it was still important to test for the statistical significance of these results to establish their accuracy. Notable differences were observed in seed pricing and perceived profitability, where AMIFA farmers reported greater satisfaction with pricing, reflected in a lower mean score of 1.512 compared to 1.865 for KFA, while KFA farmers expressed slightly higher satisfaction with profitability, recording a mean of 1.457 compared to 1.756 for AMIFA (Table 4.10). These differences appear to be influenced by geographical and economic contexts. KFA operates in a more remote and logistically disconnected area, which results in higher transportation costs for farmers accessing seed. These access challenges contribute to farmers in Koboko perceiving seed prices as less favorable, even though the quality may be comparable. In such remote locations, many farmers resort to informal channels such as recycling cuttings or obtaining seed through peer exchange.

Table 4.11: Farmers Level of Satisfaction with the LSBs in enhancing access to cassava planting materials across the two LSBs in Adjumani and Koboko Districts

Seed access dimensions		**Std. Deviation**	**Std. Error**
	Category		
Price	AMIFA	0.506	0.079
	KFA	0.631	0.104
	Total	0.592	0.067
Quality	AMIFA	0.536	0.084
	KFA	0.558	0.092
	Total	0.545	0.062
Quantity Supplied	AMIFA	0.550	0.086
	KFA	0.504	0.084
	Total	0.529	0.060
Proximity of the source	AMIFA	0.625	0.098
	KFA	0.553	0.103
	Total	0.604	0.072
Suitability of the variety	AMIFA	0.536	0.084
	KFA	0.564	0.098
	Total	0.547	0.064
Profitability of the variety	AMIFA	0.489	0.076
	KFA	0.561	0.095
	Total	0.541	0.062
Timeliness in delivery	AMIFA	0.530	0.083
	KFA	0.507	0.083
	Total	0.523	0.059

In contrast (Table 4.11), AMIFA serves farmers who are geographically closer to the LSB distribution point; leading to lower transport-related expenses and making the LSB seed

prices appear more reasonable. As reported by farmers, the price of a bag of cassava cuttings from an LSB ranged between UGX 15,000 and 30,000, whereas commercial sellers charged between UGX 40,000 and 60,000 for a similar quantity. While service delivery by both AMIFA and KFA is generally consistent, farmer satisfaction with price and profitability is shaped by spatial and economic access factors. Enhancing last mile delivery and reducing distribution barriers in more remote areas could further improve equity in seed access and farmer satisfaction.

A further analysis with ANOVA (Table 4.12) revealed that significant differences were found in only two dimensions: price and profitability of the variety For seed price, AMIFA farmers reported significantly higher satisfaction compared to those in KFA ($F = 7.483$, $p = 0.008$), suggesting that farmers served by AMIFA perceived the seed pricing to be more favourable. This could be attributed to AMIFA's better logistical positioning or lower cost structure, as highlighted in earlier discussions. Similarly, profitability showed a statistically significant difference between the two LSBs ($F = 6.168$, $p = 0.015$). Farmers from KFA expressed higher satisfaction with the profitability of the cassava varieties they received, implying that despite possibly higher prices, the returns from production may be more substantial or better recognized in KFA's context.

In contrast, there were no statistically significant differences between AMIFA and KFA for the remaining seed access dimensions quality ($p = 0.452$), quantity supplied ($p = 0.338$), proximity of the seed source ($p = 0.092$), suitability of the variety ($p = 0.492$), and timeliness in delivery ($p = 0.148$). This indicates a generally uniform level of satisfaction across both LSBs for these parameters, reflecting consistent service delivery in these areas. While both LSBs performed comparably across most seed access aspects, differences in satisfaction with price and profitability point to important contextual factors influencing farmers' perceptions such as transport costs, market integration, and yield performance. These findings from Table 4.12 suggest that targeted improvements in pricing transparency and profitability awareness could further strengthen farmer trust and participation in LSB systems.

Table 4.12: ANOVA results comparing farmers' satisfaction with seed access dimensions between AMIFA AND KFA Local Seed Business

Seed access dimensions	Category	Df	Mean Square	F	Sig.
Price	AMIFA	1	2.419	**7.483**	**.008***
	KFA	76	.323		
	Total	77			
Quality	AMIFA	1	.170	.571	.452
	KFA	76	.299		
	Total	77			
Quantity Supplied	AMIFA	1	.260	.930	.338
	KFA	75	.280		
	Total	76			
Proximity of the source	AMIFA	1	1.039	2.923	.092
	KFA	68	.355		
	Total	69			
Suitability of the variety	AMIFA	1	.144	.477	.492
	KFA	72	.301		
	Total	73			
Profitability of the variety	AMIFA	1	1.688	**6.168**	**.015***
	KFA	74	.274		
	Total	75			
Timeliness in delivery	AMIFA	1	.576	2.138	.148
	KFA	76	.269		
	Total	77			

Note: ANOVA tests was conducted at the 95% confidence level ($\alpha = 0.05$). Bold F-statistics and p-values (Sig.) with an asterisk (*) indicate a statistically significant difference in mean satisfaction scores between AMIFA and KFA.

4.4 Factors influencing access to quality cassava planting materials through the LSBs

The descriptive data on the perceptions of the farmers were provided in the different tables summarizes the findings obtained from binary logistic regression analysis. The analysis of factors influencing access to quality cassava planting materials revealed several key drivers rooted in socio-economic, institutional, and geographic conditions (Table 4.13).

Table 4.13: Factors influencing farmers' access to quality cassava cuttings in Adjumani and Koboko districts

Category	Coeff	Odds Ratio Exp(β)	Z Value	P>z
Age	-0.061	0.941	-1.650	0.098
Sex	0.935	2.548	1.090	0.276
Marital status	-0.361	0.697	-0.560	0.579
Education level	0.503	1.654	1.460	0.146
Participation in social networks	1.237	3.446	1.760	0.078
Availability of labour	0.476	**1.609**	2.430	**0.015***
Proximity to source	1.741	**5.707**	2.170	**0.042***
Contribution of cassava to household income	0.054	**1.056**	2.140	**0.034***
Access to training/extension	1.285	**3.615**	0.340	**0.044***
Access to credit	1.927	**6.871**	2.660	**0.006***
Seed replacement	1.522	**4.582**	2.150	**0.031***
Access to market information	7.989	**2945.271**	5.550	**0.000***
Price of the seed	-1.240	**0.289**	-2.100	**0.036***
Cons	-18.650	0.000	-3.470	0.001

Model Summary: No of observations = 143, Log likelihood = -35.644223, LR chi (13) = 154.67, Prob> chi2 = 0.0000, Pseudo R^2 = 0.6845 (68%). * = p≤ .05, ** = p≤ .01, *** = p≤ .001, All tests were conducted at the 95% confidence level. The **Odds Ratio Exp(β)** quantifies the change in likelihood: a ratio >1 increases odds of access, <1 decreases odds. For instance, an odds ratio of 6.871 for "Access to credit" means farmers with credit access had nearly 7 times higher odds of accessing LSB seed than those without, all else being equal.

While socio-demographic factors such as age, sex, marital status, and education level were not statistically significant in determining access, descriptive results from Section 4.1 highlighted their contextual relevance. For instance, Category 1 farmers (those accessing LSB seed) had a higher average age (44 years) and more farming experience (24 years), compared to 40 years and 21 years respectively for Category 2 farmers (not accessing). Additionally, Category 1 farmers had larger average land holdings (3.2 acres vs. 2.3 acres), suggesting that land availability is a supporting factor in making investment decisions like seed purchase.

Among the significant determinants, proximity to LSBs ($\beta = 1.741$, $p \leq 0.05$, OR = 5.707) emerged as a critical factor. Farmers residing closer to LSB sites were more likely to access cassava cuttings due to reduced transport costs and better awareness of seed availability.

Those further away, particularly in remote locations served by KFA, often opted for informal sources like social seed exchanges due to logistical difficulties and cost constraints. Access to market information ($\beta = 7.989$, $p \leq 0.001$, OR = 2945.271) and extension training ($p = 0.008$) significantly influenced seed access. Category 1 farmers were more likely to have interacted with extension workers or been exposed to LSB outreach campaigns, while Category 2 farmers lacked timely and accurate information, leading to limited awareness of the benefits or availability of LSB-produced seed. This gap in market and extension information was particularly evident in areas where extension services were infrequent or required financial facilitation.

Credit access ($\beta = 1.927$, $p \leq 0.01$, OR = 6.871) was also found to be an enabler. However, only 49.7% of farmers had access to credit, and even among those who did, few used it specifically for seed purchase. For Category 2 farmers, lack of financial flexibility was a deterrent to buying LSB seed, especially when free or recycled materials were available through informal channels. Price sensitivity further influenced decision-making, with some farmers noting that UGX 15,000 to 30,000 per bag was high compared to free alternatives. This cost barrier discouraged participation in LSB-led seed distribution. Moreover, seed replacement behavior ($\beta = 1.522$, $p \leq 0.05$, OR = 4.582) played a role farmers who routinely replaced seed stocks were more likely to engage with LSBs. In contrast, 61% of the total sample reported recycling cassava stems from previous seasons, particularly Category 2 farmers, which reduced demand for new planting material. Cultural practices and the traditional exchange of cuttings within social networks reinforced this tendency, especially in areas with low LSB visibility or outreach.

While the socio-demographic background provides some context, the main factors influencing access to cassava cuttings from LSBs were proximity to seed sources, access to market and extension information, availability of credit, price sensitivity, and seed replacement behavior. Category 2 farmers, though often aware of LSBs, cited long distances, high costs, lack of financial access, and continued reliance on free social exchange systems as their primary reasons for not accessing LSB seeds. Addressing these barriers particularly through improved outreach, pricing strategies, and decentralized distribution would be essential for enhancing LSB reach and performance.

The likelihood ratio chi-square value of 154.67 ($p = 0.0000$) demonstrated that the model fitted well the data set. This suggested that the considered variables significantly explained access to quality cassava planting materials. The pseudo R2 was high at 68%; this shows that

the model provides a good fit to the data regarding accessing quality cassava cuttings. The Beta coefficient is a measure of sensitivity or correlation of a given variable against another. In this case it compares the strength of the effect of each individual independent variable to the dichotomous dependent variable. The higher the absolute value of the beta coefficient here, the stronger the effect. The positive coefficients (Table 4.13) for availability of labour ($\beta = 0.476$, $p \leq .05$, OR = 1.609), proximity to selling points ($\beta = 1.741$, $p \leq .05$, OR = 5.707), status of cassava in household income ($\beta = 0.054$, $p \leq .05$, OR = 1.056), training/ extension services ($\beta = 1.285$, $p \leq .01$, OR = 3.615), access to credit facility ($\beta = 1.927$, $p \leq .01$, OR = 6.871), access to market information ($\beta = 7.989$, $p \leq .001$, OR = 2945.271) and seed replacement ($\beta = 1.522$, $p \leq .05$, OR = 4.582) indicate that the access to quality cassava cuttings becomes more likely as the status of the preceding factors is enhanced.

The odds ratios for, access to market information, proximity to selling points, access to credit facilities, seed replacement and access training/ extension services, that were greater than one, (1) indicate a very high likelihood by 68% of farmers access to quality cassava cuttings through the LSB as status of the said predictors is enhanced/increased. Odds ratio for status of cassava in contributing to household income (OR = 1.056) and that of availability of labour (OR = 1.609) that were shown to be greater than one (1) indicate that access to cassava cuttings is more likely to occur as the status of the contribution of cassava to household income and the available labour to household increases. The negative coefficient of price of the quality cassava cutting ($\beta = -1.240$, $p \leq .05$, OR = 0.289) indicated that access to quality cutting became highly less likely to occur as the price of quality cassava cuttings is increased.

CHAPTER FIVE: DISCUSSION OF RESULTS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Implementation of the LSB model in practice in enhancing access to quality cassava planting materials

The implementation of the Local Seed Business (LSB) model in Adjumani and Koboko districts aimed to enhance access to quality cassava planting materials by decentralizing seed production and bringing it closer to smallholder farmers. Through organizing farmer groups like AMIFA and KFA, training them in agronomic practices, and supplying them with foundation seed, the model sought to ensure timely, affordable, and locally adapted seed availability. However, inconsistencies in quality assurance, weak internal governance, and limited market orientation hindered its effectiveness. Where implementation aligned with the model such as ensuring proximity and timely delivery farmers reported improved access. Thus, effective LSB implementation is directly linked to enhanced access to quality cassava planting materials, while weak execution undermines its potential impact. Farmers who accessed cassava cuttings from LSBs expressed strong satisfaction with seed quality and variety profitability key components of perceived seed attributes in the conceptual framework. The high satisfaction rates for quality, for profitability, indicate that where the LSBs successfully delivered on the technical pillar of their mandate, they earned farmer trust. This finding aligns with literature emphasizing that perceived yield performance and disease resistance are fundamental to seed adoption (Mutonhi et al., 2021; Turyagyenda et al., 2022). The significant difference in satisfaction with profitability between AMIFA and KFA further shows that the implementation of the technical and market orientation pillars directly shaped this perception. KFA's remote location, which complicated its market linkages, likely affected how farmers valued the economic return of its varieties, demonstrating that perceptions of seed quality are not absolute but are mediated by the LSB's operational context and market integration.

a) Technical equipment: The implementation of the technical equipment pillar showed clear disparities between AMIFA and KFA, with AMIFA demonstrating significantly stronger performance. AMIFA's advantage stemmed from both its institutional maturity and its access to extensive technical support. Founded seven years earlier than KFA, AMIFA had evolved from a church-based savings group into a well-structured seed enterprise. This longevity contributed to a more experienced implementation team and stronger organizational capacity. Moreover, AMIFA benefited from 19 training and extension sessions delivered by both

government agencies and NGOs, compared to only three sessions received by KFA. These trainings played a critical role in enhancing farmers' skills in agronomy, seed quality assurance, and business operations factors widely recognized as vital for sustainable LSB performance (ISSD-Uganda, 2012; Westengen *et al.*, 2014; Smith *et al.*, 2020; Johnson & Thomson, 2021).

As a result of this robust training and support, AMIFA was able to successfully implement the required technical procedures for producing quality-declared seed. This included adhering to quality control protocols such as regular field inspections, proper agronomic practices, and submission of planting returns to the District Agricultural Office (DAO). These practices ensured that the cassava planting materials produced were of high quality and met certification standards, thereby enhancing farmers' access to clean, disease-free cassava cuttings. Conversely, KFA struggled with implementation. The group failed to submit planting returns, missed inspection windows, and lacked functioning quality control mechanisms. This severely compromised its ability to produce certified seed and limited access for farmers, who resorted to informal or recycled planting materials of questionable quality.

These findings align with those of N2Africa (2016), which highlighted that LSBs failing to implement quality assurance protocols often produced seed with poor germination rates. Similarly, Otim et al. (2022) emphasized the risk of disease spread through uninspected cassava cuttings, particularly cassava mosaic and brown streak diseases. The discrepancy between AMIFA and KFA's performance also illustrates Louwaars and De Boef's (2012) assertion that the absence of systematic quality assurance leads to reduced seed quality and diminished market credibility. Farmers' preference for AMIFA's seed, as evidenced by higher demand, further affirms that quality assurance not only enhances access but also builds trust and stimulates uptake. Therefore, while the technical pillar of the LSB model proved effective in enhancing access where properly implemented, the gaps observed in KFA underscore the need for continuous training, external support, and strict adherence to quality standards to ensure the model's success.

b) Professional organization: In terms of professional organization, both LSBs had foundational structures in place constitutions, defined committees, and basic administrative hierarchies but their operationalization was weak. The majority of LSBs did not hold regular financial planning meetings, had out dated or missing budgets, and lacked functioning monitoring systems. This poorly executed implementation limit their capacity to mobilize

resources, plan seed production, or meet compliance standards key elements that influence timely and adequate seed availability. These issues mirror concerns raised by Fanout *et al*., (2018) and Adong & Mwaura (2019), who emphasized that poor internal governance compromises LSB sustainability,. In this study, such gaps directly reduced farmers' access to seed, especially during peak planting seasons when coordinated planning would have enabled adequate supply. The results suggest that without strengthening the organizational backbone of LSBs, even technically capable groups risk operational stagnation and loss of farmer trust.

c) Market orientation: The implementation of market orientation strategies was another area where results revealed significant weaknesses, especially for KFA. AMIFA demonstrated some initiative by advertising on community radio, establishing demonstration plots, and engaging in limited promotional activities, which increased its seed visibility and attracted buyers. However, both LSBs lacked evidence of structured market research, customer feedback mechanisms, or defined business plans. As a result, LSBs are unable to match supply with demand or understand varietal preferences and seasonal market needs factors critical for increasing uptake. Farmers located farther from LSB headquarters, who might have benefited from decentralized distribution points, are excluded, leading to reduced access. This aligns with findings by Muigai et al. (2010) that ineffective marketing and distribution systems severely limit seed access in decentralized seed systems. These results indicate that the market orientation component of the LSB model is weakly implemented, and unless addressed, will continue to hinder the scaling of quality cassava seed access.

d) Strategic linkages of the LSBs: Strategic partnerships were partially implemented but showed substantial operational gaps. While both AMIFA and KFA had initial connections with research institutions and extension agents, on-going collaboration was limited. Joint planning, resource sharing, and peer learning activities like exchange visits were mostly absent. Farmers reported that district agricultural officers (DAOs) were either unresponsive or required payment for services like inspection, making the quality assurance process inaccessible for many LSBs. This limited access to certification and support services critically constrained the ability of LSBs to produce credible seed. These findings resonate with studies by ISSD (2021) and Dawit (2011), which argue that weak institutional linkages restrict LSB effectiveness. The results suggest that while the presence of strategic linkages exists on paper, their practical implementation was inadequate, reducing the flow of resources and technical support essential for sustained access to quality seed.

Adong & Mwaura, 2019 highlight the importance of strategic partnerships in enhancing the effectiveness and sustainability of agricultural initiatives. Collaborative networks can provide critical resources, facilitate knowledge exchange, and support capacity building efforts (Gillespie & Strachan, 2021; Adhikari *et al.,* 2022). Ensuring robust communication and feedback mechanisms within these partnerships is essential for achieving desired outcomes (Chowdhury *et al*., 2023). Additionally, enhancing access to financial services through innovative credit schemes can significantly improve the operational capacity of LSBs (Kansiime *et al.,* 2020; Maredia *et al.,* 2021).

Overall, the results demonstrate that although some elements of the LSB model were in place, there were significant implementation gaps across all four pillars. These gaps particularly in governance, marketing, and strategic partnerships contributed to limited access to quality cassava planting materials for many farmers, especially those in remote areas or linked to underperforming LSBs like KFA. The findings imply that the LSB model, while promising, cannot achieve its full potential without deliberate efforts to strengthen the implementation of its core components. Echoing studies by Mastenbroek et al. (2017) and Mulatu & Mekonnen (2020), this study reinforces the need for targeted capacity-building in business skills, market research, and institutional networking to transform LSBs into reliable, farmer-centered seed enterprises.

5.1.2 Farmers' perceptions towards local seed business model

The accessibility dimension of the framework, encompassing affordability, physical proximity, timeliness, and quantity, was a major point of differentiation in farmer perceptions. While satisfaction with proximity and timeliness was generally high, a critical divergence emerged regarding price. AMIFA farmers reported significantly higher price satisfaction than KFA farmers. This can be directly linked to differences in their market orientation and strategic linkages. AMIFA's broader network of NGO partnerships (e.g., Palladium, LWF) that subsidized costs for buyers, and its more active promotional strategies, likely made its prices seem more reasonable and justifiable. In contrast, KFA's more limited outreach and dependence on a single, remote sales point exacerbated the perceived burden of cost for distant farmers, for whom transport expenses compounded the sticker price. This reflects the conceptual link between an LSB's marketing strategy and the farmer's ultimate perception of affordability and convenience. Furthermore, although not statistically significant across groups, the noted frustration over "limited volumes" and "late delivery" points to weaknesses

in production planning and supply chain management elements of the professional organization pillar that negatively impacted the perceived reliability and availability of seed.

Farmers who accessed quality cassava planting materials through the LSBs expressed overwhelmingly positive attitudes towards various dimensions of the LSB model. Farmers' attitudes offer the foundation for most decisions that change agents have to take if they are to benefit from the interventions, (Rogers, 1983; Tadesse *et al.,* 2022). Factors such as access to training, market information, the quantity of seed supplied, proximity, and timeliness in delivery were found to be significantly associated with farmers' decisions to source seed from LSBs. Yet still AMIFA outpaced KFA due to better access to extension services and the implementation of community embedded strategies like demonstration plots and localized training sessions. These have proven effective in promoting new agricultural practices, shaping perceptions in improving the uptake (Chowa *et al.*, 2021; Tadesse *et al.,* 2022).

Surprisingly, some farmers expressed positive attitudes toward the LSBs despite not purchasing planting materials from them. A plausible explanation for this is that cassava, being a vegetatively propagated crop, is often accessed through informal social exchanges such as borrowing or sharing among peers. While the LSBs contributed to improved access to quality seed through both direct and indirect pathways, farmers may still have relied on traditional sources due to convenience or established social norms. It is also possible for farmers to hold favourable perceptions of a new technology without adopting it, particularly in contexts where they have not yet had first-hand experience with it (Rogers, 1995; Ndaula *et al.,* 2020).

However, the study found no significant difference in perceptions between those who bought and those who did not buy LSBs cassava cuttings regarding access to credit, price, quality, suitability, and profitability. This indifference in perceptions may be attributed to the social structure within which cassava production occurs. In many rural communities, seeds are often exchanged among peers, leading to uniform perceptions about them regardless of their source. Additionally, the limited use of credit facilities for purchasing planting materials highlights the need for more accessible financial services and diversified pricing strategies that cater to the varying needs of different segments of farmers (Ndiritu *et al.,* 2021; Melesse *et al.,* 2023). This suggests that the LSB model's success depends not only on the quality of seed provided, but also on how well the model integrates with existing social and economic structures.

These findings are consistent with recent studies indicating that social networks and community practices play a critical role in shaping farmers' perceptions and decisions regarding agricultural technologies (Olaolu *et al.,* 2022; Kansiime *et al.,* 2023). In many cases, social exchanges act as a primary source of seed, thereby significantly influencing how farmers perceive and adopt new varieties (Ndiritu *et al.,* 2021; Melesse *et al.,* 2023).

5.1.3 Factors influencing farmers access to quality cassava planting materials

The study identified several key factors that significantly influenced farmers' access to quality cassava planting materials through the Local Seed Businesses (LSBs). Among these, access to market information stood out as the most critical. Farmers who had timely and accurate information about the availability, pricing, and quality of cassava cuttings were more likely to purchase planting materials from LSBs (Table 4.13). This highlights the vital role that information dissemination plays in enabling informed decision-making. Additionally, physical proximity to the LSB, access to credit services, and farmers' willingness to replace old planting materials were also significant determinants (Table 4.13). Farmers located closer to the LSBs had greater physical access, while those with access to credit could afford the relatively higher costs of quality-declared seed. Furthermore, farmers who demonstrated openness to adopting new, improved planting materials were more likely to engage with LSBs. These findings underscore the multifaceted nature of seed access, showing that it is not solely a matter of availability, but also of information, affordability, and behavioural inclination. Similar conclusions were drawn by Thijssen and Borman (2012), Wendiro et al. (2014), and Meijer et al. (2015), who emphasized the importance of market awareness and behavioural change in technology uptake. Rubyogo et al. (2008) also noted that limited access to performance-related information was a major barrier to the adoption of improved seed varieties in Africa, reinforcing the need for more structured and inclusive communication strategies within seed systems.

Proximity played a crucial role in determining farmers' access to quality cassava cuttings. Farmers living closer to the LSBs easily obtained planting materials due to reduced transaction costs. Conversely, longer distances make alternative sources of seed like social exchanges more attractive (Fitiwi *et al.,* 2010; Wegary, 2013; Akintunde & Obayelu, 2016 ;). These agree with the observations of Mohamed (2004) and McGuirre (2008), who posited that access to quality seed was sensitive to the distance farmers travelled to the seed source. Another study by Waleign (2008) in Ethiopia confirmed that famers with better access to seed from a particular "Kebele" and "Woreda", were those closer to the LSB. *Rajendrana et al.,*

(2016) reported that the relative location of the seed source to farmers' fields determined the level of awareness, timely availability and affordability of quality seed which are critical factors in influencing access.

Access to credit was positively correlated with access to quality cassava planting materials as well, as credit provides farmers with the necessary financial resource to acquire seed and other essential inputs. This finding aligns with previous research indicating that access to credit is a significant enabler to uptake of improved agricultural technologies, as it alleviates financial constraints and allows farmers to invest in quality inputs (Kiplimo, 2013; Lafayette, 2017). These results corroborate with the findings of Pinamang and Owusu (2015) in rural Ghana that households that had access to credit were more likely to buy improved cassava varieties.

Seed replacement was another significant factor; farmers who replaced their existing seed stock were more likely to source new cassava planting materials from LSBs. This trend indicates a growing demand for quality seeds among farmers who recognize the benefits of using certified planting materials (ISSD-Uganda, 2015e) (Figure 4.2). A study by Wegary (2013), also found that access to quality cassava cuttings through the LSBs was more likely among farmers who replace their seed stock. Barker et al. (2009) suggests that seed replacement is very important in enabling genetic vigour and the freeness of the planting material from diseases.

On the other hand, the study found that the high price of cassava planting materials was negatively associated with farmers' access to these materials. Higher costs discouraged farmers from purchasing quality cassava cuttings from LSBs, especially in cases where informal, cost-free alternatives were available. LSBs represent a transitional seed access option where farmers are expected to use either the for-fee formal system or the freely accessible informal seed. This suggests that price sensitive farmers may be deterred from engaging with LSBs if the cost of planting materials is perceived as too high, highlighting the need for LSBs to consider pricing strategies that are more inclusive and reflect the economic realities of their target markets (FAO & ICRISAT, 2015). Sen (2013) and Kiross (2015) also reported low price to influence farmers' decisions to buy rice seeds and locally produced quality hybrid maize, respectively.

Further, the findings revealed that access to quality cassava cuttings through the LSB was likely to occur, although at a less responsive rate, as the contribution of cassava to household

income and as household available labour increases. This positive association resonates with the findings of Ayodele et al. (2016) who reported that the monetary value of a crop to a household influences a farmers' decision to pursue the production of such a crop, so as to match its production with family needs (Akintunde and Obayelu, 2016). In the case of labour, farmers tend to rely on family members, implying that where a crop is labour intensive as it is expected of cassava, households with labour are more likely to implement activities such as ploughing and weeding on time, which could increase the demand for quality cassava cuttings from LSBs (Fermont *et al.*, 2009; Mwangi and Kariuki, 2015).

While previous studies have suggested that socio-demographic factors such as age, sex, and education level significantly influence access to quality seeds (Ayodele *et al.,* 2016; Acheampong & Owusu, 2015; Kavia *et al.,* 2007), this study found no statistically significant association between these variables and farmers' access to quality cassava planting materials through LSBs. One possible explanation for this discrepancy lies in the socio-cultural and economic context of the study area. The communities in Adjumani and Koboko are largely homogenous in terms of livelihood practices, with both men and women engaged equally in cassava production due to its importance as a staple crop. Additionally, because the LSBs were located within the same communities and operated under relatively uniform conditions, the variation in access due to socio-demographic differences may have been minimized.

Another possible reason is methodological. This study employed a binary logistic regression model using a specific set of variables, and the data collection tools though comprehensive were based on structured interviews and self-reports, which may not fully capture the nuanced influence of demographic characteristics unless explored qualitatively. In contrast, studies that found significant relationships often used mixed-method approaches or focused on crops with higher socio-cultural or education-related barriers to access. Furthermore, the high level of informality and reliance on social seed exchange networks in Adjumani and Koboko districts may have equalized access among farmers, regardless of their demographic profiles. These factors combined suggest that in contexts where cassava is culturally and economically central, and where LSBs are embedded within communities, socio-demographic characteristics may play a less pronounced role in shaping seed access patternsThe findings strongly support this. Access to extension training and market information showed a statistically significant association with being an LSB buyer. This confirms that these services, often facilitated through the LSBs' strategic linkages with ABIZARDI and extension agents, were critical in shaping positive perceptions and enabling access. Farmers embedded

in these information networks were more aware of LSB offerings and more convinced of their value. Conversely, the lack of significant association for credit access, despite its high odds ratio in the regression model, suggests a gap between the potential of this support service and its actualized role in shaping perceptions for non-members, likely due to its limited availability.

5.2 Conclusions

In alignment with the study objectives, the findings provide critical insights into the implementation of the LSB model, farmers' perceptions toward it, and the key factors influencing access to quality cassava planting materials. Together, these insights present a comprehensive picture of the overall effect of the model within the study area. Based on the analysis, the following conclusions were drawn for the study.

Objective 1: To analyse the implementation process of the LSB model in enhancing access to quality cassava planting materials

The implementation of the LSB model varies significantly between AMIFA and KFA. AMIFA demonstrates more effective implementation due to consistent access to training, stronger governance, and support from partners, which results in higher technical compliance and improved seed quality assurance, thereby enhancing farmers' access to quality cassava planting materials. In contrast, KFA's limited capacity in training, record-keeping, and quality control constrains its performance and reduces the availability of certified seed to farmers. Although the LSB model is designed to facilitate local access to clean planting materials, its effectiveness depends heavily on internal organization, strategic partnerships, and the ability to meet certification requirements. Therefore, the model's success in improving accessibility is conditional and relies on how well these operational pillars are supported and executed at the local level, particularly in overcoming barriers that limit farmers' access to quality cassava planting materials.

Objective 2: To assess farmers' perceptions of the LSB model as a pathway for accessing quality cassava planting materials

While some farmers hold positive views about the LSB model, this does not always translate into actual seed purchases. Cultural norms surrounding cassava seed exchange, scepticism about seed quality, and perceptions of high costs discourage full engagement with the model. Many farmers still consider the purchase of cassava cuttings unnecessary, especially when informal social networks provide free or familiar alternatives. In addition, inconsistent

adherence to certification protocols weakens trust in the seed supplied by LSBs. Consequently, positive perceptions alone do not lead to widespread adoption, highlighting a clear gap between awareness and actual behavioural change.

Objective 3: To determine the factors influencing farmers' access to quality cassava planting materials through the LSBs

Access to cassava seed is shaped primarily by practical and institutional factors rather than socio-demographic characteristics. Key enablers include access to market information, proximity to the LSB, availability of credit services, and farmers' willingness to replace old seed. At the same time, governance challenges within LSBs and limited distribution channels remain significant barriers. This highlights the importance of strengthening institutional capacity and expanding logistical outreach to improve access to quality cassava cuttings.

5.3 Recommendations

Based on the findings of the study, the following recommendations are proposed to address critical areas for improving the effect of Local Seed Businesses (LSBs) in enhancing access to quality cassava planting materials:

(a) Government, through MAAIF and district agricultural structures, should enhance the technical capacity of LSBs by providing structured training programs in seed production, quality assurance, and marketing, while ensuring affordable inspection and certification services. Government should also strengthen linkages between LSBs, NARO, NGOs, and the private sector to promote farmer awareness through demonstrations and extension campaigns, and to secure reliable distribution networks.

(b) Extension workers should provide continuous technical support to LSBs by guiding them in meeting certification standards, organizing farmer field days, and demonstrating the benefits of quality cassava seed. By serving as the link between farmers and research institutions, extension workers can ensure timely transfer of innovations and practical knowledge, which strengthens LSB capacity to produce quality seed, increase farmer confidence in their products, and expand adoption of certified planting materials.

(c) LSB leaders should strengthen internal governance and accountability by holding regular meetings with documented decisions, establish active committees with clear roles, and maintain transparent financial records accessible to members. They should also invest in continuous training by collaborating with extension workers, NGOs, and

research institutions through workshops on seed production, quality assurance, and marketing. These actions will build member confidence, improve the quality of seed produced, and enhance the competitiveness and trustworthiness of LSBs in the seed market.

Recommendation for further research

The study recommends a controlled experimental study to determine the quality of Local Seed Business planting materials and also test their quality assurance systems, particularly for vegetatively propagated crops like cassava.

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ANNEX I: SURVEY QUESTIONNAIRE

(Non-Participant cassava farmers Category 1 and 2)

My name is Medina Naham, a student pursuing a master of science in Agricultural Extension and Education at Makerere University. One of the requirements for this degree is the final submission of a thesis to the University. In that regard, I am carrying out research to enable me write a thesis. My topic of study is the effect ofthe local seed business model in enhancing farmers' access to quality cassava planting materials inAdjumani and Koboko districts. This study is essential in understanding how the Local Seed Businesses are faring in terms of bringing quality cassava cuttings closer to farmers. You have been selected to take part in this study because of your previous experiences with the LSBs. The decision to participate is completely voluntary. We are committed of handling the information you will give with high level of confidentiality. If you agree to participate in this study, please sign below:

Farmer ……. Data …….

Enumerator: ……Questionnaire No# ……. Date: ……..…. /…..……./…….

Instructions: In questions where responses are provided, circle the appropriate response/s and if need be recording the provided response in the space provided.

Part 1: Demographic Characteristics of the Respondent

Qn.1

Interviewee's name…….……..... Age: … Sex: HH size: ……. Marital status; 1=Unmarried 2=married 3=separated4=widow/er5=others (specify) …….…….…. Level of education: 1=Illiterate 2=primary 3=secondary 4=Diploma 5=degree 6=others (Specify)…….....…… Experience in cassava farming: .....years. Distance to the LSB: District: ……. Village: …..…….

Part 2: Level of income & resource ownership

Qn2. (i) what are your major sources of income? 1= Sale of crops 2=Sale of livestock 3=Sale of livestock products 4=Off-farm income 5=others (specify) ……..…….

(ii). What are your sources of finance for purchase of agricultural inputs? 1=Crop sales 2= Livestock sales 3= Off-farm activities 4= Credit 5=others (specify) ……..……...

(iii). What is your total income from the sale of livestock or livestock products yearly?

Livestock type	**Number owned**	**Annual income from sales**
Cows		
Calves		
Goat		
Sheep		
Poultry		
Livestock products (specify)		
Others specify		

(iv). **Land ownership**

Particulars	**Land holding (ha) Total**	
	Total land	**Cultivated Land**
1.Self owned		
2. Rented		
3. Rented out		
4. Others (specify)		

(v). Do you have any other business other than agriculture that supports your livelihood? 1=Yes 0=No

(vi). If yes, what type of businesses? 1=Petty trading 2=Food processing 3= Sale of fuel wood 4 = Sale of labour 5=others (specify) ……

Part 3: Access to Services

Training

Qn3. (i) What are your sources of l information relating to cassava production? 1= other farmers 2=NGOs 3=DFA 3=NARO 4=Extension agents 5=Radio 6=Agricultural exhibition 7=church/mosque 8=others (specify) …….....…….

(ii). Have you received any training relating to cassava production in the last 3 years? 1=Yes 0=No

(iii). If no, why

……..…….…….

(iv. If yes, how often are the trainings?

……...……...…….……....……...

(v). What areas have you been trained in?

…….…….....

(vi). Where were the training/s conducted from?

……..……...…….

(vii). Who trains/trained you? 1=DFA extension workers 2=LSB farmers 3=NARO extension workers 4=NAADs extension workers 6=others (specify)

……...…...……

(viii). What training methods were used then? 1=Farmer field school 2=farm visits 3=tours 4=demonstrations 5=telephone call 6=others (specify)

…….…….....

Extension service contact

Qn4. (i) Did you have extension contact in relation to cassava production? 1= Yes 0=No

(ii). If yes, how often did the extension agents contact you? 1=Weekly 2= Monthly 3=Twice a year 4= once a year 5=any time when I ask them 6=others (specify)…….….

(iii). If yes, what advice did you receive from the extension agents? 1=Seed selection 2=Land preparation 3= Pests and disease management 4= Harvesting and post-harvest handling 5=others (specify) ……..…….……...……

(iv). Have you ever attended any demonstrations arranged by extension agents relating to cassava production? 1=Yes 0=No

Access to credit

Qn5. (i). Have you ever received formal credit, for cassava production? 1=Yes 2= No

(ii) If yes, what purpose was the credit for? 1=purchase of fertilizer 2=purchase of planting materials 3= purchase of chemicals 4=others (specify) ……..…….

(iii). If yes, what was your source of credit? 1=SACCO 2=Banks 3= Relatives 4=NGO 5=Cream 6=Brac 7=others

(specify)..……...……

(iv). If no, why? 1=No credit suppliers 2= Lack of collateral 3= unfavourable repayment time 4= high interest rates 5= No need (sufficient finance) 6=others

(specify)…….…….

Social participation

Qn6. (i). Are you a member of any local organization, group or institution engaged in the production and dissemination of cassava planting materials? 1=Yes 0=No

(ii). If yes, which organization/group/institution? 1= DFA 2= women's group 3=Cream 4=Farmers group 5=others

(specify)…….……...……

……

(iii). What services are offered by the organization/group/institution you belong to? 1=loans/ credit 2=seeds 3=fertilizer 4=labour 5= training 6= others (specify)…….

Access to markets for purchase of cassava planting materials

Qn7. (i). What is your source of market information on cassava planting materials? 1= traders 2=extension agent 3=DFA 4=LSB 5=other farmers 6=radio 7=others

(specify)…….…….

(ii). Where is your potential market for purchase/or sale of cassava planting materials? 1=Village market 2=LSB 3=RSS 4=DRC 5=others

(specify)……...…….

(iii). How far is the nearest market for purchase/or sale of cassava planting materials?

...……...km

(iv). Are you always aware of the market price before buying any cassava planting materials? 1=Yes 0=No

Part 4: Production pattern and input use

Qn8. Which crops do you grow, how important are they to you and why?

Source and quality of cassava planting materials

Qn9. (i) How many years of experience do you have in cassava production?

..... Years

(ii). Do you usually use quality cassava cuttings at the start of production? 1=Always 2= Sometimes 3=Never 4=No response 5=others (specify)……. …..……...…...

(iii) Explain your answer….....

Qn10. (i). What quality attributes do you look for in cassava planting materials?

Seed quality attributes	1=Most important 2=Important 3=Least important 4=Not important
Yield potential	
Germination	
Seed size	
Physical purity	
Early maturity	
Genetic purity	
Pest tolerance	
Disease resistance	
Marketability	
Drought tolerance	
Local adaptation	
Others (specify)	

(iv). Which cassava varieties do you usually prefer? 1=local only 2= Improved only 3=both local & improved. Why? (If the answer is 2) ……...…… Why? (If the answer is 3) ……...

(v). If the answer is 1, why wouldn't you prefer improved cassava varieties? (Indicate the appropriate response) 1=strongly agree 2= agree 3=neutral 4=disagree 5=strongly disagree

I. Lack of organizations supplying improved varieties in the area ……

II. Lack of awareness about improved seed sources ……...…

III. No yield difference of seeds between local and improved....……...
……

IV. Fear of buying adulterated planting material from the known sources……...……

V. Cuttings for improved varieties are expensive ……...…

VI. Satisfied with local varieties……

VII. Improved varieties are easily affected by diseases…….…….

VIII. Cassava from improved varieties is not palatable … ……..……

IX. Cassava from improved varieties is not marketable … ……..……

X. Improved varieties are not adaptable to our soils ……...……

XI. Others (specify) …….……...……., ...

(vi). Where do you usually obtain quality cassava cuttings for planting from? Specify the varieties, source and means of acquisition, year, yield and whether you are still sowing it.

Variety	How acquired <u>see codes A-J</u>	Sources of Seed <u>See codes 1-10</u>	Yield: 1=Very good 2= Good 3=Average 4=Poor	When (year)	Are you still sowing it? (Yes/No)

Sources of seed: Codes	
1=LSB 2= home-saved/own stocks 3= friends/neighbours/relatives 4= local market 5= NGO 6= GOV'T/NAADs/NARO 7= government 8= agro-input dealer 9= others (specify)	

(vii) Which seed source do you think is the best in meeting your cassava seed needs? 1=Own saved seed 2=LSB 3=NAADs 4=Local market 5=Exchange 6= NARO 7= others (specify).……

Why……?……

(viii). What is your level of satisfaction with these seed sources? explain your answer

Seed source	Level of satisfaction See codes below	Why
Own saved/home stocks		
Exchange/barter		
Local market		
LSB		
Gov't/NAADS/ NARO		
NGO		
Agro-input dealer		
Others (Specify)		

Level of satisfaction: 1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied

Part 5 (Subsection1): Farmers Knowledge about LSBs

Qn12. (i). Have you heard about LSBs before? 1=Yes 2=No

(ii). If yes, what do you know about the LSBs?

……..…….……..…….……

(iii). If yes, how did you get information about the LSBs?

.....….....

(iv). If yes, from who?

……...…….……

(v). If yes, from where?

….……...…….……..

(vi). Are the LSBs doing a good job in popularizing the quality cassava planting materials produced by them? 1=Yes 2=No.

If yes, how would you rate the communication mechanisms utilized by the LSBs in popularization of quality cassava cuttings (Opinions: 1=Excellent 2=Good 3=Average 4=Fair 5=Poor)

The medium of communication…….…….…….……...

Explain ……

The content of the messages…….…….

Explain ……...…….…….……

The methods of communication…….…….

Explain ……...…….

The feedback mechanisms….…….…….……

Explain ……...…

Part 6 (Subsection 2): Farmers' perceptions towards the efficacy of the LSBs

Qn13. (i). Have you ever bought cassava cuttings from the LSBs 1=Yes 2=No?

(ii). If no, why …….

(iii). If yes, at how much did you buy the cuttings from the LSB? ……..sh. per …….....

(iv). If yes, how many times did you buy cassava planting materials from the LSBs? 1=once yearly 2=twice yearly 3=thrice yearly 4=others (specify)

……...……...……

If yes, what motivated you to buy cassava cuttings from the LSBs?

…….……..…….

(v). If yes, what is your opinion about cassava cuttings produced by the LSBs in regards to these statements? (Choose one appropriate response per statement: 1= Strongly agree 2= Agree 3=Neutral 4=Disagree 5=Strongly disagree)

I. The price of LSB cassava cuttings is affordable ……..……...…….……

II. The LSB cassava cuttings have excellent quality……...……...

III. The cuttings are readily available in the required quantities……...……...……...…...

IV. The LSBs make timely deliveries when an order is made...…….

V. The cassava varieties produced by the LSBs are suitable to local conditions …….

VI. The cassava varieties produced by the LSBs yield high…….……..…

VII. The LSB seed sources are nearby…….....

VIII. The LSBs do offer cassava cuttings on Credit…….…….

Access to training through the LSBs

Qn14. (i). Have you received any training through the LSBs? 1=Yes 0=No

(ii). If yes, how often have you been trained ……...…….……...

(iii). In what areas have you been trained in? ……...

(iv). Who trained you……...……?……

(v). Where did you train from (venue/s) …….…...……?

(vi). What training methods were used then?…….……..…….....

Level of satisfaction with cassava planting materials produced by the LSBs

Qn15. (i). Are you satisfied with cassava planting materials produced by the LSBs? 1=Yes 2=No

(ii). What is your level of satisfaction with the LSB cassava cuttings with regard to the access dimensions?

Seed access dimension	Level of satisfaction (See code below)	Explanation
Price		
Quality		
Quantity supplied		
Proximity of the source		
Suitability of the variety		
Profitability of the variety		
Timeliness in delivery		

(Level of satisfaction: 1= Very satisfied 2= Satisfied 3= Dissatisfied 4= No response)

(iii). Do you think the quality of cassava planting materials produced by LSBs is better than cuttings from other sources? 1=Yes 0=No. Explain your answer?……..……

(vi). Do you think that the LSBs' cassava planting materials meet the seed quality attributes?

Seed quality attributes	**Opinion (See codes below)**	**Explanation**
Yield potential		
Germination		
Seed size		
Physical purity		
Early maturity		
Genetic purity		
Pest tolerance		
Disease resistance		
Marketability		
Drought tolerance		
Local adaptation		
Others (specify)		

(Opinion: 1= strongly agree 2= agree 3=neutral 4=disagree 5=strongly disagree)

THANK YOU FOR YOUR TIME!!!!!!!

ANNEX II: FOCUS GROUP DISCUSSION GUIDE

Research Brief

1) Thank you for taking the time to take part in this dialogue about the cassava planting materials accessed through the ISSD support local seed business.

2) By sharing your candid opinions with us, you are contributing to a better understanding of how farmers should be supported to improve their access to planting materials.

3) This discussion will be participatory and interactive way. What you, individually or as a group will not be attributed to individuals and will only be used to accomplish the purpose mentioned earlier. Participation to this discussion is completely voluntary, so you are free to call off/ or stop the discussion at any point you feel uncomfortable.

Guide outline

1. How was this LSB established?

   When did this group start? Is the group registered? What is the composition of members of this group? What were the goals and objectives of its formation?

2. How is this group governed?

   What is the composition of the groups' leadership structure? How functional are the committees? What are the roles and responsibilities of members? How often do you conduct meetings? What are your sources of funds for running LSB activities? Does the group have its own assets? What mechanisms has the LSB put in place for reporting to its members? How are benefits shared among the members? How do the group members resolve conflicts in case there are any? What are the groups' achievements so far? What are the groups' challenges so far?

3. How does the LSB ensure quality seed production and processing?

   What mechanisms have you put in place to ensure quality of the cassava planting materials you produce? Probe on: (source of foundation seed, varietal identification and seed testing, exposure to internal and external training; access to and use of production guidelines; use of modern techniques, access to and use of yield enhancing inputs, soil fertility and water management, Internal procedures, quality control and monitoring committees, minimum quality standards)

4. What seed storage facilities are in place?
   Which knowledge and skills do the LSB members possess in regard to a) processing b) packaging and C) storage of cassava planting materials?

5. Who is the target clientele of the LSBs cassava planting materials?
   What strategies are employed by the LSBs to ensure access to quality cassava cuttings by the communities? (probe on markets; price; promotional campaigns; feedback; demand forecasting; monitoring)

6. How do the LSBs receive and disseminate information on quality cassava planting materials?
   What is usually the content of those messages? Who trains the LSBs in quality seed production?
   Where is the training conducted from? How is the training conducted? (probe on the content of training and frequency of training).

7. Who are the major stakeholders or actors in the LSB activities and what are their roles?
   Do members of this LSB also belong to other groups within/outside the community? What are the benefits of belonging to those other groups? What are their roles in those groups?

8. How involved are the LSBs in social networks within and outside the community?

9. What aspects of the LSB model have facilitated access to good quality cassava planting materials?

   How do these aspects facilitate access to good quality cassava cuttings? (Probe on: Seed quality, quantity, deliverability, information dissemination, price, marketing strategies, extension and training, group cohesion and availability of resources).

10. What aspects of the LSBs' model have hindered access to good quality cassava planting materials?

How do these aspects hinder access to good quality cassava cuttings? (Probe on: Seed quality, quantity, deliverability, information dissemination activities, price, marketing strategies, extension and training, group cohesion, resources).

THANK YOU FOR YOUR TIME!!!!!!!