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‘We Are Many Using the Same Land’: Perceived Challenges to Smallholder Agriculture and Implications for Household Food Security and Nutrition in Two Districts of the North and Southwest Regions of Uganda

March 2014

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This report is made possible by the generous support of the American people through the support of the Office of Health, Infectious Diseases, and Nutrition, Bureau for Global Health, U.S. Agency for International Development (USAID) and USAID/Uganda, under terms of Cooperative Agreement No. AID-OAA-A-12-00005, through the Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360.

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Recommended Citation

Sethuraman, K.; Glaeser, L.M.; and Okello, E. 2014. *'We Are Many Using the Same Land': Perceived Challenges to Smallholder Agriculture and Implications for Household Food Security and Nutrition in Two Districts of the North and Southwest Regions of Uganda*. Washington, DC: FHI 360.

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Acknowledgements

The authors would like to acknowledge and thank the data collectors and study participants in Uganda's Kabale and Amuru districts. Without their participation, this research would not have been possible. The authors also extend their gratitude to the reviewers who provided invaluable feedback in the finalisation of this document.

Contents

Acknowledgements	i
Abbreviations and Acronyms	iii
Executive Summary	1
1. Background	4
1.1 Study Purpose and Introduction	4
1.2 Developing a Conceptual Framework	6
1.3 Organisation of the Paper	7
1.4 Definitions of Key Terms	8
2. Methodology	10
2.1 Study Areas	10
2.2 Study Objectives	11
2.3 Study Design and Sampling Methods	12
2.4 Ethical Considerations	14
2.5 Data Analysis	14
2.6 Limitations to the Interpretation of the Study Findings	14
3. Findings.....	16
3.1 Underlying Issues Affecting Food Access.....	16
3.2 Proximate Factors Influencing Food Access.....	19
3.3 Food Access and the Household Food Basket	30
4. Discussion and Recommendations.....	32
4.1 Main Study Conclusions	32
4.2 Implications of Findings for Programming and Recommendations	33
4.3 Recommendations Regarding Topics for Further Study.....	36
References.....	37

Figures and Tables

Figure 1. Dynamics Affecting the Household Food Basket and Nutrition Outcomes in Uganda	7
Figure 2. Map of Study Districts and Regions in Uganda	10
Table 1. Data Sources by Data Collection Location and Method.....	13
Table 2. Underlying Issues Study Informants Identified as Affecting Food Access	16
Table 3. Distinguishing Features in Reported Proximate Factors Influencing Food Access in Amuru and Kabale Districts	19
Table 4. Agricultural Production Limitations in the Study Areas in Uganda.....	20
Table 5. Reported Size of Land Holdings, in Acres, in Uganda’s Amuru and Kabale Districts	21
Table 6. Reported Typical Sources of Income in the Study Areas	27

Abbreviations and Acronyms

FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization of the United Nations
FEWS NET	Famine Early Warning Systems Network
IFPRI	International Food Policy Research Institute
kcal	kilocalorie(s)
km	kilometre(s)
km ²	square kilometre(s)
LRA	Lord's Resistance Army
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MFPED	Ministry of Finance, Planning and Economic Development
mm	millimetre(s)
n.d.	no date
USAID	U.S. Agency for International Development

Executive Summary

Recent national surveys have established the extent of chronic and acute malnutrition and food insecurity across Uganda. However, available evidence allows for only a limited understanding of the household-level dynamics between smallholder agriculture, food security, and nutrition outcomes. For example, little evidence is available regarding whether/how the decreasing availability of land for household farming is affecting households' ability to achieve food security—and the resulting effects on nutrition outcomes. Better understanding of these household-level dynamics is critical to understanding how best to leverage agriculture to improve nutrition outcomes in this context.

This report presents findings from a qualitative research study that was undertaken by the U.S. Agency for International Development (USAID)-funded Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360. The objectives of this study were to:

- Understand the dynamics of smallholder agricultural production and its challenges as perceived by study participants—smallholder farmers in Uganda's Amuru and Kabale districts—as well as the implications of these challenges on household food security and the food-related factors that influence nutrition.
- To the extent practicable, use study findings to identify programme and policy recommendations for the study areas, and specify where additional research is required to build on the evidence base from which stakeholders implementing programmes in these areas can draw when designing, monitoring, and evaluating interventions.

The study was undertaken in two districts in Uganda: Amuru district in the North region and Kabale district in the Southwest region. The study used qualitative methods and included interviews with 31 household farmers with children under 2 years of age and 5 community leaders and elders. Data collection was completed in August 2012.

The study findings indicate that the relationship between agriculture, food security, and nutrition in Amuru and Kabale districts is complex and changing in important but somewhat different ways. Overall, the data show that the study participants in both districts face challenges at every level that adversely affect their food access (in terms of food production and purchasing power) and, ultimately, food utilisation/consumption (in terms of the diversity of the household food basket, and the time and other resources available for daily food preparation). While many of the constraints to agricultural production that men and women reported in this study—such as challenges related to land access; land quality; lack of necessary resources, including time; and climate variability—are not unique, the routine co-occurrence of so many of them in the study areas ultimately undermines households' ability to achieve food security and good nutrition.

Implications of Study Findings for Programming and Recommendations

Study findings indicate that a range of intersectoral efforts is needed to enable households in the study areas to meet their food security and nutrition needs. The findings also suggest that the strategies to meet these needs will be somewhat different in each district. Key implications of the study findings and related recommendations for the two study districts follow.

Improving Household Food Security and Nutrition: District-Specific Considerations

In Amuru district, most households remain dependent on agriculture to meet their food needs. The population in Amuru district is less dense than in Kabale, and land for farming remains relatively more available and arable. Undertaking daily wage labour or other income-generating activities is a strategy typically employed only in times of food shortage, or when an unexpected need for additional income arises. The study findings indicate that greater investment in improved farming technologies is likely to have a significant impact (the potential for higher yields) on food access and food-related

aspects of utilisation/consumption in Amuru district. Providing men and women with additional stable income sources and/or subsidies to access capital, inputs, tractors, oxen, other technology, and transportation will assist farmers in optimising production from their land and addressing key food access issues that affect food utilisation/consumption.

In contrast, in Kabale district, while men and women aspire to be farmers, many are no longer able to access enough land on which to subsist, and must engage in other income-earning opportunities. As such, different approaches will be needed to improve household food access to optimise food consumption/utilisation and assist in improving nutrition in this district. That is, while some investment in improved farming practices to increase agricultural production in Kabale district might be useful, in isolation it will bring very little benefit to most families, given the extent of land scarcity and the inability of households to acquire more land. As a result, a regional approach to increase and expand employment, training, and skills-building opportunities will be essential in this area.

An interesting finding in both districts is that study informants referred to accessing land in terms of 'individual' ownership, purchasing, or renting. This trend is a shift from past practices of communally holding land, and informants in this study did not acknowledge the potential role of the community in maintaining land for farming. Given the increasing scarcity of land quality and quantity across Uganda and, in particular for this study, in Kabale district, promoting community social networks to protect and promote land management practices may also assist in protecting and promoting household food security.

Recommendations Specific to Kabale District

- Expand access to off-farm income-earning opportunities that also meaningfully consider the division of labour within the household and women's time constraints and that provide women and men with equal pay.
- Provide training and skills-building opportunities to men and women to help them become engaged actors in their local economy beyond their agricultural contributions.

Recommendations Specific to Amuru District

- Expand access to subsidised farming inputs, such as capital, technology, livestock, and transportation.
- Expand use of improved farming methods and technologies.
- Ensure that interventions meaningfully consider the division of labour within the household and, in particular, women's time constraints.

Improving Food Access in Terms of Production and Purchase: Broad Findings

Among farmers who have access to larger tracts of land (particularly those in Amuru district), there is a need for investment in improved farming practices (e.g., ploughing using animal traction or tractors, increased access to/use of improved seed varieties). This investment should, in tandem, incorporate natural resource management practices to mitigate the impacts of climate variability and population growth on farm yields, as climate variability and decreasing soil fertility undermined crop yields in both study areas. Additional stable income-generating activities or subsidised access to farming capital to allow for improved access to necessary inputs is also needed.

Among farmers with access to little or no land in both districts, there is a need for stable alternative income-earning opportunities that permit these populations to regularly earn a living wage to be able to meet household food security needs.

As the district-specific recommendations imply, policy guidance and interventions are also needed to ensure employment opportunities and fair wages for both men and women, particularly in Kabale district, where casual on- and off-farm labour is more common. At the national level, it is important to

identify policy and programmatic approaches to reduce the impact of high retail food prices in the study areas (e.g., by promoting natural resource management). Greater investment is also needed to expand access to family planning services in both districts, as the study findings show that population growth is adversely affecting household food security and nutrition.

Recommendations to Improve Food Production and Purchase

- Expand access to family planning services.
- Create an enabling policy and programme environment that mitigates and protects against the effects of climate change (e.g., introduction of crop insurance mechanisms, continued development and enhanced distribution of improved seed varieties) and promotes natural resource management (e.g., encouraging composting and/or other practices to retain topsoil and naturally enhance soil fertility).
- Invest in and disseminate farming technologies that improve crop yields and protect the environment to mitigate against the impacts of increasing climate variability (e.g., encourage use of shorter-cycle crops, rain catchments, terracing).
- Improve soil fertility, for example, by subsidising access to key inputs, such as fertilisers, or encouraging composting.
- Increase efforts to comprehensively train men and women farmers in improved farming and post-harvest methods.
- Expand access to safe and secure post-harvest storage options.
- Provide men and women farmers with increased access to farming resources, including capital, technology, transportation, improved seeds, and other inputs.

Improving the Household Food Basket

In addition to the need to increase the amount of food and income available from production and to stabilise the availability of income from other sources, the most significant need related directly to the household food basket is development of and support for the use of labour-saving technologies to free up women's time to prepare diverse foods for their families. In both districts, women's lack of time was a major constraint for food preparation and other household and child care activities. Some investment is also required to provide women and their families with the convenience of accessing diverse, high-quality, ready-to-use complementary foods to support women's efforts to feed children under 2 years of age frequently enough to meet dietary requirements of food quantity and diversity. Investment is also needed to improve access to alternative fuel sources and safe water to reduce women's time burden in their daily search for these inputs.

Recommendations to Improve the Household Food Basket

- Invest in labour-saving technologies for women and identify other ways to free up women's time so that they are able to provide optimal child care and dedicate adequate time for food preparation (for example, expand access and use of fuel-efficient, environment-friendly cook stoves; encourage development of small-scale cooperatives that assemble and market at accessible prices key elements needed to prepare evening meals, such as meal ingredients, firewood, and potable water, to save women time in searching for these elements).
- Invest in strategies to increase access to alternative fuel and safe water sources.
- Identify and invest in approaches to prepare and make available at low cost locally prepared complementary foods that are nutrient dense to meet the needs of children 6–24 months.
- Promote male involvement in supporting maternal and child nutrition.

1. Background

1.1 Study Purpose and Introduction

Recent national surveys have established the extent of chronic and acute malnutrition and food insecurity across Uganda. However, available evidence allows for only a limited understanding of the household-level dynamics between smallholder agriculture, food security, and nutrition outcomes. For example, little evidence is available regarding whether/how the decreasing availability of land for household farming is affecting households' ability to achieve food security—and the resulting effects on nutrition outcomes. Better understanding of these household-level dynamics is critical to understanding how best to leverage agriculture to improve nutrition outcomes in this context.

This report presents findings from a qualitative research study that was undertaken by the U.S. Agency for International Development (USAID)-funded Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360. The study was undertaken in two districts in Uganda: Amuru district in the North region and Kabale district in the Southwest region. These two districts were selected to compare smallholder farming household experiences in areas where agriculture is a main livelihoods strategy and where data indicate persistent high levels of chronic malnutrition¹, relative to other parts of the country. As such, the study findings provide a bird's-eye view of current farming practices and challenges households face with regard to smallholder agriculture, as perceived by the study participants. The study findings also shed light on the implications of farming challenges on household food security and nutrition in these study areas. Because recent evidence exists on the nutrition and food security situation in Uganda, this study did not seek to directly measure food security and nutrition outcomes, but rather focused on gaining a better understanding of the household dynamics that affect agriculture and the implication of these dynamics for food security and nutrition.

1.1.1 Nutrition and Broader Development Contexts in Uganda

Recent trends in several key development indicators for Uganda indicate overall improvement, including:

- A reduction in national poverty levels from 56 percent in 1992/93 to 24 percent in 2009/10 (Uganda Ministry of Finance, Planning and Economic Development [MFPED] 2012).
- An increase in real growth² in agricultural output of 1.3 percent in 2007/08 and 2.6 percent in 2008/09 (Uganda Ministry of Agriculture, Animal Industry and Fisheries [MAAIF] 2010), which is significant given that agriculture is one of the primary engines of the country's and its households' economies.
- A reduction in the national prevalence of stunting, a measure of chronic malnutrition, from 38 percent in 2006 to 33 percent in 2011 (Uganda Bureau of Statistics and ICF International 2012).

While the 2011 Uganda Demographic and Health Survey shows improvement (reduction) in overall national and some regional levels of chronic malnutrition compared to the 2006 survey, it also reveals significant variation in malnutrition prevalence between regions. In 2006, the prevalence of chronic malnutrition was highest in the country's Southwest and North regions, at 50 percent and 40 percent, respectively (Uganda Bureau of Statistics and Macro International 2007). In 2011, the prevalence of

¹ Available data indicate that since the initial design of this study the reported chronic malnutrition prevalence has decreased significantly in the North region relative to the Southwest region—likely due in part to the cessation of civil conflict in the North region.

² Growth in agricultural output is often measured in monetary units. 'Real growth' reflects adjustments to these monetary units for currency differences and inflation. Therefore, real growth is a result of actual expansion of a given sector's output, rather than fluctuations in the value of the country's currency.

chronic malnutrition had decreased in these areas to just under 25 percent in the North region (ranking it 9th highest for chronic malnutrition among the country's 10 regions), but to only 42 percent in the Southwest region (ranking it 3rd highest) (Uganda Bureau of Statistics and ICF International 2012).

Similar variable progress is evident across many of Uganda's other development indicators. For example, while overall poverty levels in Uganda have decreased in the past two decades, the trend has not been consistent, with levels falling from 56 percent in 1992 to 34 percent in 1999, rising to 38 percent in 2002, falling to 31 percent in 2005, and then to 24 percent in 2009 (MAAIF 2010). This variability in poverty levels mirrors trends in the country's agriculture sector. According to limited available data, agriculture grew at an average rate of 3.8 percent from 1987 to 2005, but growth in the sector declined from 7.9 percent in 2000/01 to 0.1 percent in 2006/07, before increasing to 1.3 percent in 2007/08 and 2.6 percent in 2008/09 (MAAIF 2010). In addition, while the Government of Uganda adopted a multisectoral approach to address nutrition issues in its 2011 Uganda Nutrition Action Plan, and aggregate levels of chronic malnutrition have decreased, micronutrient deficiencies—especially vitamin A deficiency, iron-deficiency anaemia, and zinc deficiency—remain high (Uganda Bureau of Statistics and ICF International 2012). Although average per capita caloric intake has improved from 1,494 kcal in 1992 to 1,971 kcal in 2005 (MAAIF 2010), this progress still falls short of the minimum intake of 2,200 kcal recommended by the Food and Agriculture Organization of the United Nations (FAO). What is more, levels of chronic malnutrition have increased in some regions, including in the Western region (from 37.6 percent in 2006 to 43.9 percent in 2011) and in the Central 2 region (from 29.8 percent in 2006 to 36.1 percent in 2011) (Uganda Bureau of Statistics and ICF International 2012). As a result, today, even with the aggregate gains the country has made in reducing chronic malnutrition, one in three children is stunted (MAAIF 2010). Finally, despite overall decreases in the prevalence of poverty and chronic malnutrition, and increases in agricultural production, the proportion of food-insecure people in Uganda increased from 59 percent in 1999/2000 to 63 percent in 2002/03 and 66 percent in 2005/06 (*ibid.*). Although more than 73 percent of households in Uganda depend on agriculture for their principal livelihood (*ibid.*), the increasing number of Ugandans who are food-insecure suggests that smallholder agriculture—the type of agriculture most populations in Uganda practise—is no longer sufficient to subsist on and other income sources are needed to reduce food insecurity.

The variable progress in many of these development indicators is due to several factors, including the country's population growth. At 3.2 percent, Uganda's population growth rate is the third highest in the world, outpacing the country's rate of agricultural growth. Uganda's population has increased nearly fivefold since 1969, and is currently estimated at nearly 36 million (Index Mundi 2013), with forecasts indicating it is likely to grow to 62–89 million by 2037 (MAAIF 2010). Even with more conservative population growth estimates, the country must now, at a minimum, feed an additional 1 million people every year. The Government of Uganda has prioritised population control, but the country's total fertility rate remains high, at 6.2 children per woman (Uganda Bureau of Statistics and ICF International 2012). The unmet need for contraception is estimated at 34 percent (*ibid.*), indicating a demand for expanded family planning services. Also significant in an environment with a high population growth rate and heavy reliance on agriculture as a principal livelihood are the gender dimensions of agriculture and the resulting impact on food security and nutrition outcomes, as women smallholder farmers in Uganda struggle to balance their time between child-rearing, farming, and other tasks. These competing priorities often adversely affect the nutrition of young child, as mothers do not have adequate time to provide optimal care.

Uganda's Agriculture Sector Development Strategy and Investment Plan (MAAIF 2010) indicates that, in addition to population growth, the main threats to the agriculture sector include: climate change, degradation of land and other natural resources, and inadequate access to and use of improved farming practices and inputs. The plan notes topsoil losses from land degradation of up to 5 tons per

hectare in some areas and forecasts temperature increases—up to 1.5 degrees Celsius over the next 20 years, and 4.3 degrees Celsius over the next 70 years—with more frequent climatic events, including intense rainfall, heat waves, droughts, floods, and storms.

Even with improvements in agricultural growth, existing literature indicates that adequate aggregate food availability at the national and/or household levels does not necessarily translate into improved nutrition outcomes, in part because availability of food does not necessarily translate directly into access for all, and in part because what is accessible is not necessarily of adequate nutritional quality. Patrick Diskin (1995) lists numerous studies that show that an adequate supply of food at the national level does not guarantee against hunger (Jayne and Chisvo 1991; Kennedy and Haddad 1992; Sarma and Gandhi 1990; Sen 1981). The World Bank further observes, ‘It is common to have 20 to 30 percent of a country’s population consuming less than 80 percent of caloric requirements even though national-level food availability is at or greater than 100 percent’ (Kennedy and Bouis 1993, cited in Diskin 1995). Amartya Sen (1981) aptly captures this complexity, noting that starvation is a matter of some people not having enough food to eat, and not a matter of there being not enough food to eat.

Therefore, at the household level, food access is an important factor in understanding overall food security and nutritional status. Ugandan households in the study areas access food through their own food production and through purchase from local markets or acquisition by other methods, such as bartering. As such, understanding the dynamics between agriculture and income at the household level in these areas is important for interpreting nutritional outcomes. Indeed, an International Food Policy Research Institute (IFPRI) study (Ulimwengu and Ramadan 2009) indicates that only 12 percent of households in Uganda are significant net sellers of agricultural produce and that 66 percent are instead net buyers of this produce, relying on markets for more than a quarter of the value of the foods they consume. Even in rural areas, more than 60 percent of households were found to purchase more food, by value, than they sell (MAAIF 2010).

The literature also indicates a complex relationship between income growth and nutrition outcomes. Evidence indicates that increases in household incomes do translate into some improvement in nutrition outcomes, though this improvement is tempered by a number of factors, including fluctuations in food prices and who within the household earns and manages the increased income (Haddad et al. 2002; Schuftan 1998; Bouis et al. 2011). In addition, increases in income alone are likely to be inadequate to address the spectrum of factors influencing nutrition outcomes (e.g., health, hygiene, knowledge of optimal feeding practices). For households to be food secure, food availability, food access, and food utilisation/consumption must be present and functional at both the aggregate and household levels. As Diskin (1995) describes, ‘Having enough food available at national and local levels is necessary but not sufficient for ensuring households have adequate access to food; having adequate household access to food is necessary but not sufficient for ensuring that all household members consume an adequate diet; and consuming an adequate diet is necessary but not sufficient for maintaining a healthy nutritional status’.

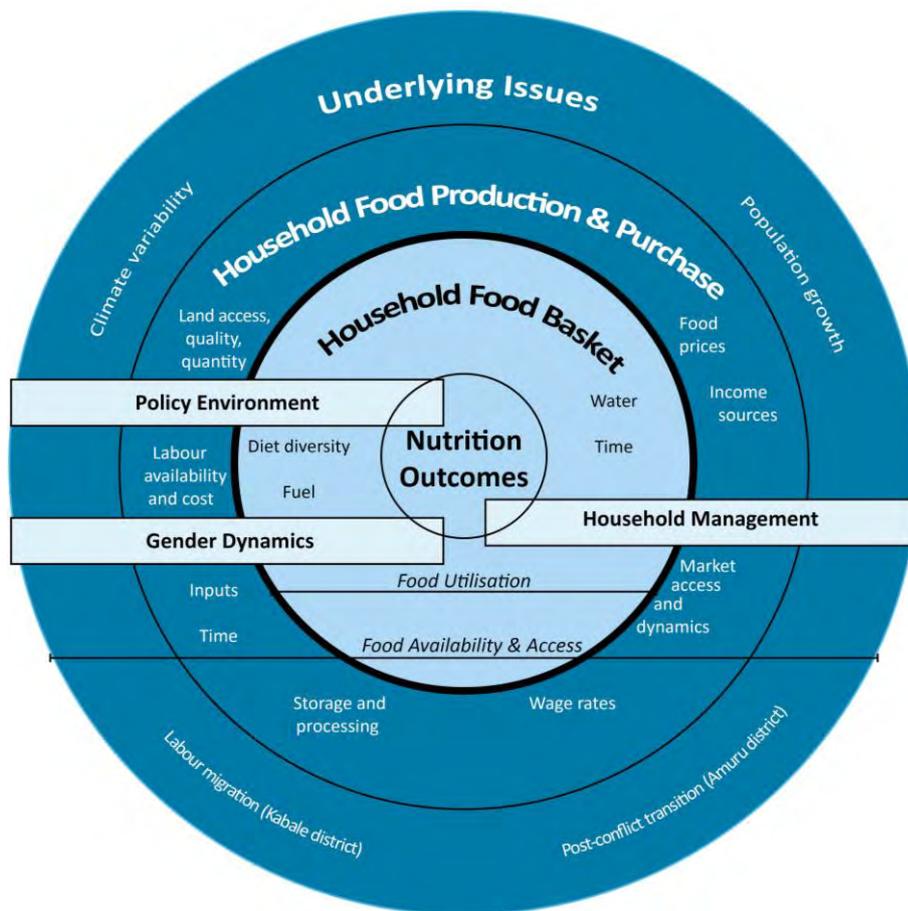
1.2 Developing a Conceptual Framework

To contextualise and explain linkages between agriculture and nutrition outcomes at the household level in Uganda, FANTA developed a conceptual framework, which was tested and proved accurate during this study (see **Figure 1**).

Optimal nutrition outcomes—the innermost circle of Figure 1—are only possible given: 1) household access to an adequate (in quantity and quality) food basket and 2) availability of and household access to non-agriculture-specific necessities (e.g., clean water, fuel, and time to prepare a diverse meal, as well as other factors not considered in this study, such as adequate health care and knowledge of appropriate practices related to child care and hygiene), which are captured in the ‘Household Food Basket’ circle. As the focus of this study is on the interplay between agriculture and nutrition, the analysis pays particular attention to the ‘upstream’ dynamics—the two outer concentric circles of the

framework—affecting the household food basket and overall nutrition outcomes, namely food access (i.e., household food production and purchase) and underlying issues affecting food access. Put in context, access to an adequate food basket depends on a household being able to produce and/or procure enough diverse foods from the market (e.g., by purchasing) or through other means (e.g., bartering, gifts, assistance) to meet its needs. In turn, production of diverse foods is influenced by broader issues, such as population growth; land access, security of tenure, and quality; climate variability; and access to production inputs (e.g., time, labour, traction, seeds, fertiliser, tools, and pesticides). Similarly, access to diverse foods through market purchase is influenced by market infrastructure and integration and available incomes, which are in turn affected by such factors as agricultural production levels, labour opportunities (including migratory labour), wage rates, and retail prices for market goods. In addition, factors such as the policy environment, gender dynamics, and household management affect and are affected by each circle of the framework.

Figure 1. Dynamics Affecting the Household Food Basket and Nutrition Outcomes in Uganda



A key characteristic of this conceptual framework is its emphasis on food access as a vital factor influencing nutrition outcomes at the household level. This conceptual framework posits, and the findings from this study confirm, that an exploration of the linkages between agriculture and nutrition outcomes must include not only an exploration of the foods households grow and consume (the two inner circles of the framework), but also an exploration of factors influencing what households grow and how they obtain the rest of what they consume (the two outer circles).

‘Food security’ is defined as existing when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life (USAID 1992). The food security community broadly understands *households* to be food secure when ‘they have

year-round access to the amount and variety of safe foods their members need to lead active and healthy lives' (FAO 2010). Diskin (1995) further states, 'Having food available at national, or even local, levels is of little value unless households have access to it. Furthermore, the ability of households to access food is of little importance unless it leads to increased (or more stable) food intake (in the short and long run)'. Therefore, to understand the dynamics of food security at the household level, and the links between agriculture and nutrition within these dynamics, food access is of particular importance.

1.3 Organisation of the Paper

This paper presents the findings of an analysis of the dynamics of household agricultural production as perceived by the study participants and the impact of these dynamics on household food security and nutrition outcomes. The first section provides an overview of the methodology employed to collect and analyse the study data. The second section presents key findings of the formative research. The third section discusses the main implications of these findings and provides recommendations for stakeholders to consider to address food production constraints and optimise household food security and nutrition outcomes in future programming. The third section also outlines potential topics of additional study that may further illuminate the linkages between agricultural production and nutrition outcomes in this context.

1.4 Definitions of Key Terms

The following definitions of key terms are specific to the study context and have been included for clarity.

Climate variability. Reported perceptions that 'typical' climate cycles (in the case of this study, cycles associated with agricultural production seasons, such as the rainy and dry seasons) were increasingly marred by 'atypical' occurrences (e.g., early or late onset of rains, less predictable periods of rain and dryness across the production and post-production season).

Food security. Food security is the state that exists when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life (USAID 1992). Food security is composed of several key pillars, including food availability, food access, food utilisation/consumption, and the persistence of each of these (sometimes referred to as a fourth pillar, food stability).

Food access. One of the three main pillars of food security, food access facilitates food security when a given population consistently has adequate income or other resources necessary to purchase or barter to obtain the levels of appropriate food needed to maintain consumption of an adequate diet and/or an adequate level of nutrition (USAID 1992). This study focuses in particular on this pillar as a main means by which household agricultural production links to individual nutrition outcomes.

Food availability. One of the three main pillars of food security, food availability facilitates food security when sufficient quantities of appropriate, necessary types of food from domestic production, commercial imports, or social assistance are consistently available to a given population, are in reasonable proximity to them, or are within their reach (USAID 1992). While food availability is an important component for understanding aggregate food security, this pillar is not a particular focus of this study, which delves instead into household dynamics regarding how people access the foods they ultimately consume.

Food utilisation/consumption. One of the three main pillars of food security, food utilisation/consumption facilitates food security when food is consistently properly used within a given population, including through proper processing and storage techniques and through the demonstration of adequate knowledge and application of appropriate nutrition and child care

techniques, and when adequate health and sanitation services are available and accessible to that population (USAID 1992). This study looked particularly at the diversity of the household food basket, the time and other resources available for daily food preparation, and the contribution of these factors to optimal nutrition within the household. This study did not explore the non-food factors that influence nutrition outcomes, such as sanitation, care practices, and availability of and access to health care and other social services.

Food basket. The quality and quantity of food required to meet dietary needs (e.g., sufficient energy and nutrition) for a healthy and productive life. In addition to the availability of resources to access this food basket, availability of time and availability of and access to key inputs, such as fuel and potable water, are also necessary for households to derive maximum benefit from this basket.

2. Methodology

2.1 Study Areas

FANTA conducted this research in one sub-county in each of Uganda's Amuru and Kabale districts, located in the country's North and Southwest regions, respectively (see **Figure 2**).

Figure 2. Map of Study Districts and Regions in Uganda



Amuru district is predominantly rural. Previously part of Gulu district, the Ugandan Parliament established Amuru as a separate district in 2006. Amuru, together with Agago, Gulu, Kitgum, Lamwo, Nwoya, and Pader districts, form the Acholi sub-region. Amuru had two counties and eight sub-counties at the time of data collection, and a population of about 174,000 people in 2011 (Uganda Communications Commission 2010). Amuru district is relatively flat and fertile, with an extensive feeder road network, but no tarmac road (Muyomba-Tamale et al. 2010). This poses transportation challenges, particularly given increasing volumes of truck traffic to and from the South Sudan border. Amuru and Kabale districts share a similar production calendar, with two dry seasons (December through February and June/July through August) and two rainy seasons (March through May/June and August/September through November) (Famine Early Warning Systems Network [FEWS NET] 2013). Mean annual rainfall in Amuru district is 100–140 mm (Government of Uganda 2007), and the mean annual temperature is about 25 degrees Celsius (Kimbla-Mantana Uganda 2008). Data collection for this study was undertaken in Gaya Parish, Pabbo Sub-county.

Kabale district is situated in the southwestern corner of Uganda. At the time of data collection, the district had four counties and 26 sub-counties, with a population of about 597,600 people in 2011 (USAID/Uganda 2012). Mean annual rainfall in Kabale district is 80–120 mm (Government of Uganda 2007), and the mean annual temperature is about 16 degrees Celsius (Kimbla-Mantana Uganda 2008). Kabale district is hilly, with mountainous slopes in the extreme Southwest that gradually diminish to the north and east. This topography presents unique challenges. Because of the hills, farming is typically done using a traditional hoe, which limits production capacity. In addition, given increasing population density and related limited land access and natural resource degradation, the hillsides in this area are prone to soil erosion, limiting their fertility (USAID/Uganda 2012). Data collection for this study was conducted in Ntarabana Parish, Buhara Sub-county.

While the dominant economic activity in both study areas is agriculture, the communities in each district are culturally distinct, and their production contexts differ in important ways. For example, following the end of a prolonged conflict³, the North region (including Amuru district) has focused on reconstructing its economy, including its agricultural sector. The Southwest region (including Kabale district), which has traditionally been one of the country's breadbaskets, has been more geopolitically stable.

In Kabale district, dominant food crops include sweet potatoes, Irish potatoes, plantain/green banana (*matoke*), sorghum, millet, and maize, and in Amuru district, sorghum, millet, and maize. Pulses grown in both areas include groundnuts, sesame seeds, cowpeas, green gram, and various beans. Vegetables common across the study areas include tomatoes, cabbage, onions, eggplants, okra, and greens (fresh and dried) such as kale and collards. The main tubers include cassava and sweet potatoes. Households in these districts also engage in cash crop production, in particular, rice in Amuru district and sorghum and potatoes in Kabale district.

Uganda's North and Southwest regions were specifically selected for this study because when study planning began, they possessed the highest chronic malnutrition rates in the country, at 49.6 percent in the Southwest and 40.0 percent in the North (Uganda Bureau of Statistics and Macro International 2007). More recent data released while this study was under way indicate that these regions now rank third (Southwest region, 41.7 percent) and ninth (North region, 24.7 percent) highest for stunting among the country's 10 regions (Uganda Bureau of Statistics and ICF International 2012). Nevertheless, the authors believe the study findings remain relevant for future agriculture, food security, and nutrition programming in these areas. In particular, the data collected in both regions suggest that increases in levels of chronic malnutrition are possible if current agricultural trends and challenges are not addressed.

2.2 Study Objectives

The objectives of this study were to:

- Understand the dynamics of smallholder agricultural production and its challenges as perceived by study participants—smallholder farmers in Uganda's Amuru and Kabale districts—as well as the implications of these challenges on household food security and the food-related factors that influence nutrition.
- To the extent practicable, use study findings to identify programme and policy recommendations for the study areas, and specify where additional research is required to build on the evidence base from which stakeholders implementing programmes in these areas can draw when designing, monitoring, and evaluating interventions.

To achieve these objectives, the study explores several topics, including:

- Population dynamics, climate variability, and the implications of each on land access, ownership, and food production
- Additional factors influencing food production and purchase
- Implications of these factors for household food security and the household food basket

While the link between the household food basket and optimum nutrition outcomes is direct and an important consideration in any concerted effort to improve nutrition, this report focuses on other

³ Civil unrest that began in northern Uganda in the 1980s intensified through the 1990s and early 2000s, leading to the displacement of more than 1 million people from the country's northern regions. While the conflict effectively ended in late 2008 with a joint military offensive against the Lord's Resistance Army (LRA) in the Democratic Republic of Congo, the LRA reportedly remains active in parts of the sub-region. For additional information on this conflict, see <http://www.globalsecurity.org/military/world/war/uganda.htm>.

important meta-dynamics, or ‘upstream’ factors and linkages, that affect the composition of the food basket—in particular, food access—and ultimately influence households’ food security.

The focus on upstream factors affecting household agricultural production and food security broadly, and nutrition outcomes in particular, means that the study design did not include a focus on such factors as dietary knowledge, child care practices, or availability of and access to health care among households in the study areas. The study also did not assess current nutritional status in the study areas. Instead, the study worked to understand key constraints to accessing an adequate household diet in terms of quantity and quality. FANTA took this study approach, in part, because knowledge of what one needs to do to have an adequate and balanced diet, in and of itself, is not sufficient if the conditions are not conducive for household food access and, more broadly, household food security. Rather, a convergence of knowledge, resources, and agency are needed to achieve household food security and optimal diets (Sethuraman et al. 2006). Given the lack of understanding of household-level challenges with regard to agriculture and food security, the authors felt that it was more important to contextualise the links between agriculture and household nutrition outcomes within the broader food security environment in which the study populations live. Given this approach, the findings from this study might also help guide the design of subsequent studies that use quantitative or other qualitative methods to measure the links or pathways between agriculture and nutrition.

2.3 Study Design and Sampling Methods

Food security and in particular food access are well-documented, significant problems in both study regions. But why these challenges exist and how they are manifest at the household level is less well understood. Answering this type of question is beyond the scope of quantitative study and instead calls for more ethnographic methods to gain a better understanding of nuances, perceived relationships, and causalities. Therefore, to achieve the study objectives and elucidate the relationships between agriculture and nutrition at the household level, the study employed qualitative data collection methods. These methods produced findings about challenges households faced and households’ perceptions about why they were facing them.

The study began by reviewing literature pertinent to agriculture, food security, and nutrition in Uganda and, to the extent possible, in each of the selected study areas. This review informed the structure and content of the data collection portion of the study. For data collection, convenience and purposive sampling methods were used to select study participants. Standard sampling methods in qualitative research, these approaches are often used in studies for which a goal is to describe social phenomena and household practices. These sampling methods do not generate statistically representative or generalizable results. Rather, they are used on the premise that study questions seek to understand current practices that certain households are likely to have first-hand knowledge of and experience with.

Inclusion criteria for study participants were that they be community leaders (key informants) or male and female rural farmers from households with children under 2 years of age. Male and female rural farmers were selected because they have knowledge of and experience with current agricultural practices and the dynamics and challenges associated with them. From within this population, men and women with children under 2 years of age were specifically selected because they have current knowledge of and experience with meeting the nutritional needs of young children and the associated challenges.

2.3.1 Data Collection

Methods of data collection included unstructured key informant interviews with community leaders and semi-structured interviews with farmer parents of children under 2 years of age. FANTA developed a semi-structured interview guide to obtain information from father and mother farmers in both regions to better understand current agricultural practices, broad food security dynamics, and

related nutrition constraints at the community and household levels. The interview guide focused on land access and ownership, food production and post-harvest management, income-generating activities, gender issues, food security, and dietary issues and constraints. Unstructured interviews with key informants focused on land access and ownership, changes in these dynamics over time, and constraints to farming. All qualitative data analysed in this study were collected in August 2012.

Table 1 presents the study sample and data collection methods.

Table 1. Data Sources by Data Collection Location and Method

Location and method	Informant type		
	Key informants	Fathers of children < 2 years of age	Mothers of children < 2 years of age
Amuru district			
Unstructured interview	3		
Semi-structured interview		8	7
Kabale district			
Unstructured interview	2		
Semi-structured interview		8	8
Subtotal	5	16	15
Total		36	

2.3.2 Interviewer Training

FANTA recruited a lead researcher and eight research assistants (four males, four females) from Uganda to undertake data collection for this study.

Research assistants underwent 3 days of intensive training that began with a presentation of the objectives and purpose of the study. Research assistants then received instruction on carrying out research at the household level and administering a semi-structured interview. The research team reviewed, edited, and translated the data collection tool, role-playing to become more comfortable with the tool. To further familiarise the research assistants with use of the tool and qualitative data collection methods in the local language, the first two interviews on the first day of data collection were undertaken as pilots. Following these pilots, research assistants discussed their experiences with the lead researcher, modifying the tool as necessary to facilitate understanding and harmonisation of information collection. The lead researcher undertook all unstructured key informant interviews.

2.3.3 Data Quality

The lead researcher was primarily responsible for data quality, including ensuring that research assistants properly recorded and transcribed all interviews and addressed key study themes adequately in the interviews. At the end of each day of data collection, research assistants debriefed with the lead researcher to discuss emergent impressions and themes.

The lead researcher ensured data quality by:

- Recruiting male and female research assistants who were fluent in local languages; had a university-level or higher background in nutrition, social sciences, or related disciplines; and had experience in participatory data collection methods
- Training research assistants on the study objectives and sampling strategy, familiarising them with the data collection tool, and honing their qualitative interviewing skills through role-playing/mock interviews

- Engaging in regular communications and debriefings with the research assistant teams to discuss findings and any data collection issues
- Supervising research assistants through spot-checks and interview observations
- Starting data transcription, translation, and preliminary analysis following the first field visits to improve the quality of subsequent interviews

2.4 Ethical Considerations

FANTA obtained approval to undertake this study from the Higher Degrees Research and Ethics Committee of the Makerere University School of Public Health in Uganda. FANTA also obtained clearance from the FHI 360 Internal Review Board, based in Washington, DC, and North Carolina in the United States. Researchers obtained informed oral consent from all study participants prior to beginning interviews. No informant identifiers are included in this report and all participants were assured of confidentiality.

2.5 Data Analysis

2.5.1 Data Management, Coding, and Analysis

Two research assistants transcribed and translated the collected interview data, with supervision from the lead researcher. Transcription began during data collection to further enable the lead researcher to check the data and make corrections in a timely manner. The lead researcher then cleaned the transcribed and translated data and merged transcribed interviews with field notes to construct the final transcripts.

Data coding and reduction

FANTA and the lead researcher discussed the emerging qualitative data throughout the research process, with themes from these discussions informing the coding process. To code the data, the lead researcher, in collaboration with FANTA, randomly selected and reviewed key informant and semi-structured interview transcripts to identify possible codes. The team then discussed and agreed on codes and developed a code guide with definitions to begin a trial coding of the data. The team independently coded a further subset of transcripts using the code guide, and discussed and resolved discrepancies in the coding to ensure intercoder reliability. The team then finalised the code guide and coded and grouped all of the collected data using ATLAS.ti electronic software. Finally, FANTA reduced the coded data and extracted themes of interest (e.g., land access and ownership, post-harvest practices and issues, diet diversity and household food consumption, livestock practices and issues, gender relations, accessing capital) using the ATLAS.ti retrieval process.

Data analysis

Following coding, FANTA and the lead researcher developed a data analysis plan that started with triangulating and verifying identified themes in the data against those depicted in the conceptual framework (see **Figure 1**, page 7). For each theme, the data were grouped and compared to identify patterns and ranges. Data were grouped by sex and district, as well as by household relative asset base (e.g., land and livestock holdings, access to stable on- and/or off-farm income sources). A team approach was used in the data analysis to triangulate and validate the findings.

2.6 Limitations to the Interpretation of the Study Findings

The findings of this study present the dynamics of smallholder agricultural production and its challenges as perceived by the study participants in two districts of Uganda, one located in the North region and the other in the Southwest region. The results of this study triangulate well with existing

literature on similar topics and shed light on current trends in agriculture and food security that may adversely affect household diet diversity and optimal nutrition outcomes in the study areas.

Because this study sought to understand not only what challenges smallholder households face with regard to agriculture, food security, and nutrition, but also *why* they face these challenges, qualitative study methods were used, as such methods are well suited to provide a more nuanced understanding of current practices and challenges. Given the qualitative methods this study employed, the results are not statistically representative or generalizable to either region in its entirety. In addition, because this study focuses specifically on agricultural production dynamics and the potential impacts of these dynamics on food security broadly and household nutrition specifically, data collection for this study did not delve into other non-food-related issues affecting nutritional outcomes (e.g., child care practices, knowledge of nutrition and hygiene, sanitation conditions, health care availability and access), though the authors acknowledge that these are important additional lines of inquiry that require further research. Finally, because this is a qualitative study, the data collected reflect the study informants' reported perceptions of their household food security.

3. Findings

The data indicate that local realities are consistent with the study’s conceptual framework (see **Figure 1**, page 7). Households in both districts indicated that climate variability often adversely affects crop yields during the production season, as well as during the harvest and post-harvest periods. In Kabale district, informants indicated that land scarcity resulting from increasing population density—as well as from lack of off-farm income-earning opportunities to meet basic needs—fuels labour migration, significantly altering the gender balance of household responsibilities. In contrast, in Amuru district, informants indicated that land ownership disputes, lack of access to labour, and other aspects of the post-conflict transition adversely affect their food availability and access and, ultimately, the household food basket.

The presentation of study findings follows the conceptual framework, presenting the data from the outer concentric circles inward. That is, this section begins with an overview of underlying issues that the study data indicate affect food access. It then presents key proximate factors and dynamics that the data indicate influence food production and food purchase. Finally, it presents how the data indicate that these underlying and proximate dynamics ultimately affect the household food basket.

3.1 Underlying Issues Affecting Food Access

Study informants indicated several underlying issues affecting food production and food purchase. Unsurprisingly, these underlying issues also affect agricultural production, household food security, the food basket, and the food-related factors that influence nutrition in the study areas. These underlying issues, depicted in **Table 2** below, include population growth, climate variability, labour migration (in Kabale district), and post-conflict transition (in Amuru district). While there were broad similarities in some of the impacts of the underlying issues informants reported—such as the negative impacts of climate variability on food production and food purchase (i.e., lower yields leading to lower income and income potential, and higher retail prices when harvested foods ran out)—these issues also differed in important ways between the districts, as is discussed in the following subsections.

Table 2. Underlying Issues Study Informants Identified as Affecting Food Access

	Kabale district	Amuru district
Population growth	X	X
Climate variability	X	X
Labour migration	X	
Post-conflict transition		X

3.1.1 Population Growth

Uganda’s population has grown significantly, having increased nearly fivefold in about 40 years. This macro-level trend translates directly in Kabale district, where the population growth rate is estimated at 3 percent and the population density is nearly 300 people per km² (USAID/Uganda 2012). Such growth has limited land access and contributed to other significant changes in farming, including obliging households to use the same land without a fallow period. One mother farmer in Kabale district noted, ‘[We] used to grow crops and harvest in plenty compared to these days. Now there is less harvest [from the available land] due to the limited land available for cultivation [and depletion of its soils]. There is also a reduction in the land size [available] as [populations increase]’. Some informants in Kabale district also noted that reduced yields and access to land encouraged shorter-term, as well as more permanent, labour migration (discussed in more detail below). A father farmer in Kabale district noted, ‘A lot has changed [in terms of farming in the area]. Land is exhausted [soils

are depleted of nutrients], and you cannot plant anything without applying manure. Land [size] has also reduced significantly, or should I say, there are more people now on the land, so much less land is available for cultivation’.

In Amuru district, the population is also on the rise—increasing at a rate of about 2.8 percent, to 174,000 people in 2011 (Uganda Communications Commission 2010)—though years of civil conflict and resultant significant population displacements somewhat tempered this increase. As a result, the relatively fewer households in this region are broadly able to access more land, and, indeed, have more land to access than those in Kabale district⁴, despite a similar population growth rate (City Population n.d.). Therefore, at this time, underlying issues of climate variability (discussed in more detail below) and the conflict and post-conflict transition’s impact on land access affect the household food basket and food-related nutrition outcomes more than population growth in Amuru district. That said, mother and father farmers and key informants in Amuru noted that they have access to less land than their elders, in part because land is continuously subdivided among the sons in each family. A father farmer in Amuru district noted, ‘During the time we were in the camps, we did not have access to land ... But, now that we have returned home, we have land we got from our ancestors ... The only problem though is that ... we are many using the same land’.

3.1.2 Climatic Variability

Informants from both Amuru and Kabale districts perceived an increase in climate variability—often described as less predictable periods of rain and dryness across the production and post-harvest season—that typically impeded production potential. A father farmer in Kabale district noted, ‘Sorghum [used to] have no problems, but these days seasons have changed and we tend to miss [the best time to] plant ... Sometimes [the sun] shines so much that when you plant the sorghum it dries up. It germinates in patches instead of covering the whole garden. For peas, last season, hailstorms destroyed them ... We did not harvest beans this season. We planted them, then the rain became too much. They dried up in the garden’.

In Kabale district, climate variability, combined with population growth and resultant land fragmentation and deforestation, have led to soil erosion and lack of soil fertility, which informants noted adversely affects crop yields. Reduced yields, in turn, led to reductions in the amount of crops that could be sold and increased retail food prices in local markets. One female informant described these challenges: ‘The soils yield less compared to the past years. This could be due to the fact that the land has been used for many years and it is tired [the soils are depleted of nutrients]. Here people are tilling the same land over and over again. Available land is too small, and we do not have land that is not under cultivation. I am told in other parts of Uganda, people can go and open new land and therefore they are able to [let land lie fallow]. This does not exist here. We do not have virgin land within Kabale’. Climate variability and lack of soil fertility were also identified as significant challenges in Amuru district, and, despite having access to relatively more land, these challenges resulted in crop failure and food shortages in this district as well.

Climate variability makes agricultural production riskier because a larger investment in production inputs—such as fertiliser to improve soil fertility and improved seed varieties that can withstand some climatic shocks—is required to obtain good yields. Even with these input investments, however, farmers can experience unseasonal dryness or rain that reduces their yields, thereby also reducing their income and their ability to access a diverse food basket.

⁴ Kabale district has an area of 1,679 km², whereas Amuru district has an area of more than twice that size: 3,636 km². Given its relatively smaller population and larger area, the population density of Amuru district is about 50 people per km², compared to Kabale’s 300 people per km² (City Population n.d.).

In an effort to spread this risk, households with very small plots of land, particularly those in Kabale district, rented additional plots when they had the means to do so. To produce some food for the household and have income to meet remaining food and other household needs (e.g., non-food items and services, such as health care and education), men and women, in Kabale district in particular, divided time between tending their own land (that they owned or rented) and working as daily wage labourers on others' farms or engaging in other, off-farm income-generating activities.

3.1.3 Labour Migration

Given limited production capacity, the need for income to buy food and essential non-food items and services was one reason informants in Kabale district noted that men often migrate for work. Some men migrated as far as Kampala (about 400 km away), while others sought work in closer towns. While such migration offered households in this district an opportunity to access additional income, it also significantly increased the responsibilities of those left behind (often women) to tend to the fields and the family. This in turn has implications on the yield potential of the plots (given limited available labour) and on the nutritional status of the household (as mothers engaged in more farming work have less time to prepare food and attend to other household tasks).

Engaging in labour migration and other off-farm labour, aside from petty trade, was less typical among households in Amuru district. Populations in this district tended to engage predominantly in agricultural production, either working on their own land during the production season, or, when additional income was required, labouring on others' land for payment in cash or in kind. Households in Amuru district that did have access to non-agricultural livelihood options (e.g., seasonal construction, welding) were typically able to more easily confront food production challenges and ensure relatively more stable household food access across production seasons.

3.1.4 Post-Conflict Transition

Prior to the conflict in the North region, households typically held large numbers of livestock, including larger animals, such as cows. These holdings allowed farmers to cultivate (and fertilise) more land and provided an asset that, when necessary, could be sold for cash to purchase other food items, non-food items, and services. A father farmer from Amuru noted, 'Here in Acholi, we used to have cows ... but with the war ... most of our animals were killed or collected by the rebels and now we don't have them'. The raiding and divestment associated with the conflict and post-conflict transition in this area, and resultant reductions in livestock numbers, led to an increased reliance on agricultural production as a food and income source at the same time as it led to a decreased capacity to optimise outputs from this production, as households without large animals must now find income (e.g., through the sale of cash crops and/or labour or through borrowing) to purchase fertiliser and to purchase or rent animal traction for ploughing. Given this shift in production capacity, the ability to access labour—by purchasing, bartering for, or borrowing it—to prepare lands, weed, and assist in harvesting has gained particular importance in the North region.

Another idiosyncrasy of land access in the post-conflict transition of the North region relates to the variable amounts of land available to households and the productivity of that land, compared to the pre-conflict period. Displacement from and resettlement of families in the region has resulted in land ownership disputes, and some of the informants in this study reported having access to less land now than prior to the conflict. Informants in this region often indicated that land had been usurped by others. One village leader from Amuru district noted, 'Land was more secure in the past, but now things are very different. In the past, chiefs were able to protect clan land, but with all the changes that have happened over the years [civil conflict], land ownership has also changed, and land [tenure] is becoming more and more insecure'.

A mother farmer from Amuru district described the impact of the conflict on land tenure security as follows: 'Some of the people had problems when they came back from the [internally displaced

person] camps, because many people were struggling to take other people’s land ... People ended up remaining with very little land for cultivation’. Another father farmer noted that he lost several acres of ancestral land to the local government, which built health facilities on this land during the post-conflict period. Similar experiences were common in the review of secondary data for this study (Muyomba-Tamale et al. 2010).

In some instances, however, informants displaced from the North region noted that the protracted conflict had actually had a positive impact on their land, allowing it to lie fallow and leading to relatively better yields upon their return. A mother farmer from Amuru noted, ‘In the past, there has been war ... Many of the people lived in the camps, and we left our land for quite a long period without [it] being cultivated. This ... made the land ... rest and we have, of late, been getting good yields’.

Others in Amuru district noted that their farms were close to the camps to which they were displaced, allowing them to continue farming during displacement. This, they felt, had contributed to poorer yields at present, due in large part to decreased soil fertility from continual use. A father farmer from Amuru district noted, ‘During the time we were living in the camps, we used to come and [farm] here, even during the time of the war, and so the land ... is now exhausted [the soil is depleted of nutrients], and whatever we grow sometimes [does not] yield very well’.

3.2 Proximate Factors Influencing Food Access

In the study sample, the main means by which households accessed food was through household production, purchase, and borrowing. These were also the main means by which households accessed many of the production inputs they required. As such, to understand the dynamics of food access and their impacts on nutrition outcomes among households in the study populations, it is important to understand the dynamics of several key factors that influence food production (including farming challenges/production constraints) and food purchase (e.g., income sources, market dynamics, borrowing and supporting services). Distinguishing features of the proximate factors influencing food access in Amuru and Kabale districts are shown in **Table 3** below.

Table 3. Distinguishing Features in Reported Proximate Factors Influencing Food Access in Amuru and Kabale Districts

Key differences between districts	
Land access	<ul style="list-style-type: none"> • Kabale: Farmers accessed land through purchase or renting, with the size of the land measured in quarter-acre increments; land inheritance was limited. • Amuru: Farmers owned more land (renting land was not as common as in Kabale), with the size of land measured in acre increments; land was most often inherited by men from their fathers; it was rarely purchased.
Production constraints	<ul style="list-style-type: none"> • Kabale: Farmers lacked access to and could not afford inputs; decreased soil fertility meant that more investment in land was needed, though this did not guarantee more yield (in particular given climate variability); some informants felt investing more was not worthwhile, as their land was too small. • Amuru: Most farmers noted land access was sufficient, but they were unable to optimally use their land for farming, as they lacked labour, improved technologies, and other inputs.
Income sources	<ul style="list-style-type: none"> • Kabale: Daily wage labour (typically, agricultural) was common, as was labour migration (men). • Amuru: Daily wage labour was less common and only occurred in times of need (e.g., during the lean season, following an unexpected expense); labour migration was uncommon.

Debt, savings, borrowing	<ul style="list-style-type: none"> • Kabale: Credit and savings groups were relatively common and some men and women farmers reported borrowing from these groups to invest in agriculture (either to rent land or buy inputs for farming). • Amuru: Credit and savings groups and borrowing were not common. If farmers borrowed, it was often men borrowing from other farmers. Women would borrow food in kind when faced with food shortages.
Livestock	<ul style="list-style-type: none"> • Kabale: Few informants owned livestock. • Amuru: Owning livestock was more common. • In both districts: Challenges to maintaining livestock (e.g., accessing water, feed, veterinary services) were similar; the purpose of owning livestock (for sale in times of need) was the same, though in Amuru these livestock were also used to plough the district's relatively larger tracts of land.
Key similarities between districts	
Gender issues in land access	Women typically could only access land through spouses or brothers, i.e., women did not own or inherit land.
Post-harvest management	Farmers reported using similar (and non-optimal) post-harvest practices.
Gender issues in post-harvest management	Men and women reported discussing how to manage their harvest; once the portion to be maintained for home consumption was agreed upon, this was controlled by women; the harvest portion identified for sale was controlled by men.
Production constraints and coping	Food shortages were common with similar causation (lack of adequate production and post-production practices) in both districts; many families faced shortages of up to 4 months out of the year (this was often lower in Amuru district and sometimes higher in Kabale district).
Gender and food access	Women earned less than men, a reflection of fewer work opportunities for women and less time available to engage in this work, given other responsibilities (not necessarily lower wages).

3.2.1 Food Production and Farming Challenges

Given the role of agricultural production as a key source of food in the study areas, some focus on household food production and farming challenges is necessary to better understand overall food security conditions and their implications for nutrition outcomes. Key factors that the data indicate influence food production in the study areas are shown in **Table 4**. Farmers in Uganda's Kabale and Amuru districts reported many challenges associated with these factors, all of which increase their risk of food insecurity and ultimately threaten optimal nutrition outcomes.

Table 4. Agricultural Production Limitations in the Study Areas in Uganda

Amuru district	Kabale district
<ul style="list-style-type: none"> • Climate variability • Lack of access to inputs to improve production (improved seeds, fertiliser, pesticides) • Theft of seeds, crops, harvests • Lack of adequate post-harvest storage, inputs, and transport • Insecure land tenure, post-conflict • Lack of agricultural labour availability for clearing, planting, weeding, and harvesting • Lack of/loss of efficient production techniques (e.g., from animal traction to hand hoeing) due to conflict 	<ul style="list-style-type: none"> • Climate variability • Lack of access to inputs to improve production (improved seeds, fertiliser, pesticide) • Theft of seeds, crops, harvests • Lack of adequate post-harvest storage, inputs, and transport • Increasing population density, leading to small land allocations, land sales, and eroded, depleted soils • Lack of labour opportunities, less labour available for production due to labour migration

Land access and allocation

Land is a key requirement for agricultural production. The study data indicate that informants in Amuru district, with its relatively larger land area and smaller population, have access to more land relative to their counterparts in Kabale district. For example, in Amuru district, land is generally measured in acre increments, as opposed to quarter-acre increments in Kabale district (see **Table 5**). Land in Amuru district is also relatively coterminous, compared to that of Kabale district.

Table 5. Reported Size of Land Holdings, in Acres, in Uganda’s Amuru and Kabale Districts

Amuru district	
No land (1.5 borrowed from neighbour)	7 (owned)
3 (owned)	7–8 (owned and rented)
3 (owned)	8 (owned and rented)
3 (owned)	10 (owned and rented)
4 (owned and rented)	10 (owned and rented)
4 (owned, additional plots rented)	20 (owned and rented)
5 (owned)	20 (owned, additional plots rented)
5 (owned and rented)	
Kabale district	
No land	0.50 (owned)
No land	1.00 (owned)
No land	1.00 (owned)
< 0.25 (owned)	1.25 (owned)
< 0.25 (owned)	1.50 (owned and rented)
0.25 (owned)	1.50 (owned and rented)
0.25 (owned)	1.75 (owned)
0.25 (owned)	2.50 (owned)

Key informants from both Amuru and Kabale noted recent changes in land allocation. In Amuru, one key informant noted that in the past, land was managed and allocated by a clan chief: ‘Traditionally here in Acholi, land belonged to the clan. These clans are headed by a clan elder or a chief. Chiefs were identified from among the sons within a lineage. The chief was therefore the custodian of the clan land, and in essence, it was assumed that he had the authority to allocate clan land’. However, another key informant from Amuru noted that this had changed as a result of the conflict and national land reform policies: ‘People left their ancestral homes and went to live in internally displaced person camps during the war. During this time the 1995 constitution [which pronounced that land belongs to individual families] was drafted. From then on, the land that individual families would own was determined by what their grandparents owned’.

In contrast, in Kabale district, the transition to the current pattern of land access—which is dominated by purchase or renting of land—started decades earlier, as noted by a key informant: ‘By the [first half of the 20th century], land shortage among the Bakiga [an ethnic group located in northern Rwanda and southern Uganda] was apparent. Clans started sharing whatever they had with their kin ... [and] in every family, a father would share his land with his sons. But over the years, the [population was growing], and for some families there is not much to be shared, or whatever is shared is too small. Many individuals are therefore buying land which is available from individuals who want to sell land’.

Land in Amuru district continues to be largely handed down along family lines. In Kabale district today, however, informants noted it was increasingly common to access land through purchase or rental of small parcels. One mother farmer from Kabale noted, ‘There are some people who rent land here. To get the money to rent this land, some sell their produce, like sorghum, and use that money to rent land that they will then cultivate to support their families. [Others] borrow from [savings and credit] groups [to rent this land]’. Another mother farmer in Kabale district noted of the shifting land allocation system: ‘Very few old people have any land to pass on to their children, so men have to buy land’.

In the few instances where study informants in Kabale district noted accessing land through inheritance, it was small—often less than 1 acre. As noted above, land plots in this study area were rarely co-located, with most informants describing plots as being scattered across areas surrounding the village. While such a tenure structure spreads risk (e.g., allows the potential to access more diverse soil types, and prevents wholesale crop damage from specific acute pests, diseases, and climatic events), having a scattering of small plots has the potential to limit production potential, as overall land sizes are relatively smaller and the time available to work on them (including monitoring them for damage and theft) is reduced, given the need for farmers/labourers to travel between plots.

Gender dimensions of land access and allocation

As previously noted, informants reported land purchase to be more common in Kabale district, whereas the majority of male informants from Amuru district noted inheriting land from their father. Similarly, most female informants in Amuru district noted that the land they farmed belonged to their husband, and was typically inherited from their husband’s father. However, in both districts, it was always men who inherited, bought, or rented land. Where possible, grandfathers and fathers distributed land among sons. Land was never given to daughters. Instead, women accessed land through their husband, their husband’s family, or their own brother (in the absence of a husband). Male and female informants noted that men typically apportioned their wives some of the total land available to grow food crops, with the majority of these crops used for household consumption, while men used remaining land for cash crop production. In polygamous families in Amuru district, men noted apportioning each wife her own land. The data did not indicate that men apportioned less desirable land plots to their wives. Rather, across Amuru and Kabale districts, where men and women were both present in the household, they largely reported working together to maximise outputs from whatever land was cultivated⁵.

In the event of divorce, informants noted that women typically accessed land through their brothers, who shared a portion of their own land to sustain the divorcee and her children. The male children of these ‘returned’ wives could not, however, inherit land from their mother’s family.

Additional proximate production constraints

Informants in both districts noted several additional proximate constraints to food production beyond land access and allocation. In Amuru district, where land holdings were larger and the population smaller, production challenges centred more around a lack of labour to work the land, a lack of improved technologies (e.g., ox-drawn ploughs) to facilitate more planting, and a lack of access to the other inputs necessary to optimise production (e.g., fertiliser, improved seed varieties). During the production season, this meant that farmers were not always able to clear and plant on all of their land because they did not have, or did not have access to, equipment to plough the land, the labour to plant the seeds, or the seed needed. In describing these challenges, one father farmer from Amuru district

⁵ Among informant households engaging in labour migration, particularly in Kabale district, this level of spousal collaboration was less consistent. Rather, with men migrating for labour from this area, women were sometimes left to entirely determine how best to maximise the outputs of cultivated lands.

noted, ‘Most of us farmers don’t have the capacity to dig bigger gardens. We are limited by resources because we dig using hand hoes and this [does not allow us to] dig very big land or gardens’.

Men and women farmers noted distinct roles and responsibilities related to farming, with women responsible for weeding, assisting in preparing the land, planting food crops, and helping with the harvest and post-harvest processing. Men, in contrast, were responsible for assisting in preparing the land, planting and harvesting cash crops, and managing the storage and sale of these crops in the post-harvest period. Despite this clear distinction in roles and responsibilities, overall, men and women across the study population reported that they worked together on their farms, strategizing what to plant for subsistence and for sale. Though men, as the heads of household, typically had the final say in each of these decisions, the data indicated that many men appeared to value their wives’ input.

Lack of labour and other inputs (e.g., herbicides) during the production season meant that women in both districts spent the majority of their time during this season weeding by hand, which is a time-consuming process that leaves little time to prepare food or complete other household tasks. While the data indicated a few cases of women working in groups to weed the land, for many there was not enough labour or access to the other inputs needed to weed more efficiently. This lack of adequate labour to work the land is exacerbated, in some instances, by the negative perceptions of farming held by young adults who had spent the majority of their lives in internally displaced person camps during the conflict. Because they were not exposed to farming as a way of life and were provided with basic food necessities while in the camps, this group commonly perceived farming to be hard work and an undesirable profession.

In contrast, in Kabale district, additional proximate production challenges households faced included a lack of resources to invest in farming. For example, households reported not having enough money to buy fertiliser, manure, pesticides, or improved seeds. A father farmer from Kabale district noted, ‘We have a problem of pests and also the money to buy the pesticides ... Also the sorghum harvest was poor because we delayed to plant sorghum in its season ... Some of us lacked the money to buy planting inputs, and also having too much work [to do] delayed some of us. You find that you need to plant ... many [crops] and ... there is [the] need to pay for someone to do this work. Where we lack the money to pay these people ... we end [up] doing it ourselves. In the long run, [that] causes [a] delay to plant some of these crops’.

Households in Kabale also lacked access to improved farming technologies. Relative to Amuru district, few households in Kabale reported being trained by the National Agricultural Advisory Services in improved farm practices, such as planting seeds in rows rather than broadcasting, and using manure and other fertiliser. Some informants noted that at times they had access to improved seed varieties, but this was not consistent. Even when households could afford to buy and use inputs in the planting season, this did not necessarily assure them of a better yield, largely due to climate variability. In Kabale district, it was relatively more common to borrow money from a savings and credit group to invest in farming. As a father farmer from Kabale district noted, ‘I use the local seeds. I also put in manure and sprayed the crops. I worked for some of the money I used, and I also borrowed money from the farmer’s group’. Several study informants noted that in some instances this borrowing had left them indebted and needing to migrate for work, or to borrow money from others to pay off their debt, as is discussed in more detail in **Section 3.2.2**.

In Kabale district, farmers noted the need to use manure or fertilisers to improve the quality of the land and overall farm yields. Informants explained that land was depleted of nutrients, as it had not lay fallow for a sufficient (if any) time, which adversely affected farm yields. In some instances where farm plots were very small, farmers noted that their land size did not justify the use of such inputs (i.e., that the harvests received from using the inputs would not sufficiently offset input costs) and/or that they did not have the means to purchase them.

Post-harvest production constraints

Production challenges in the post-harvest period were present in both districts, with informants noting limitations to using improved harvesting and storage practices, and the labour, other inputs, and transportation required to facilitate them. In both districts, informants reported using inputs, such as chemicals, storage bags, and tarpaulins, to process harvests. Most informants reported that they tried to dry and store harvests for future consumption, for use as seed in the following production season, and/or for sale once retail prices had increased. Many, however, reported that they no longer stored foods in granaries for fear of theft or other loss (e.g., fire). A female farmer in Amuru district noted, ‘We used to have a granary, but ... we no longer use it for keeping our crops once [they are] harvested because of thieves ... That is why we keep the crops where we sleep’.

Informants in both districts noted that poor storage and climate conditions—in particular, too much rain during the harvest and immediate post-harvest period—often contributed to post-harvest losses, as crops could not be properly dried for storage. As a mother from Kabale district noted, ‘When I have harvested sorghum, I dry it, thrash it, and use chlorine to preserve it in the bags. I buy this from the shops. This helps fight the moulding of the sorghum [during storage]’.

Several informants in both districts reported that, if they had the means, they would use chemicals and pesticides to extend the shelf life of stored crops. In other instances, where resources allowed, households noted processing crops (such as sorghum) into flour for later use. Post-harvest crop losses due to attacks by pests, including rats and insects, were also reported.

In Amuru district, constraints related to limited labour availability, as well as limited ability to pay for labour, continued to be pervasive in the post-harvest period. In several instances, farmers from this area noted they were unable to harvest all they had planted and that some crops rotted in the fields. A mother farmer in Amuru district noted, ‘It is only my husband and [me], and there are moments when we get good yields from what we have planted and being only two of us, we find it difficult to harvest the crops on time’.

Gender dimensions of post-harvest production

Similar to gender roles in the production stage, in the post-harvest season, the study data indicate a fairly high level of communication and cooperation between men and women in most informant households, particularly in households where the man and woman are both present (in contrast to the trend in some households where the man migrated for labour opportunities and the woman was left to make post-harvest decisions on her own). Upon completion of harvests, women and men noted that they typically discuss what crops to sell, in what quantities, and what to keep for home consumption. While men maintained the role of final decision maker on these matters, they often deferred significantly to the women as to the overall management of crops grown for home consumption.

However, there was variation in this cooperation across the study sample, with some men and women reporting that men alone make certain decisions; women alone make other decisions; men and women decide jointly how to manage the harvest; and, in some instances, women participate in the decision-making process, but men have the final say in how to manage the harvest. In the majority of households interviewed, once the harvest is divided between food for sale and food for home consumption, women had full control over the use of food to be consumed by the household, while men maintained total control over food to be sold. A male informant in Amuru district noted, ‘Once food is in the store ... madam takes control [of the food for consumption at home], [while items] for sale, like rice, are [controlled] by men’.

One male informant from Kabale district reported disagreements with his wife, stemming from gender roles related to post-harvest production: ‘The other problem is disagreement—for example ... [you] plant sorghum together ... and you need a certain portion for yourself [for sale], [but] you find your

wife not in agreement with your idea. When we [men] decide to sell the harvested sorghum, our wives say, ‘That sorghum you are going to sell is mine’.

One female informant from Kabale district noted the perceived threat of violence if a woman challenged traditional gender roles in these decisions, stating, ‘We sit down and discuss as a couple what to sell based on what is lacking at home [that we need cash to procure], like clothes and [other, non-staple] food. After harvesting, we sit and list our needs. I tell him what I need and what [the] children need, and he also lists his needs, and we agree on what to sell in order to buy the agreed upon needs ... It is the man [who has the final say], as he is the head of the home. If you refuse, he will beat you up. So he has the final say on what to sell and what to buy’.

Another female informant from Kabale district described her role as the decision maker when it came to determining how many crops were to be grown and, of these, how many were to be kept for consumption and how many were to be sold: ‘I am the one who decides, because I am the one who stores everything that we have as food at home. I first estimate how much of the produce will be enough for our consumption at home, and it is from this that I decide those to be grown, eaten, or sold’.

In cases where households harvested very little, the entire harvest was typically kept for home consumption.

Coping with food shortages

In both districts, food shortages were common, particularly in the midst of the production season, before new crops were ready for harvest. As a mother farmer in Amuru noted, ‘There are months when we really don’t have enough food to eat. In May to July ... most of the food we have is [running out] or just very little. During that moment, we always eat very little and the food we [have] is used sparingly’.

In Kabale district, where land sizes were smaller and yields relatively less, food shortages were common throughout the year. As a mother farmer from Kabale district noted, ‘We are going to plant next month [September] and harvest in January. By March you find that there is no more food. Others then plant again and harvest in June. So you find that for about 4 months a year there is no food available at home ... Food shortage mainly occurs because we produce little food since we do not have enough land. Also some of the food we plant is attacked by pests and the climate changes, and we lose a lot of it’.

Efforts to minimise food shortages included using improved production practices, such as crop rotation (i.e., growing different crops on a given parcel each production season) and mulching. A male informant in Amuru district noted, ‘Once I have planted a particular crop this year in a garden, the following year I try to rotate another crop in that garden to avoid exhausting the land. And sometimes I leave it for a period of time to rest [so] that I can get a good yield in the following season ... Then also, the grass that I dug, I leave it in the garden to rot there before planting any crop ... to give moisture to the garden’.

Even with these efforts, households in both districts must often find ways to cope with food shortages. Typically, this is done by seeking income to purchase food needs during this time. A mother farmer in Amuru district noted, ‘My husband resorts to doing small-scale business ... We have cows, so he can sell one and then use the money for buying food ... the same with the goats and chickens ... Then sometimes I go to work in other people’s gardens, or we borrow food that we don’t have from the neighbours. Then also my small business of selling [dried minnows] helps us during those hard times of getting food for the family’.

A mother farmer from Kabale district noted her household coped with food shortages via labour migration: ‘My husband usually goes to sell labour and then sends money home for us to purchase food from the market. That is how we normally survive during those tough times. If he doesn’t send [money,] I also go and sell labour for some days in a week and we survive that way ... Sometimes we even go without food and just drink water for supper’. Access to income sources to purchase food and non-food needs is discussed in more detail in the following subsection.

3.2.2 Food Purchase

To understand the dynamics of food access, its relationship with agricultural production, and its impacts on nutrition outcomes among the study populations, it is important to understand the characteristics of several key factors behind food purchase (e.g., income sources and market dynamics) and borrowing (e.g., formal and informal credit mechanisms, savings, and debt).

Income sources and market dynamics

As previously noted, nearly all of the households in this study did not produce sufficient quantities or a sufficient diversity of food to cover their consumption requirements, much less non-food and essential service needs (e.g., clothing, health care, education), throughout the year. As such, to meet remaining basic food, non-food, and essential service needs, households in Amuru and Kabale districts relied on income-generating activities (see **Table 6**). In both districts, many men dedicated a portion of their production activities to cash crops to be sold to generate income. Given the production challenges previously noted, however, yields and resultant earnings from cash crop production were often also insufficient to close the gap in meeting households’ remaining needs. Therefore, some households in both districts also engaged in agricultural daily wage labour on others’ farms and/or in other off-farm labour opportunities, for payment in cash or in kind. Still, many informants noted that what they earned, in addition to what they produced, was not enough to feed their families. A father farmer from Kabale noted, ‘The income I get is small, and even the crops are not enough to feed the family’.

Labouring on others’ farms was especially prevalent in Kabale district, where additional sources of income are nearly imperative, given limited access to land and small prevailing land sizes for crop production. Although working as an agricultural daily wage labourer was common in Kabale district, study informants noted that there were frequently not enough work opportunities for regular daily wage labour, leading to a need for labour migration. A father farmer in Kabale district noted, ‘You look for work, fail, and then come back ... As a family we face some difficulties looking for [work] to do. We have to move to [far portions of the] sub-county to look for work’.

In Amuru district, working on others’ farms was a less common practice. Among study participants in this district, households engaged in working on others’ farms for wages when they had relatively less land or needed money to pay debts or meet other commitments that could not be met by their own harvests.

Families in both districts that had the capacity (i.e., labour availability, skill, required capital) also engaged in off-farm labour opportunities (e.g., bicycle repairs, construction, welding, working in a bar) to supplement their income, though this was somewhat more common in Amuru district. These households typically had more stable food security, including more diverse food consumption, across production seasons and were able to invest more in their agricultural production (in terms of inputs) and, hence, reap more (in terms of food and income) from these investments.

As previously noted, an important income source for households in both districts was sales of cash crops (e.g., rice in Amuru district and sorghum and potatoes in Kabale), typically undertaken by men, and, to a lesser extent, sales of surplus food crops (crops produced for home consumption), undertaken by men or women. A female informant from Kabale district noted, ‘It depends on the

yield. For example, if we harvest enough sorghum, we sell some and store the rest ... All of the ... foods that we grow here are consumed at home. We only sell if we need something else that we do not have or we have excess food. However, it is rare lately that we have enough to sell, as we produce not enough food and we consume [almost] all of it’.

Table 6. Reported Typical Sources of Income in the Study Areas

Reported income source	Amuru district	Kabale district
Cash crop sales	Rice	Sorghum, potatoes
Surplus food crop sales	Sorghum, millet, maize	Sweet and Irish potatoes, plantain, sorghum, millet, maize
Livestock sales	Large and small ruminants and fowl	Mostly small ruminants and fowl
Daily wage labour	On others’ farms (occasional, when necessary) and off-farm such as construction or working in a bar (when resources allowed)	On others’ farms (common) and migratory (common)

The data indicate that men and women in the study areas had a good understanding of the optimal market dynamics associated with crop sales (i.e., to hold crops for sale until well after harvests, when wholesale and retail prices are increasing, to receive the best return on investment). As one male informant from Amuru noted, ‘Determining when to sell the crops produced ... [normally] depends on the market price. Once the market is favourable ... we sell the rice we have harvested. Most often, once we have harvested, we keep the rice for some time in the store, since the market would be flooded with a lot of rice, and at that time, the price is ... very bad. People sell it cheaply [then], as low as 1,500 [shillings per kilogram]; but once it is scarce, I can even sell a kilogram at 2,800 shillings or ... 3,000 shillings’.

While households indicated an understanding of market dynamics, many households did not have the storage capacity, cash flow, or savings needed to wait until well past the harvest to sell their crops. These households were forced to sell a portion or all of their cash crops at the harvest, when prices for these commodities were lowest. A father farmer in Amuru noted, ‘The only problem that we get with [rice] is that the price for the rice in the market is so low [at harvest], and we end up losing [money]. It is like we are just giving it free of charge to the buyers and yet you find you have spent a lot of money buying the seeds’.

For households faced with poor returns on their agricultural investments, accessing income sufficient to meet household food needs is challenging. A mother farmer in Kabale noted, ‘Food used to be there [in the market] in plenty and it was cheap, but now with less food produced, the [retail] prices of this food have shot up, which has ... affected us’.

Dynamics of cash crop sales aside, it is only when households noted particularly difficult financial circumstances that they reported selling food crops not produced in surplus to generate income needed to meet other needs.

Livestock

In this study, informant households noted they kept livestock as a liquid asset and a source of income. Aside from an occasional fowl (e.g., chicken, ducks), livestock were rarely used for household consumption, though farmers with livestock noted that they sometimes consumed animal by-products (e.g., milk from cows, eggs from chickens). In both districts, there was some variability in livestock ownership, with men from households with livestock generally owning cows and larger ruminants, and women sometimes owning smaller animals, such as goats, sheep, and chickens. Men and women in both areas reported selling these animals in times of need, with the decision to sell usually taken jointly, and men having the final say. A father farmer from Amuru district noted, ‘For the cows, if

there is any problem, we ... can sell one and it solves the problem ... But if that [problem] is not there, then we don't sell any ... [Selling a cow] is [what I do] only when I have exhausted all the avenues I have for getting money. It comes as a last resort'.

Several of the farmers who owned livestock reported challenges managing them, including not having the resources to care for sick animals—either the money to pay for care or the availability of veterinary services nearby. Other problems included theft, finding grazing land and water sources, and having to remunerate neighbours for damages that escaped animals caused on their land. A mother farmer from Kabale described several of the livestock challenges her household faces: 'Sometimes they [livestock] fall over steep hills, or they suffer from kashanku [anaplasmosis, a tick-borne disease] ... We were taking [the animals to graze on other people's land]. But since they told us to use our own land ... [which we do not have] we might end up selling them'.

In Amuru district, where livestock ownership was more common, households tended to own various animals, mainly cows, goats, sheep, pigs, and chickens. Ownership of livestock among the sample in Amuru ranged from owning no livestock to owning several large ruminants. Most men and women in this area noted that livestock was owned jointly, with men having the final say on its sale. In some cases, women owned chickens and were free to sell them in times of need. Most families in Amuru district that owned livestock reported similar challenges to those reported in Kabale district, namely, that they were constrained in accessing veterinary services, lacked money to use veterinary services, and lacked ready access to land for grazing.

Some families in Kabale district reported owning several livestock, usually chickens, goats, pigs, rabbits, and, to a limited extent, cows. As in Amuru district, households that owned livestock typically kept large ruminants, which were managed by men, for breeding, manure, and as an investment/asset to be sold in times of need (e.g., for significant expenses, such as school fees, illnesses, and marriage). Fowl, such as chickens, were typically managed by women and used for smaller-scale income generation for daily needs (e.g., to buy additional staple or complementary foods) and for consumption, particularly for household visitors.

Debt, savings, and borrowing

Borrowing (taking on debt) is another means by which study households reported accessing needed food and non-food resources. However, this strategy comes with significant potential risk, in particular if repayment of what is borrowed hinges on agricultural production (e.g., repayment in kind using harvested crops, or repayment in cash using proceeds from the sale of harvested crops) or the land upon which the crops are grown (e.g., using the land as collateral and being forced to sell it when production is insufficient for repayment). In addition, reported loan terms frequently require paying back nearly or more than double what was borrowed (e.g., borrowing one basin of seed and paying back two or three basins), especially in Amuru district. This becomes particularly challenging when sub-optimal production conditions lead to limited harvests. If production on borrowed product is limited or fails, repaying the loan becomes difficult and can require further borrowing and decreased willingness to lend on the part of the lender. A father farmer from Amuru district noted, 'Usually, we [farmers] lend [food for consumption or seed] to each other, and once the crops have been harvested, you ... pay back what you borrowed ... The only problem with that is once you have borrowed and then in that year, by bad luck, if there has been [drought], the crop planted does not yield a good harvest. That means you will be unable to pay back that year. So, you will be forced to go and borrow again. That means what you have to pay back will be doubled ... It is a risky venture, but at times there is no option other than doing that'.

In both districts, given limited stable cash flows, male and female farmers reported formally (to a limited extent) and informally (more commonly) borrowing money and food, using services on credit, and bartering as a means of accessing needed food and non-food items. As a male informant from Kabale noted 'I borrowed the money and invested it in farming, but I did not get it back [because] the

crops did not do well ... I got a friend [to lend] me money and I repaid the loan. Then, I went to look for work, where I paid back my friend’.

Typically, borrowed items included food for home consumption, seed, and non-food items for production (e.g., land, oxen for ploughing). In both districts, only a few male farmers reported accessing credit from banks or other formal savings and lending institutions, though male and female informants in both areas noted the existence of and, in some instances, borrowing money or accessing credit from formal and informal savings and lending groups. Formal and informal savings and lending groups were more prevalent, and borrowing from them was relatively more common, in Kabale district. In contrast, informants in Amuru district reported that borrowing from such groups was rare. However, borrowing seed, other productive inputs (e.g., hiring plough tractors or oxen), or foodstuffs directly from other farmers in this district, or borrowing the money to access them, was relatively common, with repayment offered through harvested crops or with money from the sale of these crops. As a mother farmer from Amuru noted, ‘Sometimes we have problems getting seeds and ... when that occurs, we usually borrow from our neighbours who [may have] some extra. Then [we] repay [them] later, when we have harvested our crops’. Another mother farmer in Amuru district described the conditions that led her household to borrow seed from a neighbour: ‘In the last planting season ... we did not have seeds and there was no money available to purchase the seeds. We [asked neighbours] to borrow from them and they [our neighbours] gave [the seeds to] us. We borrowed a basin of rice and will have to return ... about two to three basins ... once we have harvested ours ... We had to borrow [the rice seed because] we sold most of the rice we planted [last] season because we needed money to solve a few family needs ... So, we did not leave any for seeds’.

In Kabale district, money was sometimes reportedly borrowed to rent land for farming or to purchase inputs, such as seeds or manure for planting, or other items for post-harvest processing and storage or transportation. However, it was uncommon in Kabale district to borrow money to hire equipment to prepare the land for farming (such as tractors or oxen), given that land parcels were much smaller, typically located on hillsides, and scattered over a wider geographic area. In contrast, in Amuru district, it was rare for farmers to borrow money to rent land.

In both districts, men and women noted several financial and social risks associated with borrowing money or goods. The most commonly cited risk was losing (collateral) assets—e.g., livestock, harvested food, and, in Kabale district, land—due to default. In Kabale district, where borrowing money from savings and lending groups was more common, it was also possible for men and women to be asked to leave the group when they did not repay their debt on time, further limiting their opportunities to access income when they needed it.

Those men and women who were among the poorer farmers encountered in the sample in both districts noted that they would not borrow because they did not have the means to repay the debt and could not risk losing assets due to default. Nearly all informants that discussed borrowing also noted the conflict and social marginalisation that can result from an inability to repay debts. A female informant from Amuru noted, ‘I usually don’t like borrowing things ... because when [we] fail to pay back, especially with things like crops, it puts us in bad shape with the person from whom [we] borrowed’.

Gender dimensions of income sources

While both men and women engaged in on- and off-farm casual labour in the study areas, men typically earned more income than women—not necessarily because they were paid more for the same work, but because they were able to engage in more paid labour opportunities. As one male informant in Amuru noted, ‘I do get more [money/income] than [my wife] since I am a man ... Women most [of the] time think about food stuff only ... but for me, as a man, I have other means through which I [get] money’. For example, men might engage in cash cropping, as well as construction or migration in search of labour opportunities in other areas (e.g., working on

commercial tea plantations), while women typically tended to food crops (in their own and/or others' fields) and looked after the household.

Despite these fairly clearly ascribed gender roles—women engaging in food crop production and some (typically petty) sale of food crops, and men engaging in cash crop production and sale and other income-generating opportunities—communications between men and women about income earning and how to use the income earned appeared to be collaborative across the data. As one father farmer from Amuru noted, 'If we are to make decisions on anything, be it farming, selling, and buying of anything, or even other family affairs, I discuss [it] with my wife. I don't decide alone'. Similarly, a mother farmer from Kabale noted, '[My husband and I] look at what we are lacking at home and we decide [together] on how much to sell and what to store ... We discuss and agree as a couple'.

3.3 Food Access and the Household Food Basket

While it is understood that food utilisation/consumption and, ultimately, nutrition outcomes, depend on both food and non-food factors—including an adequate, diverse diet; access to clean water, sanitation, and health care; and knowledge of appropriate care practices—this study focuses on the foods households typically consume (typical diet diversity) and the factors influencing this consumption, including money, time, and availability of needed inputs (e.g., potable water, fuel).

3.3.1 Diet Diversity

As previously noted, the variety of foods households consume depends largely on their own food production and their ability to purchase complementary foods. Informants in both districts reported consuming relatively monotonous diets. Typically, these diets were heavy on staples, with some pulses, limited vegetables, and fruits only seasonally. Most households reported consuming animal proteins only rarely, as these were relatively more expensive and difficult to access, in particular for households without livestock.

In Kabale district, families commonly consumed Irish potatoes, sweet potatoes, and sorghum porridge. Few informants in this area reported consuming *matoke* on a regular basis—a surprising finding given that *matoke* has traditionally been a key staple of the Southwest region⁶. Vegetables that informants reported consuming in Kabale district with some regularity (a few times a week) included leafy greens and eggplant.

In Amuru district, families consumed staples such as sorghum, millet, maize, potatoes, and sweet potatoes most commonly. They also reported eating leafy greens, okra, and eggplant regularly. An important difference reported between the districts was that, in Amuru district, a greater variety of local vegetables was consumed regularly, while in Kabale district, only a few local vegetables were eaten with any regularity. In both districts, families reported eating pulses, such as beans and peas, relatively frequently.

Most men and women reported that food was prepared in the study areas only once or twice a day. Often this meant that women prepared the evening meal, with the family consuming leftovers from this meal or a simple staple porridge (e.g., sorghum porridge) for breakfast. Some women in the study noted that they were able to return home to prepare lunch. Meal preparations also varied somewhat by season. For example, in both districts during the production season, it was common for women to return home late, preparing only one meal (the evening meal) and spending the remainder of their time in the fields preparing land and/or weeding. During the off-season, meals were prepared

⁶ Potential reasons for the relative paucity of *matoke* consumption in this area include reduced availability of the crop in recent years due to increased incidence of crop diseases, such as banana bacterial wilt, and reduced production of the crop due to decreasing land sizes.

relatively more frequently (e.g., at least two meals a day), though this also depended on the amount of food available to the household and time spent generating non-agricultural income.

While diets among households in this sample lacked diversity, informants expressed a clear appreciation of the importance (and palatability) of a diverse diet, though access to this diversity proved a significant challenge for many.

3.3.2 Constraints to Diet Diversity

While both men and women acknowledged a desire for greater variety in their meals, the main limiting factor they identified was a lack of money to buy diverse foods. Food prices (and available incomes) were significant in determining what foods and how much of them women bought. For example, households tended to consume from their own production following harvests (when retail prices for food crops are lowest), and began to access commodities from the market only when supplies from their own harvests ran low (when retail prices for food crops typically rise). Thus, the amount of food these households were able to access when the need to purchase arose was limited.

A major factor limiting diet diversity noted in both districts was lack of women's time, caused by competing priorities among food preparation, farming, other income-generating activities, and household chores, such as collecting fuel and water. Men and women informants reported that finding fuel and water could take a significant portion of women's time, limiting the time they have to prepare food. A father farmer from Amuru district noted, 'She [my wife] faces [challenges in food preparation related to] getting items for cooking ... The workload is [too] much for her. She has to balance between time for her cooking and garden [farming] work. Then also there is no firewood, and getting it is hard ... With water, it is there, but it is far from home ... She has to go and fetch it from ... about a mile from here'. Similarly, in Kabale, a mother farmer noted, 'The [water] situation here ... is bad because water is very far away. You have to walk a long distance to fetch this water ... Sometimes you cook late because of too much work. Also lack of water can make you cook late. If I don't go there [to get water] myself and I wait for the children to bring it, we can eat late because they are delayed along the way'. In addition, some women informants noted that certain foods, like dried beans and peas, require more fuel to cook, which influenced what women prepared for the family meal.

Informants noted that women's lack of time to prepare food, and having to prepare food late in the evening, sometimes resulted in children going to bed without eating an evening meal, particularly at the peak of the production season, when agricultural labour demand is heaviest. As a mother from Amuru noted, 'Feeding the children is difficult, and I am not there to cook for them until evening and some of them [go to] sleep hungry'.

4. Discussion and Recommendations

4.1 Main Study Conclusions

The study results indicate that the relationship between agriculture, food security, and nutrition in Amuru and Kabale districts of Uganda is complex and changing in important but somewhat different ways. Overall, the data show that the study participants in both districts face challenges at every level that adversely affect their food access (in terms of food production and purchasing power) and, ultimately, food utilisation/consumption (in terms of the diversity of the household food basket and time and other resources available for daily food preparation). While many of the constraints to agricultural production that men and women reported in this study are not new, the routine co-occurrence of so many of them undermines households' ability to achieve food security and optimal nutrition.

This research set out to better understand how agriculture could be leveraged to improve nutrition outcomes. The findings from this study suggest that while there is some scope to improve agricultural practices and yields—more so in Amuru district than in Kabale district, given the differences in land availability—the extent to which agriculture can improve food-related nutrition outcomes is limited by the effects of population growth and climate variability in both districts, as well as the dynamics of labour migration in Kabale district and the post-conflict transition in Amuru district. The majority of households in this sample from both districts were unable to rely solely on what they produced from their land, either to meet basic food and non-food needs broadly or to achieve a diverse diet. This finding is consistent with other literature from Uganda and elsewhere that indicates that smallholder farmers are also typically net buyers of food.

Overall, the data confirm the linkages presented in the conceptual framework. The data show that in these two districts a household's ability to ensure good nutrition in terms of food-related factors, for mothers and young children in particular, is constrained by combinations of the following issues:

- Labour migration (particularly in Kabale district), which while holding the promise of an additional household income source, shifts even more agricultural production and household maintenance responsibilities onto women (as it is typically men who migrate from the household in search of labour).
- Post-conflict transition (in Amuru district), which has shifted the household asset base (e.g., reduced livestock ownership, changed land availability) and related production practices (e.g., reduced access to animal traction for ploughing and manure for fertiliser).
- Climate variability, which makes planning for the production season difficult, increases the risk of climate-related production losses, and increases the cost of production to manage these risks.
- Population growth, which significantly strains the country's natural resource base (e.g., available land, water, fuel).
- Proximate issues affecting food production, including lack of access to land as a result of population pressure and shifting land tenure policy and practice; poor soil fertility due in part to overuse of land; increases in climate variability; and lack of capital to invest in farming inputs, including labour and technologies to optimise yields and offset production risks.
- Proximate issues affecting food purchase, including a lack of stable agricultural and non-agricultural income-earning opportunities; low wages; high retail food prices when food purchases become necessary; and resultant low aggregate household purchasing power.
- Proximate issues affecting the household food basket, including a lack of resources to produce or purchase an adequately diverse food basket, a lack of time for women to prepare foods with adequate frequency, and lack of easily accessible fuel and water sources.

These underlying and proximate issues negatively affect the household food basket and overall food utilisation/consumption.

Conclusions of this study that are particularly relevant to agriculture, food security, and nutrition include the following:

- In Amuru district, opportunities may be greater for optimising agricultural production (e.g., via increasing access to inputs and improved technologies), given the district's relatively larger land area and lower population density, and households' relatively larger land holdings. However, efforts to optimise production must simultaneously address issues stemming from population growth, such as natural resources management and expanded access to family planning services. Securing stable land tenure is also important to incentivise households to invest in their land. Creation of stable on- and off-farm income-earning opportunities to further improve incomes and mitigate risk is also necessary, as are initiatives to protect women's time to complete household tasks. Without such an intersectoral approach, efforts to optimise production are unlikely to remain successful in the medium and longer term.
- Farmers in Kabale district have surpassed or are quickly surpassing the point beyond which subsistence through agricultural production on available lands is tenable, given the district's relatively smaller land area, higher overall population density and growth rate, and resultant smaller household land holdings. As such, achieving and maintaining food security and nutrition among these populations will require a concerted shift for some of the population out of subsistence agricultural production as a primary livelihood activity, and toward other stable on- and off-farm labour opportunities. To be successful, however, efforts to facilitate such a shift must also consider the importance of providing training opportunities in the short-term to build a knowledgeable workforce and educational opportunities in the medium- and longer-term to sustain this work force. Efforts should also build in mechanisms to ensure that, as with Amuru district, such shifts in livelihood patterns do not result in a further increase in women's workloads.
- Interventions to address the food-related factors influencing persistent malnutrition among children in these areas must directly address women's heavy workloads and resultant lack of time to adequately undertake food production and food preparation activities. Addressing food availability and access issues without also addressing women's time and competing household responsibilities will not result in sustainable improvements in child nutritional status and may lead to overall decreases in this development indicator.
- Despite the fairly rigidly ascribed roles of men and women around agricultural production, marketing, and household management in the study areas, the data indicate that men and women tend to engage in active, collaborative communication and planning, in an effort to maximise the resources available to them to achieve and maintain household food security and adequate nutrition.

4.2 Implications of Findings for Programming and Recommendations

The study findings indicate that a range of intersectoral efforts is needed to enable households in the study areas to meet their food security and nutrition needs. The findings also suggest that the strategies to meet these needs will be somewhat different in each district. Key implications of the study findings and related recommendations for these two districts follow.

4.2.1 Improving Household Food Security and Nutrition: District-Specific Considerations

In Amuru district, most households remain dependent on agriculture to meet their food needs. The population in Amuru district is less dense than in Kabale, and land for farming remains relatively more available and arable. Undertaking daily wage labour or other income-generating activities is a strategy typically employed only in times of food shortage, or when the unexpected need for

additional income arises. The study findings indicate that greater investment in improved farming technologies is likely to have a more significant impact on food access and food-related aspects of utilisation/consumption (the potential for higher yields) in Amuru district. Providing men and women with additional stable income sources and/or subsidies to access capital, inputs, tractors, oxen, other technology, and transportation will assist farmers in optimising production from their land and addressing key food access issues that impact food utilisation/consumption.

In contrast, in Kabale district, while men and women aspire to be farmers, many are no longer able to access enough land on which to subsist, and must engage in other income-earning opportunities. As such, different approaches will be needed to improve household food access) and food-based nutrition in the district. That is, while some investment in improved farming practices to increase agricultural production in Kabale district might be useful, in isolation it will bring very little benefit to most families, given the extent of land scarcity and the inability of households to acquire more land. As a result, a regional approach to increase and expand employment, training, and skills-building opportunities will be essential in this area.

An interesting finding in both districts is that study informants referred to accessing land in terms of ‘individual’ ownership, purchasing, or renting. This trend is a shift from past practices of communally holding land, and informants in this study did not acknowledge the potential role of the community in maintaining land for farming. Given the increasing scarcity of land quality and quantity across Uganda, and, in particular for this study, in Kabale district, promoting community social networks to protect and promote land management practices may also assist in protecting and promoting household food security.

Recommendations Specific to Kabale District

- Expand access to off-farm income-earning opportunities that also meaningfully consider the division of labour within the household and women’s time constraints and that provide women and men with equal pay.
- Provide training and skills-building opportunities to men and women to help them become engaged actors in their local economy beyond their agricultural contributions.

Recommendations Specific to Amuru District

- Expand access to subsidised farming inputs, such as capital, technology, livestock, and transportation.
- Expand use of improved farming methods and technologies.
- Ensure that interventions meaningfully consider the division of labour within the household and, in particular, women’s time constraints.

4.2.2 Improving Food Access in Terms of Production and Purchase: Broad Findings

Among farmers who have access to larger tracts of land (particularly those in Amuru district), there is a need for investment in improved farming practices (e.g., ploughing using animal traction or tractors, increased access to/use of improved seed varieties). This investment should, in tandem, incorporate natural resource management practices to mitigate the impacts of climate variability and population growth on farm yields, as climate variability and decreasing soil fertility undermined crop yields in both study areas. Additional stable income-generating activities or subsidised access to farming capital to allow for improved access to necessary inputs is also needed.

Among farmers with access to little or no land in both districts, there is a need for stable alternative income-earning opportunities that permit these populations to regularly earn a living wage to be able to meet household food security needs.

As the district-specific recommendations imply, policy guidance and interventions are also needed to ensure employment opportunities and fair wages for both men and women, particularly in Kabale district, where casual on- and off-farm labour is more common. At the national level, it is important to identify policy and programmatic approaches to reduce the impact of high retail food prices in the study areas (e.g., by promoting natural resource management). Greater investment is also needed to expand access to family planning services in both districts, as the study findings show that population growth is adversely affecting household food security and nutrition.

Recommendations to Improve Food Production and Purchase

- Expand access to family planning services.
- Create an enabling policy and programme environment that mitigates and protects against the effects of climate change (e.g., introduction of crop insurance mechanisms, continued development and enhanced distribution of improved seed varieties) and promotes natural resource management (e.g., encouraging composting and/or other practices to retain topsoil and naturally enhance soil fertility).
- Invest in and disseminate farming technologies that improve crop yields and protect the environment to mitigate against the impacts of increasing climate variability (e.g., encourage use of shorter-cycle crops, rain catchments, terracing).
- Improve soil fertility by, for example, subsidising access to key inputs such as fertilisers or encouraging composting.
- Increase efforts to comprehensively train men and women farmers in improved farming and post-harvest methods.
- Expand access to safe and secure post-harvest storage options.
- Provide men and women farmers with increased access to farming resources, including capital, technology, transportation, improved seeds, and other inputs.

4.2.3 Improving the Household Food Basket

In addition to the need to increase the amount of food and income available from production and to stabilise the availability of income from other sources, the most significant need related directly to the household food basket is development of and support for the use of labour-saving technologies to free up women's time to prepare diverse foods for their families. In both districts, women's lack of time was a major constraint for food preparation and other household and child care activities. Some investment is also required to provide women and their families with the convenience of accessing diverse, high-quality, ready-to-use complementary foods to support women's efforts to feed children under 2 years of age frequently enough to meet dietary requirements of food quantity and diversity. Investment is also needed to improve access to alternative fuel sources and safe water to reduce women's time burden in their daily search for these inputs.

Recommendations to Improve the Household Food Basket

- Invest in labour-saving technologies for women and identify other ways to free up women's time so that they are able to provide optimal child care and dedicate adequate time for food preparation. Examples include expanding access and use of fuel-efficient, environment-friendly cook stoves, and encouraging development of small-scale cooperatives that assemble and market at accessible prices key elements needed to prepare evening meals, such as meal ingredients, firewood, and potable water.
- Invest in strategies to increase access to alternative fuel and safe water sources.
- Identify and invest in approaches to prepare and make available at low cost locally prepared complementary foods that are nutrient dense to meet the needs of children 6–24 months.
- Promote male involvement in supporting maternal and child nutrition.

4.3 Recommendations Regarding Topics for Further Study

The specificity of the conceptual and analytic approach used in this study implies that there are several complementary lines of analysis that could be useful to enhance and/or otherwise triangulate the findings and recommendations outlined in this document. Potential topics of study to further illuminate the linkages between agricultural production, food security, and nutrition outcomes include:

- The evolution to the current market value chains in the study areas and the impact of these changes on the agricultural production, food security, and nutrition of their inhabitants
- Constraints to household knowledge and/or implementation of key health and nutrition-related behaviours (e.g., sanitation and hygiene, child care practices)
- Changes in land tenure policy and practice, such as increasing trends in buying local land, and their impacts on agricultural production, food security, and nutrition
- An exploration of the linkages between agriculture and the non–food-related factors (e.g., care practices, access to essential services) influencing nutrition outcomes among smallholder farmers
- A comparative exploration of the linkages between agriculture and the food– and non–food-related factors influencing nutrition outcomes among commercial farming populations

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