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Leveraging Agriculture for Nutrition in East Africa (LANEA)

Country Report – UGANDA



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ACRONYMS

BMI	Body Mass Index
CAADP	Comprehensive Africa Agriculture Development Programme
CBO	Community-Based Organization
CDO	Community Development Officer
DSIP	Development Strategy and Investment Plan
EPRC	Economic Policy Research Center
GAFSP	Global Agriculture and Food Security Program
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
LANEA	Leveraging Agriculture for Nutrition in East Africa
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MoES	Ministry of Education and Sports
MoF	Ministry of Finance, Planning and Economic Development
MoGLSD	Ministry of Gender, Labour and Social Development
MoH	Ministry of Health
NAAS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
NDP	National Development Plan
NGO	Non-Governmental Organization
OFSP	Orange-fleshed Sweet Potatoes
P4P	Purchase for Progress
RCT	Randomized Controlled Trials
REACH	Renewed Efforts against Child Hunger and Undernutrition
RWANU	Resilience through Wealth, Agriculture and Nutrition in Karamoja
SUN	Scaling Up Nutrition movement
TANDI	Tackling the Agriculture-Nutrition Disconnect in India
UBOS	Uganda Bureau of Statistics
UCCO-SUN	Uganda Civil Society Coalition on Scaling Up Nutrition
UDHS	Uganda Demographic and Health Survey
UFNP	Uganda Food and Nutrition Policy
UFNS	Uganda Food and Nutrition Strategy/National Food and Nutrition Strategy
UNAP	Uganda Nutrition Action Plan
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
USAID	United States Agency for International Development
UNFFE	Ugandan National Farmers' Federation
WAZ	Weight-for-age Z Score
WFP	World Food Programme
ZARDI	Zonal Agriculture Research and Development Institutes

EXECUTIVE SUMMARY

Leveraging Agriculture for Nutrition in East Africa (LANEA) is an IFPRI/FAO research initiative carried out in Uganda, Kenya and Ethiopia to investigate opportunities and challenges related to scaling up impact on nutrition through the food and agriculture sector. The study took place from October 2013 to July 2014 and included a structured evidence review, key informant interviews and a stakeholder validation workshop. Information gained from this study deepens the evidence base on how to create and sustain an enabling environment for nutrition within agricultural policy and programmes. The study initiative was organized around three core domains that are key to influencing change: politics and governance, knowledge and evidence, and capacity and financial resources (Gillespie *et al.*, 2013).

Uganda, a member of the SUN movement since 2011, is currently putting a strong emphasis on poverty reduction and economic development, and the agriculture sector is a major contributor to the country's growth. Malnutrition rates - especially stunting - are high, with large disparities between urban and rural areas. Overweight and obesity are also a growing problem, particularly in urban areas. With 66 percent of households engaged in agriculture and 81 percent living in rural areas, the food and agriculture sector has potential to improve food and nutrition security across Uganda. The LANEA Uganda study highlights stakeholder perspectives on how agriculture can be leveraged to achieve improvements in nutrition.

Key Findings

Politics and Governance

Uganda's policy environment has great potential for addressing nutrition multisectorally. The country's National Development Plan (NDP) 2010/11 - 2014/15 addresses nutrition under the health and agriculture development thematic areas, taking an integrated approach and describing cross-sector responsibilities. The Uganda Nutrition Action Plan (UNAP) 2011- 2016 and the Agriculture Sector Development Strategy and Investment Plan (DSIP) 2010/11 - 2014/15 also have potential to take a multisectoral, integrated approach to addressing malnutrition. However, stakeholders and interview respondents in this study stressed the need for stronger coordination and collaboration for nutrition at both national and district levels, observing that sectoral policies are not often shared between sectors and that competition for resources can be a barrier to cross-sector initiatives.

Stakeholders provided their perspectives on international and domestic pressure as factors that can influence policy-making on agriculture-nutrition integration. On an international level, donors, global initiatives such as CAADP and the SUN movement, and research evidence such as the Cost of Hunger in Africa: Uganda Chapter and the Lancet Series provide impetus for policies that leverage agriculture for nutrition. On a domestic level, social pressure, as well as food prices and market forces, are perceived to influence policy-making. Additionally, opportunities for cross-sector dialogue, training courses for ministry officials that clearly frame problems and solutions and create awareness, and the availability of accurate and timely data were all seen as influential for decision-making and policy development.

With different mandates on nutrition between the agriculture and health sectors, one barrier to integrating agriculture and nutrition includes the lack of a monitoring and evaluation framework and indicators that can be used for measuring agriculture's impact on nutrition. Another challenge for policy implementation and governance is that nutrition is not seen as politically appealing because of its lack of visibility and tangibility.

Knowledge and Evidence

Stakeholders participating in the LANEA study reported a general lack of knowledge on how to take action for nutrition through agriculture, and the need for a stronger understanding of nutrition in order to gain leadership commitment. At the same time, their own thoughts and perspectives on how agriculture can impact nutrition indicate a growing awareness of links between these sectors. They referenced pathways such as diversifying crop production for better dietary diversity; women's empowerment and decreasing burdens on women's time as well as improving child care and women's access to resources; improving post-harvest practices such as food processing, safety and storage; and addressing social and cultural practices that have negative impacts on nutrition.

To back up the stakeholder perspectives, the evidence review also indicated a lack of strong research support for agriculture-nutrition linkages in Uganda. Seven studies were identified, and were mapped to four of the six agriculture-nutrition pathways described in the evidence review. The strongest findings were from two RCTs studying the impact of biofortified orange-fleshed sweet potato on vitamin A status among women and children. In another study, urban agriculture was found to improve dietary diversity, and livestock ownership was associated with higher household food security. A study related to women's employment in agriculture found that profits from women's sorghum beer production contributed to household nutrient intake; however, another study on women smallholder coffee production did not find increased food security at the household level despite women's greater control over household decision-making.

While these studies contribute to the knowledge base in Uganda, stakeholders opine that research is insufficiently disseminated and further investment in integrated research is needed. They also point to the need to contextualize research to the local environment and understand regional differences in the pathways - what works in one region may not work in another, and there is a need to understand the factors behind adoption and market demand in order to design appropriate cross-sector interventions. Further gaps in evidence and knowledge relate to the need for harmonization of agriculture and health data collection on food security and nutrition, especially at regional and district levels.

In terms of programming, many ideas were shared on how to make agriculture nutrition-sensitive, and several of these are included in the recommendations below. Stakeholders also felt that, in general, agricultural programmes can miss opportunities to improve nutrition; for example, by focusing on market production at the expense of crop/dietary diversity and nutritious crops. Agricultural projects also need to be aware of placing burdens on caregivers' time and increasing pressure on land use.

Capacity and Financial Resources

The LANEA study looked at capacity at individual, community, organizational and structural levels, as well as the sufficiency of financial resources for agriculture-nutrition integration. Overall capacity was seen as lacking in terms of human resources. Stakeholders indicated a need for high-level advocates, as well as more staff at all levels - including within the Office of the Prime Minister (OPM) - to work on multisectoral nutrition coordination, programmes and research. Capacity development is needed from building farmers' knowledge of diverse cropping systems to building policy-makers' knowledge to shape policy on nutrition and agriculture.

The educational system is seen as key to building basic knowledge on nutrition through school curricula, and incorporating nutrition training at universities, especially for agricultural students and professionals. Health centre and field-level staff need training, tools and capacity development on nutrition; and nutritionists need practical training on how to put their knowledge into action, including through integrated programming. Another point raised by workshop participants is the need for capacity to include a gender-sensitive lens on nutrition integration.

Financial resources for nutrition are inadequate across all sectors, including within the OPM and at district levels. Stakeholders agreed that while integrated frameworks exist, the funding to implement these plans does not. Capacity is needed not only to identify funding, but also to harmonize resources and decrease competition while increasing knowledge-sharing across sectors and improving accountability mechanisms and monitoring and evaluation to demonstrate impact.

Study Recommendations

Based on the study interviews and stakeholder workshop discussions, as well as the gaps identified through the literature review, a number of recommendations for how to move forward on integrating nutrition and agriculture in Uganda has been identified.

Politics and Governance

- 1.** Identify leaders and advocates for agriculture-nutrition integration who can coordinate the operationalization of UNAP and nutrition integration in the DSIP and other integrated nutrition initiatives.
- 2.** Support development of a common set of indicators for monitoring and evaluation of agriculture-nutrition integration, including a mechanism for accountability.
- 3.** Strengthen nutrition working groups, networks, nutrition units (in MoH and MAAIF), and provide opportunities for dialogue leading to knowledge-sharing.
- 4.** Mitigate potential negative consequences on nutrition from agricultural projects.
- 5.** Harmonize messages given to households by agricultural extension and health field workers.
- 6.** Harmonize agriculture and health data collection, improving accuracy and timeliness.
- 7.** Improve land tenure, particularly for women.
- 8.** Provide incentives to increase motivation for multisectoral work.

Knowledge and Evidence

9. Increase support for research on agriculture-nutrition pathways, ensure research and recommendations are contextualized to regional differences and disseminated to relevant groups.
10. Use research results and evidence base to design demand-driven interventions, taking into consideration household adoption and risk.
11. Build knowledge for behaviour change communication and education, understanding cultural and social practices on nutrition.
12. Learn from other countries, districts with good models, and other initiatives like those on HIV and AIDS.

Capacity and Financial Resources

13. Increase funding for nutrition, and implement existing nutrition frameworks and plans.
14. Train government officials as well as NGOs on nutrition integration.
15. Provide support for district nutrition coordination mechanisms, including data collection, analysis, and financial and technical coordination capacity.
16. Scale up numbers of field workers and address the challenges they face in reaching households, increase training and scale up use of available tools and resources.
17. Scale up nutrition education, include nutrition as a basic science in the school curriculum.
18. Build and strengthen public-private partnerships, and use the private sector to promote capacity-building (extension) and dietary diversity, not just commodity crops.
19. Build capacity to use social marketing to create demand for nutritious products/crops.
20. Include a gender-sensitive lens for nutrition integration.

1. INTRODUCTION

Background and Rationale

There is a growing acknowledgement that “nutrition-sensitive” multisectoral approaches that complement “nutrition-specific” interventions are needed to achieve progress in reducing undernutrition. The food and agriculture sector is central to achieving this progress, and it has potential to contribute much more to nutritional improvement than it has to date (Ruel and Alderman, 2013). However, not enough is known about how this impact can be achieved. To create an enabling environment for agriculture-nutrition integration, we need quality evaluations of the nutritional impact of agricultural programmes and interventions (Ruel and Alderman, 2013), as well as more knowledge about the political, institutional and capacity-related challenges that need to be addressed to link agriculture and nutrition at all levels.

Leveraging Agriculture for Nutrition in East Africa (LANEA) is a research study based in Ethiopia, Kenya and Uganda that addresses this need for knowledge of the enabling environment necessary to impact nutrition through the food and agriculture sector. The LANEA study documents efforts, describes challenges and identifies opportunities to scale up the food and agriculture sector’s contributions to improving nutrition. These three countries are members of the Scaling Up Nutrition (SUN) movement.

The LANEA study took place from October 2013 to July 2014 and included two main parts: a systematic literature review aligning research studies to six agriculture-nutrition pathways, completed in January 2014 for all three countries; and qualitative research based on one-to-one interviews and workshops with key stakeholders working in nutrition and agriculture in each country.

Following a detailed review of the nutrition-relevant policy literature in the fourth paper of the Lancet series (Gillespie *et al.*, 2013), three core domains were identified as key to generating change: politics and governance; knowledge, perceptions and evidence; and capacity and resources (Box 1). Drawing on these domains, this study explores stakeholder perceptions of nutrition-agriculture linkages; political and institutional challenges and opportunities; evidence that is available, needed, and influential for policy-making; and key issues with regard to capacity development to scale up nutrition in the food and agriculture sector.

Box1: Core domains for impact on nutrition through the food and agriculture sector

1. **Political context and institutional structures** affecting agriculture-nutrition linkages
[Policy, politics, governance]
2. **Knowledge, perceptions and evidence** of linkages between agriculture and nutrition
[Evidence, data, perceptions]
3. **Capacity and financial resources** needed to impact nutrition through the food and agriculture system

Source: Gillespie *et al.*, *Leveraging Agriculture for Nutrition in South Asia and East Africa: Examining the enabling environment through stakeholder perceptions*

LANEA Uganda Methodology

The LANEA Uganda study included a systematic literature review conducted in January 2014, interviews with key informants completed from March to April 2014, and a consultative workshop held on 28 May 2014.

The literature review compiled evidence from Uganda relating to the agriculture-nutrition pathways described by Gillespie *et al.* (2012) in their work on the TANDI initiative (Tackling the Agriculture-Nutrition Disconnect in India). Detailed methodology and discussion is described in Section 3. Findings from the literature review were shared during the consultative workshop.

The interviews and workshop were designed to elicit stakeholder perspectives on agriculture-nutrition linkages. The Uganda Nutrition Action Plan 2011-2016 (UNAP) describes a list of 56 key nutrition partners in the country, including civil society, government, development partners, private sector and research/academic institutions. From the UNAP membership list, 28 partners involved in agriculture and nutrition were chosen through purposive sampling to explicitly select stakeholders who were likely to generate useful, appropriate and in-depth data. The final number of respondents (19) was subject to their availability. A list of the institutions represented can be found in Annex A.

The interviews were open-ended and semi-structured, using an interview guide that was divided into the three dimensions of an enabling environment to leveraging agriculture for nutrition: (a) political context and institutional structures, (b) evidence and knowledge base, and (c) capacity and financial resources. The LANEA interview guide (Annex B) was adapted from that used by the Leveraging Agriculture for Nutrition in South Asia (LANSA) consortium in order to permit cross-regional comparisons and exchanges. All of the interviews were audio-recorded and transcribed. Interview transcripts were analysed using a stakeholder grid that included categories related to the three core domains for impact mentioned in Box 1.

The consultation workshop, to which the respondents and others on the long-list were invited, was held on 28 May 2014, with 21 stakeholders participating (Annex A). The workshop was used to validate the findings of the literature review and the stakeholder interviews and to generate further insights on agriculture's role for improved nutrition. Detailed notes were taken at the workshop and, together with the interviews, they provide diverse perspectives from across sectors and institutions, contributing to this report and to the knowledge base on agriculture and nutrition integration in Uganda.

This report draws together the results from this research in order to identify constraints and opportunities to scale up the nutritional outcomes of investments in the food and agriculture sector and contribute to our understanding of agriculture-nutrition pathways in Uganda.

2. FOOD AND NUTRITION SECURITY SITUATION

Food Security and Economic Development in Uganda

Uganda is currently putting a strong emphasis on poverty reduction and economic development, with national development strategies such as Vision 2040 and its related National Development Plan, which aspire to move the country towards middle-income status. Uganda is an economic hub for neighbouring countries, and had an annual Gross Domestic Product (GDP) growth rate of 6.5 percent for 2013 (CAADP, 2013; World Bank, 2014). The country has also made progress in reducing poverty, with the poverty headcount at national poverty lines at 24.5 percent in 2009, compared to 38.8 percent in 2002 (World Bank, 2014). Uganda boasts a number of natural resources, and according to the CAADP Nutrition Country Paper (CAADP, 2013), primary sectors for growth include “agriculture, forestry, manufacturing, tourism, mining, and oil and gas”.

While progress has been made on a number of levels, Uganda still faces challenges to ensuring food security and reducing poverty for all of its citizens. The United Nations Development Programme’s (UNDP’s) multidimensional poverty index finds 51.1 percent of the population in poverty (UNDP 2014). Uganda’s Human Development Index value, at 0.484, is also below the average for sub-Saharan Africa (0.502) (UNDP, 2014). Disparities also exist, with rural households facing more food insecurity than those in urban areas (CAADP, 2013). Table 2 presents a few of the indicators showing the status of food security and poverty in Uganda.

Despite the high numbers of households depending on agriculture for their livelihood In Uganda, 66 percent of households are net buyers of food and rely on the market for over 25 percent of the value of the food they consume, even in rural areas, where households buy more food than they sell (IFPRI, 2008). Households are therefore sensitive to price increases, which have occurred since 2006, and have had an impact on household food security.

Table 1 Poverty and Development Indicators, Uganda

Indicator	Uganda Data
GDP growth rate (2013) ^a	6.5%
GNI per capita, US\$ (2013) ^a	510
Population living below the national poverty line (2009) ^a	24.5%
Human Development Index score (2013) ^b	0.484
Human Development Index ranking (2013) ^b	45.6 out of 100
Global Food Security Index score (2014) ^c	89 out of 109 countries
Global Food Security Index ranking (2014) ^c	74 out of 109 countries

Source: a) World Bank data; b) UNDP 2014 Human Development Report; c) GFSI 2013

Agriculture in Uganda

Agriculture is a major contributor to Uganda's growth, accounting for 22.2 percent of the 2012 GDP (UBOS, 2013). Eighty-one percent of Uganda's population lives in rural areas, with 66 percent of all households in Uganda engaged in agriculture (UBOS, 2013).

Smallholder farmers make up 96 percent of all farm production (GAFSP, 2014), and crop production varies by region and includes maize, sweet potatoes, cassava, banana, beans and groundnuts. Cash crops produced include coffee, tea, cotton and tobacco, and livestock includes poultry, goats, cattle, sheep and pigs (UBOS, 2013).

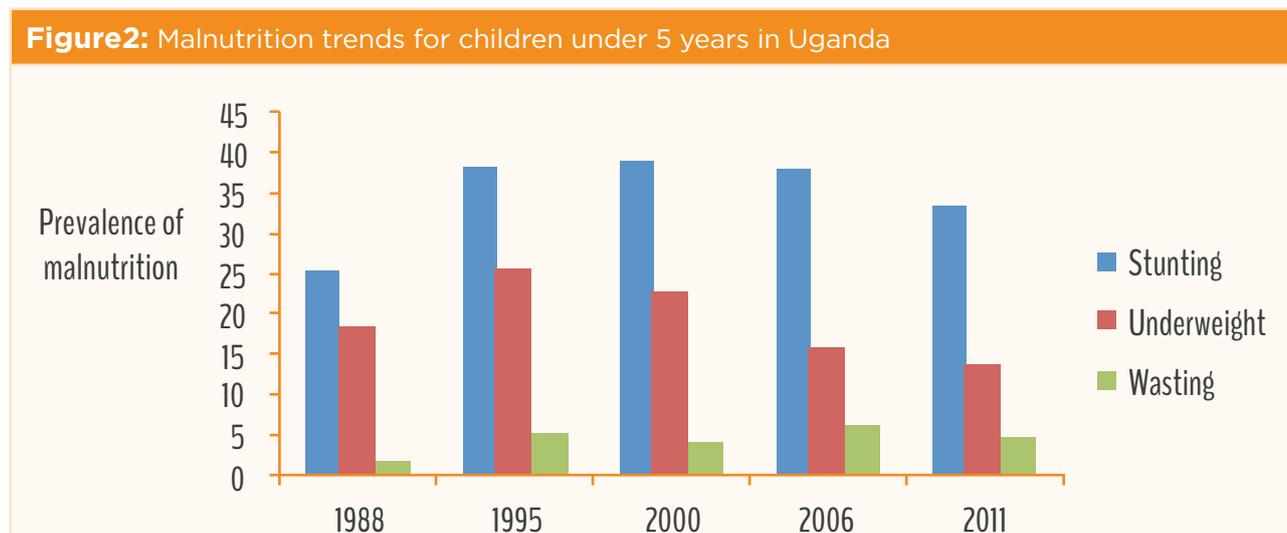
The Agriculture Sector Development Strategy and Investment Plan 2010/11 - 2014/15 (DSIP) identifies a number of issues constraining agricultural productivity: these include declining soil fertility, impacts of climate change, pressure from pests and diseases, and low use of agricultural inputs. Additionally, productivity in the agriculture sector has been declining, with growth in agricultural output decreasing from 7.9 percent in 2000/01 to 3.2 percent in 2011/12, falling short of meeting the 6 percent target set by African governments through the CAADP (DSIP, 2010).

Nutrition in Uganda

While nutrition indicators in Uganda have improved slightly over the last twenty years (Figure 2), investing in agricultural production and growth has not necessarily translated into improved nutrition, especially for women and children in rural areas. The 2011 Uganda Demographic and Health Survey (UDHS) found that stunting among children under five years of age was 33 percent, with large disparities between rural (35.6 percent) and urban (8.6 percent) children.

Wasting among children under five years has been reduced slightly to 5 percent in 2011, and underweight affects 14 percent of children under five, while 10.2 percent of infants are born with a low birth weight. According to 2006 data, 12 percent of women are considered to be underweight (UDHS, 2011). Micronutrient deficiencies are also an issue in Uganda. The CAADP Nutrition Country Paper (CAADP, 2013) and the Uganda Nutrition Situation Analysis (FANTA-2, 2010) describe vitamin A and iron deficiency as significant problems.

These reports also point to a growing "double burden" of malnutrition, with undernutrition existing together with problems of overweight and obesity. The latter is a problem particularly in urban areas where 34 percent of women are overweight or obese, compared to 13 percent in rural areas (CAADP, 2013).



Source: UDHS, 2011

Strategies and policy networks for nutrition and agriculture in Uganda

Uganda’s policy environment for addressing nutrition through agriculture has been gaining momentum. Uganda joined the Scaling Up Nutrition (SUN) Movement in 2011. The country has developed a number of policies and networks that have the potential to impact nutrition through the food and agriculture sector, several of which are described here.

As described above, Vision 2040 is Uganda’s long-term development strategy and the National Development Plan 2010/11 - 2014/15 (NDP) is the 5-year strategic planning framework for development priorities and strategies. In the NDP, nutrition falls under the thematic areas of both health and agricultural development. Nutrition is clearly identified in the NDP as a multidimensional issue requiring an integrated approach that involves numerous government ministries including the Ministry of Health (MoH) and the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF), together with non-governmental organizations (NGO), community-based organizations (CBOs), universities and the private sector.

The Agriculture Sector Development Strategy and Investment Plan (DSIP) is the implementation tool for agricultural development as outlined in the NDP. The development of the DSIP was guided by the principles and targets of the CAADP. The DSIP highlights nutrition under its strategies to sustainably end hunger through food production and food security, and while it is not a multisectoral document, it has potential to more fully address nutrition.

Recognizing nutrition as a cross-cutting issue, a multisectoral effort was undertaken to provide a framework for addressing food and nutrition issues in the country with the passing of the Uganda Food and Nutrition Policy (UFNP) in 2003 (RoU, 2003), followed by the Food and Nutrition Strategy (UFNS) in 2005. The UNFP promotes the nutritional status of Ugandans through multisectoral interventions and guided the design of the UFNS, which has an overall objective to provide a roadmap for the UFNP, or an “agenda of action” to address hunger and malnutrition in Uganda (RoU, 2005).

The Uganda Nutrition Action Plan (UNAP) was approved in 2011 to address the nutritional needs of young children and women of reproductive age in conjunction with Uganda's joining of the SUN movement. It calls for "*scaling up multi-sectoral interventions*" (RoU, 2011) and is a 5-year operational guide for the UFNP. Coordination of the UNAP has been strategically located within the Office of the Prime Minister (OPM) and is implemented using a multisectoral approach that cuts across all relevant sectors.

A number of relevant networks and stakeholder groups are listed in Box 2. These groups provide fora for working across sectors to impact nutrition, including a committee at the government level, a private sector group, as well as networks intended to provide technical support for efforts to scale up nutrition.

Box2: Uganda's policies and networks with potential to impact agriculture-nutrition linkages

Policies and strategies

Vision 2040 (2013)
National Development Plan (2010)
National Agriculture Policy (2014)
Uganda Food and Nutrition Policy (2003)
Uganda Food and Nutrition Strategy (2010)
Uganda Nutrition Action Plan (2011)

Networks

Multisectoral Technical Coordination Committee (government ministries)
Uganda Civil Society Coalition on Scaling up Nutrition (UCCO-SUN)
United Nations Technical Working Group (TWG) on nutrition
Private Sector Foundation Uganda (PSFU)

Source: SUN Movement: <http://scalingupnutrition.org/sun-countries/uganda/progress-impact>

3. LANEA UGANDA LITERATURE REVIEW:

Mapping the evidence of agriculture-nutrition pathways

Overview and Methodology

This systematic review was undertaken in January 2014 to find evidence of the linkages between agriculture and nutrition in Uganda. The search covered fifteen databases, websites and references from bibliographies, combining search terms related to food, nutrition and agriculture, and identifying both published and grey literature.

All references were entered into Mendeley referencing software and duplicates, irrelevant or inaccessible studies were removed. The search yielded a total of 431 citations, which were reduced to seven articles through an elimination process. These seven articles were then rated according to quality criteria and mapped to one or more of the six key pathways between agriculture and nutrition (see Box 3). The sequence of steps is illustrated in Figure 1.

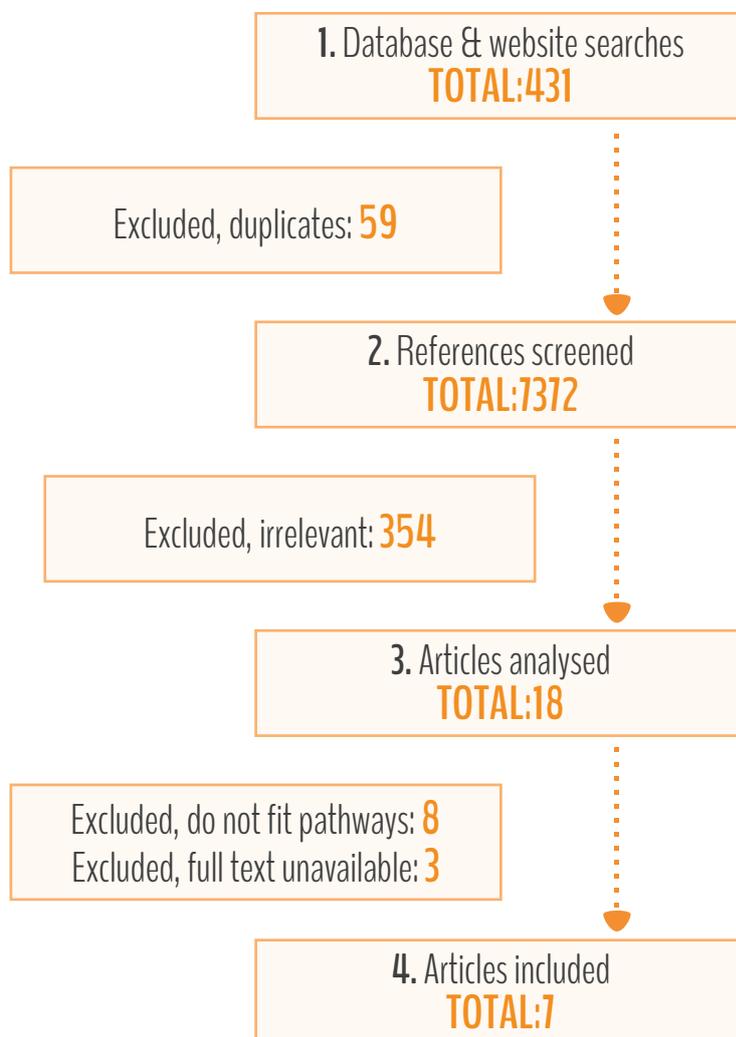
Studies included were full text articles in published or grey literature linking nutrition to elements of agriculture in Uganda. Studies that were excluded were opinion pieces or conceptual papers and those that did not measure nutrition outcomes or relate elements of agriculture to nutrition outcomes, as well as those that could not be accessed electronically despite searches in a number of search engines. Articles were categorized according to study design, and quality assessment was based on factors such as appropriateness and rigour, internal and external validity, reliability and cogency, with gradings of high, medium and low quality (DFID, 2013)

“Agriculture” was defined in broad terms to encompass agri-food systems and policies. Measures of nutrition outcomes/status included anthropometry, total calorie intake, diet quality, nutrient consumption, nutrient deficiencies, consumption of specific food commodities, nutrition knowledge and nutrition-related practices.

Box3: Agriculture-nutrition pathways

1. **Agriculture as a source of food:** Farmers produce for own consumption.
2. **Agriculture as a source of income for food and non-food expenditures:** As a major direct and indirect source of rural income, agriculture influences diets and other nutrition-relevant expenditures.
3. **Agricultural policy and food prices:** Agricultural conditions can change the relative prices and affordability of specific foods, and foods in general.
4. **Women in agriculture and intra-household decision-making and resource allocation** may be influenced by agricultural activities and assets, which in turn influence intra-household allocations of food, health and care.
5. **Maternal employment in agriculture and child care and feeding:** A mother’s ability to manage child care may be influenced by her engagement in agriculture.
6. **Women in agriculture and maternal nutrition and health status:** Maternal nutritional status may be compromised by the often arduous and hazardous conditions of agricultural labour, which may in turn influence child nutrition outcomes.

Figure 3. LANEA study inclusion pathway



Results by agriculture-nutrition pathway

After applying the method described in the LANEA study inclusion pathway (Figure 1), seven articles were included in the evidence review. Although there were only half the number of studies found in the evidence mapping for Uganda compared to evidence for the other LANEA countries, the review did yield two randomized controlled trials (the gold standard for evidence) for Uganda.

The review found that most pathways were supported by very few studies, and two pathways had no research support in Uganda (Table 2). There was no evidence for pathway 3 - how agriculture policy and food prices affect food consumption - or for pathway 6 - linking women’s employment in agriculture and its effect on maternal nutrition and health status. The findings relating to each of the other pathways are described below.

Table 2: Number of studies included in the evidence review by pathways and study design

Pathway	Numbers of studies
1: Agriculture as a source of food	6
2: Agriculture as a source of income for food and non-food expenditure	2
3: Agriculture policy and food prices affecting food consumption	0
4: Women in agriculture and intra-household decision-making and resource allocation	2
5: Female employment in agriculture and child care and feeding	1
6: Women in agriculture and women's nutritional and health status	0
Study Design	
Randomized controlled trials	2
Quasi-experimental studies	0
Observational studies using analytical methods such as multivariate regressions and econometric modelling	3
Mixed method studies (involving quantitative & qualitative studies)	2

*Some studies are included in more than one pathway, therefore the total exceeds 7.

Pathway 1: Agriculture as a source of food

Agriculture----own production----household access to calories/micronutrients----individual intake----nutrition outcome

Six out of the seven studies in this review investigated the association between agricultural production or homestead food production and household nutrition, measured in either calories or micronutrients. Two studies (Hotz *et al.*, 2012; Brauw *et al.*, 2013), both high-quality, randomized controlled trials (RCT), researched the association between adoption of orange-fleshed sweet potatoes (OFSP) and nutrition outcomes. Agricultural interventions such as biofortification (breeding staple food crops to be a dense source of essential micronutrients) contribute to dietary diversity and addressing deficiencies such as vitamin A. An RCT to evaluate the outcome of two large-scale intervention programmes found that the introduction of OFSP to Ugandan farming households increased vitamin A intake among children and women and was associated with improved vitamin A status among children (Hotz *et al.*, 2012). A comparison of RCTs in Uganda and Mozambique (Brauw *et al.*, 2013) found that substantial gains in vitamin A intakes can primarily be attributed to consumption of OFSP, rather than nutrition knowledge, although evidence suggests that nutrition training played a small role in the impact of vitamin A consumption.

A further study (Ulimwengu *et al.*, 2011) explored the impact of various micronutrients (in addition to caloric intake) on agricultural productivity, revealing the bidirectional effect between productivity and nutrients' intake. More productive farmers tended to consume more nutrients and vice versa, with results showing the significant effect of nutrient consumption (particularly vitamins B12, B6 and protein) on labour productivity.

The importance of beer products (both beer and dregs) as a key food source and a value chain addition from sorghum cultivation was highlighted in a small study that investigated changes in the dietary intake of agropastoral families in Karamoja due to sorghum beer commercialization (Dancause *et al.*, 2010).

Urban agriculture is a potentially important source of dietary diversity for city dwellers, as confirmed in two studies of urban farmers in Kampala (Yeudall *et al.*, 2007; Maxwell *et al.*, 1998). Yeudall *et al.* found that children from families that did not raise livestock (whether or not they also grew crops) had a significantly lower average dietary diversity score than children from families that raised livestock, after controlling for age and sex. Household food security was significantly correlated to the number of livestock, dietary diversity and weight-for-age (WAZ). Anthropometric variables did not differ significantly between families that did and did not grow crops. An older study (Maxwell *et al.*, 1998) demonstrated higher nutritional status (particularly height-for-age) in children under five of urban farming households in Kampala compared to non-farming households, after controlling for individual child, maternal and household characteristics.

Pathway 2: Agriculture as a source of income for food and non-food expenditure

Agriculture----income (poverty)----food and non-food expenditures----household nutrient availability----individual nutrient intake----other nutrition-relevant goods and services---- nutrition outcome

Two studies (Dancause *et al.*, 2010) were concerned with this pathway, looking at how agriculture contributes to the incomes of poor people and how that in turn influences nutrition outcomes, through both food and non-food expenditure. Sorghum beer production influenced the nutritional intake of Karimojong women and children both directly through consumption of beer dregs (dregs, left over from beer production, are an important source of energy and amino acids in these households, though lacking in many nutrients) and through food purchased with profits from sales. Nutrient intake was highest among women with direct access to agricultural production (in this case, sorghum) who sold beer from their homesteads, and lowest among women who lacked sorghum intake and worked for commercial brewers in urban centres. Although the social and health effects of beer commercialization were not described as entirely positive, the authors concluded that it currently offered the best strategy for women to provide for their families.

Kanyamurwa *et al.* (2013) employed mixed methods (quantitative and qualitative) to determine the differential returns between women smallholder coffee and food producers in rural Uganda. Despite greater land and livestock ownership, greater access to inputs and higher levels of income and a wider variety of markets than food producers, coffee producers had to work longer hours to obtain these economic returns, and spent more cash on health care and food from commercial sources. Their health outcomes were similar to those of the food producers, but with poorer dietary outcomes and greater food insecurity. Researchers were not able to measure child nutritional status in this study.

Pathway 3: Agriculture policy and food prices affecting food consumption

Supply & demand factors (policies, taste, prices) ----relative prices of various food items---- household calories/micronutrients----individual intake----nutrition outcome

There were no studies found for this pathway.

Pathway 4: Women in agriculture and intra-household decision-making and resource allocation

Agriculture----women in agriculture----women's decision-making power----intra-household resource allocation----nutrition outcome

Two studies examined factors linking female empowerment and intra-household decision-making to improved nutrition outcomes. A comparison of two groups of smallholder women farmers (Kanyamurwa *et al.*, 2013) found coffee producers to have significantly more control over spending decisions on food than food producers, although this did not translate into better dietary outcomes or increased food security at the household level. Beer had become the ‘cattle of women’ in Dancause *et al.*'s study (2010) of sorghum beer commercialization among Karamoja households, redistributing wealth from men to women since men form the majority of customers. The foods commonly purchased with profits from beer sales contributed greatly to household nutrient intake. However, the study's authors identified potential issues in that women's brewing is sometimes taken over by men or restricted and out-competed when it becomes lucrative. Since Karimojong women are responsible for their children's nutrition, and since beer sales were identified as the best way to earn income to provide for basic daily needs, losing control of this resource could have very real health consequences.

Pathway 5: Female employment in agriculture and child care and feeding

Agriculture----(female) employment----caring capacity/practice----nutrition outcome

One study (Maxwell *et al.*, 1998) probed this pathway, researching the impact of female employment in agriculture on maternal caring capacity and nutrition and health outcomes. Women interviewed in case studies claimed that farming (in this instance, urban agriculture in Kampala) enabled them to provide more direct care of their children compared to other kinds of informal work. However, multivariate analysis did not confirm a significant association between maternal time spent on child care and height for age (Maxwell *et al.*, 1998).

Pathway 6: Women in agriculture and women's nutritional and health status

Women in agriculture----energy expenditure----female adult BMI

There were no studies found for this pathway.

Conclusion

There was a dearth of evidence for all six pathways linking agriculture and nutrition in Uganda, although all of the seven papers identified were of high- to medium-quality and included two RCTs (a research design not found in the other two LANEA countries). No evidence was found for two pathways (pathway 3: how agriculture policy and food prices affect food consumption, and pathway 6: linking women's employment in agriculture and its effect on maternal nutrition and health status).

The studies reviewed nevertheless reveal interesting findings pertaining to factors affecting pathways between agriculture and nutrition, such as the following:

- biofortified crops, such as OFSP, have been found to be associated with improved Vitamin A status among women and children in RCTs.
- Urban agriculture (in Kampala) is a potentially important source of dietary diversity, but livestock ownership rather than crop production is associated with higher household food security.
- Conflicting studies on women employed in agriculture show a link between female empowerment and intra-household decision-making and improved nutrition outcomes; smallholder coffee producers had more control over spending decisions on food than food producers but this did not lead to increased food security at household level. However, food purchased by Karamoja women from their profits from sorghum beer production made a wider contribution to household nutrient intake.

This evidence review suggests an urgent need for research into further information on all six pathways to better inform policy-makers on how to design and implement nutrition-sensitive agriculture programmes in Uganda.

4. LANEA UGANDA INTERVIEW AND WORKSHOP FINDINGS - POLITICS, EVIDENCE AND CAPACITY

As previously described, interviews and a consultative workshop were carried out with key stakeholders from a diverse set of institutions to gain perspectives on the challenges and opportunities for agriculture-nutrition integration in Uganda. The findings from these interviews and the workshop have been classified into the three major areas of impact for creating an enabling environment to address nutrition through agriculture: **1)** the political context of agriculture-nutrition linkages; **2)** knowledge and evidence for agriculture-nutrition linkages; and **3)** capacity and financial resources to carry out agriculture-nutrition linkages. These key areas form the basis of the following discussion.

Political Context of Agriculture-Nutrition Linkages

This section describes interview and workshop stakeholder perspectives on the challenges and constraints to prioritizing nutrition within the food and agriculture sector. It also describes participants' perceptions of the current momentum to scale up nutrition through agriculture and the factors seen as key to influencing policy and the enabling environment for integrating nutrition into agriculture policy and programmes.

The main government ministries, departments and agencies (MDAs), responsible for, or involved in leveraging agriculture for nutrition outcomes are MAAIF, MoH, Gender, Labour and Social Development (MoGLSD), the Ministry of Education and Sports (MoES), and the Ministry of Finance, Planning and Economic Development (MFPED). Stakeholders also described the Office of the Prime Minister (OPM) as a key public sector player, as it is responsible for leadership and coordination of the UNAP. Respondents cited donors, UN agencies, NGOs, research institutions and the private sector as also having potential to impact agriculture-nutrition policies.

Challenges and constraints to considering nutrition in the food and agriculture sector

Stakeholders described numerous challenges and constraints to integrating nutrition in the food and agriculture sector. These ranged from issues at national policy level, to challenges at district, community and household level.

One challenge brought up by numerous stakeholders, including government and NGO participants, is that sector mandates dictate actions, and the agriculture sector's mandate is to improve production rather than to address nutrition. MAAIF respondents said that agriculture is commodity-oriented, and does not traditionally incorporate nutrition. A stakeholder from the OPM said that "*household nutrition is neglected [by] market-oriented agricultural production*". A respondent from REACH described how agriculture is focused on income and production rather than nutrition, pointing to the production of crops for alcohol rather than for food.

As well as sectors working within their own areas, workshop participants and respondents pointed to the lack of coordination for nutrition and competition for resources between sectors. An NGO respondent said: *“the current administrative structure encourages silo programming and competition”*, adding that there is a lack of motivation for collaboration. A UN agency respondent said that this lack of coordination exists at both national and district levels. A stakeholder from the UCCO-SUN said that sectoral policies are not shared between sectors. Stakeholders also described multisectoral coordination to be challenging due to competition for limited funding. Another government stakeholder advised that coordination, particularly at the district level, is lacking, but also offered the perspective that multisectoral coordination structures are improving gradually.

A number of study participants expressed the view that the invisible nature of nutrition makes it challenging to address. An MAAIF respondent said that nutrition is not politically appealing, contrasting nutrition to building a school, which is tangible and thus garners political support. Several other stakeholders from nutrition advocacy networks described the invisibility of nutrition as a reason for its neglect. An NGO respondent reflected that *“by the time [malnutrition] is visible, it is extreme”*, yet motivating policy-making for nutrition is a challenge in that one cannot immediately see the results of investments in nutrition.

Another constraint to considering nutrition in the food and agriculture sector cited by participants is the lack of knowledge on how to take action and measure the impacts. A public sector stakeholder said that the commitment to addressing nutrition exists, but translating that commitment into action is where the gap lies. Similarly, a civil society participant said: *“Policy decisions made are very far from reality...because of that, writing them and translating them into practical actions remains a very big challenge”*. Another participant from the MAAIF pointed to the lack of knowledge on how to integrate nutrition into value chain programmes that are the focus of the DSIP. A UN agency participant described a gap in knowledge related to monitoring and evaluation indicators, while workshop participants discussed the need for an effective monitoring and evaluation system and accountability. A UCCO-SUN participant said that research is not shared and knowledge management is needed to get information to those who need it, and even when research is available, people do not always seek out and read the study reports.

Participants also pointed to the lack of trained professionals across sectors as a serious constraint to scaling up efforts to address nutrition through agriculture, both in terms of numbers of workers on the ground and in terms of capacity and training. NGO and government stakeholders voiced this when speaking about agriculture extension workers, community health workers, academic institutions, and national and district/local government personnel. An NGO participant cited the lack of funds for nutrition within the MAAIF as another constraint, and workshop participants and others echoed this view.

Current momentum and enabling environment for scaling up nutrition through agriculture

Despite these challenges and constraints, participants described positive momentum for scaling up nutrition through agriculture in Uganda. When asked about how nutrition is considered in the food and agriculture sector and the actions currently being taken in scaling up, study participants expressed a number of ideas suggesting a growing enabling environment for nutrition.

At the policy level, study participants from across institutions described Uganda's commitment to joining the SUN movement and adopting related policies as evidence of its commitment to address nutrition. A UN agency participant pointed out that Uganda was an "early riser" to adopt the SUN strategy, and that the UNAP "customizes" the SUN approach to the Ugandan context. Donor and government stakeholders emphasized the multisectoral nature of the UNAP and the fact that it clearly links agriculture and nutrition and benefits from "synergies" between these sectors. According to a participant from the MAAIF, the agriculture sector is "one of the lead sectors for implementing food and nutrition interventions in the country", and the agriculture sector's DSIP prioritizes household food and nutrition security together with its focus on increasing productivity and income of smallholder farmers. Other government participants highlighted the government's involvement with CAADP, and CAADP's inclusion of nutrition-sensitive initiatives. However, another MAAIF participant was more cautious regarding agriculture's integration of nutrition, saying that the DSIP has "a small chapter concerning food and nutrition, perhaps for the sake of making the CAADP people happy".

Stakeholders also described the various committees and working groups being established as further evidence of the growing momentum to address nutrition. Participants from the MoH and MAAIF both highlighted the creation of nutrition units within their ministries, and many participants discussed the role of the OPM in coordinating, guiding policy development and mobilizing resources for nutrition. MAAIF, REACH, and NGO participants described the establishment of nutrition coordination committees at the district level, though one respondent cautioned that it will take some time for these committees to be fully functional. Such efforts indicate a move towards an enabling environment for scaling up nutrition; however, workshop participants also suggested the need to establish intra-departmental working groups to oversee programme implementation and monitor progress towards nutrition indicators.

Study participants also recognized the contributions of various individuals to promoting an enabling environment for scaling up nutrition, with several participants pointing to the Prime Minister as a nutrition champion.

Regarding action on the ground, stakeholders described a variety of projects and research related to agriculture and nutrition integration that demonstrate the current momentum to link these sectors (Table 4). These ranged from the United Nations World Food Programme's (WFP) community-based school feeding programmes, to HarvestPlus' research on biofortification, to the development of materials to train agriculture extension workers on integrating nutrition into their work with farmers.

Table 3 Programmes cited by stakeholders as examples of the current momentum and enabling environment for nutrition-sensitive agriculture

Agency/ Organization	Programme Activities
MAAIF and partners	Zonal Agriculture Research and Development Institutes (ZARDI): contributing to sustainable agricultural productivity, competitiveness, economic growth, food and nutrition security. Commodity zoning approach envisages promotion of fruits, vegetables, dairy, fish and staple foods.
MAAIF and private sector	National Agricultural Advisory Services (NAADS): promoting food security and nutrition together with improving productivity and incomes.
Global Agriculture and Food Security Program (GASFP)	Funding provided to the Government of Uganda to support efforts to link agriculture, nutrition, health and education; nutrition-sensitive agriculture best practices including gardening, building capacity of extension and advocacy ¹ .
IFPRI, HarvestPlus, Uganda National Agriculture Research Organization (NARO)	Research on biofortified crops: high-vitamin A orange-fleshed sweet potato, iron-rich beans, quality protein maize (QPM).
Makerere University	Economic Policy Research Center (EPRC) conducting research on nutrition, food science and technology, influencing policy on multisectoral approaches to nutrition; School of Public Health (SPH) projects related to nutrition.
WFP	Purchase for Progress (P4P) supporting smallholder farmers' access to markets and improved production and post-harvest practices, school feeding programmes.
FHI360	Community Connector Project (USAID-funded Feed the Future project) uses integrated agriculture and nutrition interventions to address malnutrition among women and children, building capacity of local governments, private sector, CBOs and farmers to improve nutrition.
Concern Worldwide, ACDI/VOCA, Welthungerhilfe	Resilience through Wealth, Agriculture and Nutrition in Karamoja (RWANU) integrated livelihoods, health and nutrition programme. Uses mothers' care groups and farmers' field schools to improve nutrition and food security.
World Vision	Work at community level assisting communities with extension services, access to markets, building credit and savings practices, and empowering women with livelihood opportunities.

Source: Interview transcripts and programme websites

¹Note: while the funding is approved, the project is yet to be finalized for implementation at the time this report goes to press.

Factors influencing policy-making for agriculture-nutrition integration

Study participants were asked about influential factors to the current momentum to scale up nutrition through agriculture in policy environments, as well as the motivations that they see driving policy-makers. They shared diverse perspectives relating to international and national pressures and factors influencing policy actions.

Several respondents described the impact of the international community on policy decisions. They mentioned global initiatives such as the SUN movement as influencing Uganda's policy and decision-making. UN agency and government stakeholders highlighted the importance of the *Lancet* series in pushing the agriculture-nutrition agenda forward. Respondents and workshop participants also described the *Cost of Hunger in Uganda* report (UNECA, 2013) as influential for its role in providing evidence and defining malnutrition's impact on the national economy and calling for action from across sectors.

Another factor perceived as influential for policy-making was that of donor interests. Participants from government ministries and civil society shared the perspective that financial resources drive actions and decisions on nutrition. A donor agency itself mentioned the role of donors in pushing for policy-making that integrates nutrition and agriculture, while a civil society organization stated: *"policies are driven by donors...and money influences decision-making...if there is no donor who is interested in a particular policy, you will sit bragging however relevant it is"*.

Domestic pressure also influences policy, with UN agency and civil society participants pointing to politics and social pressure as influential over decisions and strategies. An MAAIF respondent pointed to the importance of *"advocacy, information exchange, and enabling cross-sector dialogue for nutrition"* as key to influencing policy decisions. A donor agency described similar influences, saying that discussions, meetings and networks provide key information for decision-making. An MoES participant suggested that past policies influence present policy decisions. Furthermore, a UN respondent pointed to food prices and market forces as factors in policy-making; these could be domestic or global issues.

Efforts to build knowledge were also perceived to influence policy. A UCCO-SUN participant described training provided to ministry officials as being important for creating awareness on nutrition-sensitive agriculture that will lead to advocacy and policy decisions. He described the events at the National Nutrition Forum, where civil society organizations demonstrated the impact of their nutrition-sensitive programmes, impressing the Prime Minister and leading to advocacy and *"political will"* at top levels of the Government. A respondent from the private sector suggested that in order to influence policy, one must be *"smart and strategic"* in *"framing the problem"* and showing how your efforts will lead to *"change that [the policy-maker] wants to see"*.

Along with these factors, several civil society stakeholders suggested that community mobilization and involvement from district and local levels is also important to policy-making. They said that empowering people to request nutrition-sensitive approaches and have *"local platforms for people to remain vocal"* on these issues is key. One of these participants suggested that action research, which is participatory in nature, is important to provide input to decision-makers.

Other stakeholders, including those from the workshop, the OPM, MAAIF, and a donor agency, also said that research is an important factor for policy-making. An MAAIF participant claimed that “*evidence-based advocacy*” is important, particularly research evidence from Uganda. A participant from the Uganda Bureau of Statistics (UBOS) said that “*accurate and timely data influence a lot of decision-making and policy*”, while a respondent from the OPM added that reports from researchers and from civil society NGOs as well as UDHS data can all play a role in influencing decision-making.

Knowledge and Evidence

This section focuses on stakeholder perceptions of the current knowledge and evidence base for agriculture-nutrition pathways in Uganda. We describe perceptions on how agriculture can become more nutrition-sensitive, potential negative consequences that agriculture may have on nutrition outcomes, as well as participants’ thoughts on the gaps and evidence needed to scale up nutrition through agriculture, and how to translate this knowledge and evidence into useful action.

Knowledge and perceptions of agriculture-nutrition pathways

The study asked participants about their knowledge of pathways linking agriculture to nutrition, and their responses relate to many of the agriculture-nutrition pathways described in the literature review in Section 3. Several participants shared perspectives on the direct linkage between nutrition and agriculture, with an MAAIF respondent stating this best, in that agriculture’s main objective is to “*produce food to feed the world...and eating is not for the sake of it, it is for making the world well nourished*”.

Many study participants from across institutions described the connections between agriculture and nutrition as occurring through the “*production to home consumption*” pathway and the “*production to market to income pathway*” (pathways 1 and 2 above). MAAIF stakeholders described the importance of nutrient provision through foods cultivated and consumed by households. However, REACH participants pointed out that even in rural areas, households do not meet food needs by production alone, and income is key to meeting food and nutrition-related needs.

Participants also reflected that simply increasing production or income is not sufficient to impact nutrition. According to a participant from the OPM, other important factors include behaviour change communication (BCC) and education on food utilization and preparation, as well as addressing social and cultural practices that are detrimental to nutrition. A UBOS participant pointed to the need to “*start with crop diversification*”, saying that the major crops produced are “*not sufficient to meet nutrient needs*”. This was echoed by several other civil society participants who brought up the importance of both dietary diversity and biodiversity for nutrition. Workshop participants said that “*food security*” crops need to be promoted together with cash crops.

Over half the respondents from across sectors and institutions stressed the importance of gender and women’s empowerment pathways, with an MAAIF participant describing gender as “*a very important bridge*” between agriculture and nutrition. Pathways involving gender included decreasing burdens on women’s time and improving child care through labour-saving technology as well as increasing women’s access to resources, including

land, seeds and inputs. Several participants suggested that when women gain access to and control over higher incomes, they use the income for food, while men use such income on alcohol and other non-essential purchases. Other participants raised the issue that women and children's nutritional outcomes are negatively impacted by the unequal intra-household distribution of food.

Workshop and interview participants mentioned other important factors related to pathways from agriculture to nutrition such as the importance of food safety; improving food processing, post-harvest practices and storage; and scaling up biofortification. A donor agency respondent pointed out that pathways and interventions to impact nutrition through agriculture depend in part on regional differences: some regions have food available but lack education on food utilization, while other regions have an absence of food and limited land. This would make some pathways and interventions more relevant than others depending on the region. Workshop participants also said that in order to effectively impact nutrition, the agriculture sector must address regional, seasonal and gender disparities in vulnerability to malnutrition.

Making agriculture nutrition-sensitive

When asked for their perspectives on ways in which agriculture can become more nutrition-sensitive, participants had a number of thoughts ranging from policy-level approaches to civil society and private sector approaches involving practices across the food value chain.

In terms of policy approaches, several study participants, including workshop stakeholders, discussed the need to further include nutrition concerns in the DSIP and to make the role of agriculture for nutrition more explicit in both the DSIP and UNAP. An OPM participant said that the agriculture sector ought to include dietary diversity in its policy approach, while an NGO participant said that nutrition actions are needed that fall "*within the agriculture sector's mandate*". Participants from REACH and an NGO discussed the policy issues towards land tenure and its potential impact on nutrition, one highlighting the need for women to have ownership and inheritance rights, and another stating that the majority of farmers who are working to ensure food availability for the country have never been registered for their land and need assurance of land tenure. On a different note, an NGO respondent suggested that providing agricultural subsidies could make foods more affordable.

Multiple stakeholders from health and agriculture ministries, donor agencies and NGOs emphasized the role of agriculture extension and Community Development Officers (CDOs) in making agriculture nutrition-sensitive. Government participants said that agriculture extension could reinforce nutrition messages and educate farmers on the utilization of diverse crops and livestock for nutrition. Two MAAIF respondents mentioned a draft manual on community nutrition for agriculture extension workers that includes behaviour change messages related to improving nutrition. An MoGLSD respondent also referred to the National Handbook for Community Development Officers and Stakeholders in Community Development Work (MoGLSD, 2013) that is nutrition-oriented. He said: "*In most cases where they have used CDOs...the projects have been successful*", as they come from the community and can "mobilize and prepare people".

Two participants suggested that farmer field schools can be used for improving nutrition, with an NGO stakeholder describing that farmers can share information about farm management as well as nutrition and food preparation. Another NGO participant said that school and demonstration gardens can play a positive role in improving nutrition, as well as programmes that support farmers in storing their crops after harvest until prices are favourable, such as community food banks and bulking centres.

Participants from across sectors and institutions identified other ways in which farm and food systems could be made more nutrition-sensitive, including strengthening post-harvest and processing technologies so that farmers do not lose produce and save time on activities such as grinding and milling. Scaling up production and promotion of iron-rich beans and OFSP and investing in more research on these and other biofortified crops and technologies was also perceived by stakeholders, including workshop participants, as a key way for agriculture to improve nutrition. Several respondents also highlighted animal husbandry and poultry farming as being particularly nutrition-sensitive. Along with crop and livestock production, respondents from a UN agency, civil society and the private sector described improving farmer access to markets and stronger market infrastructure as a factor in promoting linkages between agricultural production and utilization.

Respondents and workshop participants pointed to the private sector's key role in many of these pathways, while a donor participant mentioned the need to strengthen public-private partnerships. Workshop attendees recommended prioritizing the involvement of the agricultural private sector in improving nutrition, suggesting the use of a social marketing perspective and demand creation for nutritious foods. Community partnerships were also described as important, with an MoGLSD respondent describing the need to engage communities in “*dialogue*” and “*brainstorming*” solutions, “*being sensitive to cultural values that people have practised for many years*”.

Perspectives on potential negative consequences of food and agricultural policies and programmes

While the food and agriculture sector has the potential to improve nutrition, study participants also suggested several ways in which agricultural policies and programmes have had negative consequences on nutrition outcomes.

MoH and NGO participants shared the perspective that by placing burdens on caregivers' time, agricultural programmes can negatively impact child nutrition, while one NGO respondent described the large demands already on women to bring food to the table, from farm production to food preparation. Another perspective from a district-level government stakeholder was that food distribution programmes have not been effective at solving hunger; he believed that in some areas these programmes have actually triggered more pregnancies as households attempt to qualify for free food distribution.

Study participants from the government and an NGO also suggested that the market-orientation of agricultural programmes could harm nutritional outcomes or miss opportunities to improve nutrition. For example, an MAAIF respondent said that “*the zoning approach [to agricultural development] has disregarded nutritious crops*”, and a donor agency related that some regions have a high prevalence of malnutrition despite

being major food producers, indicating a missing link between agriculture and nutrition outcomes. Workshop participants also said that commodity zoning should be targeted more clearly towards fostering crop and dietary diversity. An MoGLSD participant reiterated that increasing income through farm productivity does not always translate into the purchase of nutritious foods. An NGO participant said that promoting market production has increased pressure on land use, while a government stakeholder pointed out that many rural households do not own land or have very small land holdings, suggesting that agricultural programmes have a limited reach to the most vulnerable. A private sector respondent reiterated that some interventions have increased the cost of farming by “*increasing import duties and taxes on agricultural inputs*”, resulting in “*higher prices for nutrient-rich foods*”.

Gaps and evidence needed for scaling up nutrition through agriculture

When asked about the sufficiency of knowledge and evidence on scaling up nutrition through agriculture, study participants described a number of gaps related to programme design, indicators, data and research, with particular emphasis on the lack of linkages between agriculture and health data collection.

An MAAIF participant said that further evidence is needed to input into programme design for nutrition-sensitive agriculture interventions, and another MAAIF participant added that research needs to be “*contextualized to the local environment*”. Workshop participants said that needs assessments are necessary to understand community needs and to allow community demand to drive interventions. They also discussed the need to understand adoption and market demand for nutritious products like OFSP.

A UCCO-SUN participant said that the research culture is not yet well developed in Uganda, both to produce and to use research. Participants reported that the limited evidence base on nutrition-sensitive approaches makes it difficult for agriculture, health and other relevant programmes to take account of their potential impact on nutrition. An MoGLSD participant claimed that “*indicators are still poor despite investments in agriculture, education and health*”, and workshop participants pointed to the need for a common monitoring and evaluation plan with a common set of indicators. Workshop attendees recommended that studies and projects be designed so that meaningful data and knowledge can be generated. They agreed that this requires further investments in research, evaluation, learning and data management that is capable of integrating information from agriculture, health and nutrition.

Numerous stakeholders said that programme staff and policy-makers rely on UDHS data, but this comes out only every two years and focuses mainly on health indicators rather than integrated agriculture and nutrition outcomes. Several participants agreed that national statistics - both agricultural and health-related - are not always accurate or reliable. An MAAIF stakeholder said that data is also needed at regional and district levels in order to see progress.

A further challenge is that agriculture and health sectors are collecting data on their own and do not typically work together. An MAAIF stakeholder gave the example of food security early warning system data collection that is on-going every six months, which,

however, is not harmonized with the health sector. He suggested that food and nutrition monitoring systems are needed that are integrated, routinely collected and use improved technology. Others related similar issues regarding the lack of integrated data across sectors.

A UCCO-SUN stakeholder shared a different perspective: he said that the gap is not related to a lack of research or data, although more information would be useful, but rather in the availability and use of the data. He said that there is a knowledge base for agriculture-nutrition integration, but utilizing this information is the problem. Part of the gap he described lies in “*disseminating*” information: “*we cannot use [evidence] when we don’t know its existence...let it be disseminated, let it be shared...maybe the research culture is not developed*”. This perspective was discussed further during the stakeholder workshop, with attendees citing a need for a communicator and clear channels for information, and recognizing that much of the gap exists in operationalizing strategies and frameworks that are already in place. They recommended that in order to advocate for nutrition integration, research findings need to be clearly communicated to policy-makers, consumers and other stakeholders.

Incentives for translating knowledge and evidence into action

When asked about policy-makers’ incentives to use research and evidence in formulating policies and strategies, participants voiced several perspectives. A respondent from the OPM reflected that he is guided by the UNAP in his decisions. Other stakeholders described the incentives to address nutrition stemming from global initiatives, donor pressure, and research such as that provided by the 2008 and 2013 Lancet series. A participant from UBOS said: “*the use of research depends on the context in which it is presented*”, reflecting again on the need for clear dissemination of knowledge.

A donor agency respondent said that policy directives from donor governments incentivize the use of evidence. An NGO respondent pointed to the role of donor agencies in shaping her use of evidence in order to design programmes that would receive funding. Another civil society participant said that “*case studies and real life stories*” help to incentivize policy.

Stakeholders described common sources of new evidence on nutrition-sensitive agriculture including programme reports, policy documents, case studies, Internet resources, and international and national research in the public domain. Study respondents learn of new evidence through participation in sectoral coordination meetings, nutrition fora, sector work group meetings, conferences, and personal contacts and networks.

Capacity to Carry out Agriculture-Nutrition Linkages

This section describes stakeholder perceptions regarding the types of capacities required in Uganda in order for the food and agriculture sector to become more nutrition-sensitive. These capacities fall into four categories: individual, community, organizational and structural. While participants indicated an overall perception that capacity is needed at many levels, they also suggested areas in which capacity can be developed or currently exists.

Individual

Stakeholders described the need for more individuals to work on issues related to multisectoral nutrition coordination, programmes and research. Numerous stakeholders described the large capacity gap in terms of human resources, with one NGO participant pointing to the “*shortage of qualified personnel in agriculture and nutrition at every level: national, district and local communities*”. Participants from REACH reported that there is a lack of “sensitization” on nutrition such that “*people don’t know what nutrition is*”. They said that individual knowledge of nutrition should be built up through the education system, and that everyone in Uganda should have a basic knowledge of nutrition. Workshop participants agree that basic nutrition knowledge is necessary, and add that capacity-building for agricultural professionals at universities and agricultural colleges should include nutrition.

Individual capacity development is needed for those working at the field level in agriculture and nutrition. An OPM respondent said that health centre staff sometimes need basic skills training to carry out nutrition-related work, giving the example of seeing a staff member at a health clinic who did not know how to use the height board for child measurements. MAAIF and UBOS respondents also highlighted the need for capacity development of farmers, not only to give them knowledge to boost production, but also to advise them on diverse cropping systems relevant to different ecological zones and post-harvest practices to maintain nutrient values.

Individual capacities at government levels were also described as low, with an MAAIF stakeholder describing the need for human resources at all levels to address nutrition, and describing his office as “*overstretched*”. He said that sometimes there are good ideas but no staff to put them into action. He reflected that a diverse team of individuals working on nutrition issues would lead to more ideas and the ability to leverage resources. These ideas were also discussed during the stakeholder workshop, with participants saying that, while the nutrition secretariat in the OPM has significant capacity, advocates are needed to coordinate different groups and communicate information.

An advocacy organization participant described the need to build capacity of policy-makers, pointing out that it takes a certain skill-set to create and shape policy, and there is a need to develop people’s skills in this regard. She described a similar need for capacity development of nutritionists who, she says, often have academic preparation but lack the capacity to translate their knowledge into practical action.

Community

Many stakeholders described community-level capacity gaps, with particular emphasis on agriculture extension workers, village health teams (VHTs) and CDOs. REACH and UN participants said that it is hard to make an agriculture extension worker into a nutrition worker or change the mandates of these different community workers. Furthermore, a government stakeholder said that extension capacity is low, “*reaching less than 20 percent of farmers*”, and a UCCO-SUN participant advised that motivation among extensionists varies, and they face challenges covering large and hard-to-reach areas and may even be experiencing malnutrition within their own households.

An OPM participant said that field-level staff lack the capacity to integrate agriculture and nutrition messages and need training and tools in order to deliver integrated programmes. Workshop participants describe the need for these training materials to include nutrition in a gender-sensitive manner. Several stakeholders described existing capacity development tools, such as the National Handbook for Community Development Officers and Stakeholders in Community Development Work (MoGLSD, 2013), mentioned above, that includes training on food and nutrition. However, an NGO respondent said that agriculture extension training “needs to have nutrition components, not just production” while an MoES participant said the same for CDO training. They point out the need for facilitation to coordinate between these sectors to build capacity. This coordination is also needed to harmonize messaging between the various field workers to get the “right messages” to farmers and households to produce and consume “the right food”, according to a UN agency participant.

Stakeholders also say that behaviour change and educational materials used by field staff need to be scaled up. One effort to scale up nutrition capacity in the country is a nutrition comic book, which the MoES described is being developed by UNICEF and targets primary school students and their parents and communities. A suggestion by a REACH participant that was also brought up by workshop participants is to use religious leaders to advocate for nutrition within communities.

Organizational

A civil society participant described organizational capacity as lacking, saying that many organizations are trying to include nutrition in their programming due to the current momentum, but their capacity to integrate nutrition into their programmes is low in both service delivery and monitoring. An NGO participant described the need for further capacity development for agricultural programmes to understand how to be accountable for nutrition outcomes. She pointed out that NGOs are “still in the learning process” and this is a “fairly new arena for agriculture to be accountable for nutrition outcomes”. Related to the need for accountability mechanisms, an MAAIF participant said that a monitoring and evaluation system needs to be developed within the agriculture sector that includes nutrition indicators, and a UN participant said that community workers need a means to assess both nutritional status and the impact of farmers’ actions on nutrition.

At both organizational and systematic levels, a number of stakeholders from government and civil society and workshop participants perceived a need for further capacity development at district levels. A UCCO-SUN participant described the need for technical and financial capacity to address nutrition and make it a priority within districts and an NGO participant said that districts need capacity development to strengthen their decision-making power. Workshop participants said that there are sometimes problems with analysing and interpreting data at the district level, as well as a lack of financing for district-level nutrition plans. In general, coordination structures for providing oversight of nutrition efforts have not been implemented in all districts and further capacity and knowledge is needed to support such structures.

Structural

At the structural level, numerous stakeholders and workshop participants described the OPM as a leader in developing capacity to coordinate multisectoral approaches for nutrition. Several respondents see the development of the nutrition secretariat and the establishment of the OPM as a coordinating body for nutrition as paving the way for capacity-building and implementation of nutrition activities, reflecting that capacity is increasing at national levels. However, OPM respondents stressed the challenge of dealing with “competing responsibilities” and insufficient staff and time.

Workshop attendees, as well as MoGLSD and donor participants, said that further capacity is needed at the national level to work together and create multisectoral collaboration. An NGO participant believed that the OPM’s coordination role could result in less competition between sectors, increased accountability and monitoring and evaluation, and sharing of knowledge and experiences across sectors. One stakeholder from an NGO suggested that the multisectoral nutrition community could learn from the experiences of Uganda’s HIV and AIDS community. She said that the HIV and AIDS sector had good coordination and a champion in the country, pointing to the need for strong leadership to push the agriculture-nutrition agenda forward.

Another serious capacity gap raised by stakeholders is that of financial resources. Several participants mentioned the lack of budget allocation to nutrition even within the OPM, with one respondent saying: “*Staff have salaries, but no money to implement activities*”. A UCCO-SUN participant said that the plans to address nutrition within CAADP and DSIP frameworks exist, but the financial resources to put the plans into action do not. Budgeting is the challenge, and “*budget allocations by the government*” need to be “*consistent with the programme priorities*”, according to several stakeholders. They cite that nutrition is underfunded in all sectors.

Other stakeholders raised the issue of competition again, saying that competition for financial resources both within government sectors and between government and CSOs is another barrier to multisectoral collaboration. A donor agency described a need to “*tap into existing synergies*” and harmonize resources and accountability, and an OPM stakeholder questioned whether special budgets are necessary, wondering whether nutrition messaging can be added to agriculture budgets. However, an MAAIF participant said that producing training manuals is costly, and a UBOS respondent also stated that data is costly and it takes both time and money to run surveys and collect data. Workshop participants suggested that developing policy briefs helps to increase financing.

Others pointed out that funding currently exists for nutrition activities due to the global momentum pushing nutrition forward. A REACH participant described how the SUN movement is helping to mobilize resources, and an MFPED participant said that development partners, the private sector, academia and the government have currently invested financial resources. However, an NGO participant raised a concern regarding whether funding for nutrition will continue in Uganda once the current global momentum dies down, while another NGO participant voiced the perspective that activities that receive funding are implemented regardless of whether they have real potential impact or not.

5. CONCLUSION

Uganda's agriculture sector has a key role to play in addressing malnutrition, and has begun to take steps towards putting multisectoral plans in place to impact nutrition. Participants in the LANEA Uganda study gave many examples of this current momentum, stressing the high-level commitment to improving nutrition outcomes within the Government of Uganda. At the same time, they pointed to a number of gaps and areas that need to be strengthened in order to scale up nutrition through agriculture.

One of the main challenges described by stakeholders is the weakness in inter-and intra-coordination of sectors to address nutrition holistically. This coordination is needed in order to translate Uganda's nutrition commitments into action, and to operationalize the plans that are in place. Stakeholders put particular emphasis on the need to support and strengthen districts' ability to implement projects in agriculture that are nutrition-sensitive and operationalize Nutrition Coordination Committees at district level.

Human resource development is another challenge: participants stressed the need to improve staff capacity to work multisectorally to address nutrition, and to include nutrition in education and training. Together with capacity of staff working within the government ministries, participants highlighted the need for capacity development of civil society and the private sector in order to better promote nutrition concerns in agricultural interventions, programmes and approaches.

Interesting points were raised by stakeholders suggesting a central role for the private sector in developing nutrition products, adding value to food through fortification, investing in agro-inputs and social marketing approaches to behaviour change for nutrition. Communities have a role in contributing to consumption of more diversified and nutritionally-rich food, through improved home gardens and raising demand for nutrition-sensitive programmes. Furthermore, the importance of gender to many aspects of agriculture-nutrition integration was clear both from the interviews as well as from the literature review. Many participants agree that improving nutrition through agriculture requires empowering women and scaling up gender-oriented approaches to address gender inequality and the removal of gender disparities in the adoption of nutrition-sensitive agriculture.

Finally, it is clear from this study that further research and evidence on nutrition-sensitive agriculture along the value chain is necessary to input into both policies and programmes, along with stronger channels for evidence dissemination to those who need the information to form decisions. While the seven studies included in the literature review fill some knowledge gaps in terms of how agriculture can be leveraged for nutrition, further investments in research and programme evaluation are needed to increase the evidence base and feed into tools and strategies to leverage agriculture for nutrition in Uganda.

The following recommendations for leveraging agriculture for nutrition emerge from the stakeholder interviews and workshop discussions, as well as the gaps identified through the evidence review:

Politics and Governance

1. Identify leaders and advocates for agriculture-nutrition integration who can coordinate the operationalization of UNAP and nutrition integration in the DSIP and other similar nutrition initiatives.
2. Support development of a common set of indicators for monitoring and evaluation of agriculture-nutrition integration, including a mechanism for accountability.
3. Strengthen nutrition working groups, networks, nutrition units (in the MoH and MAAIF), and provide opportunities for dialogue leading to knowledge-sharing.
4. Mitigate potential negative consequences on nutrition from agricultural projects.
5. Harmonize messages given to households by agricultural and health extension field workers.
6. Harmonize agriculture and health data collection, improving accuracy and timeliness.
7. Improve land tenure, particularly for women.
8. Provide incentives to increase motivation for multisectoral work.

Knowledge and Evidence

9. Increase support for research on agriculture-nutrition pathways; ensure research and recommendations are contextualized to regional differences and disseminated to relevant groups
10. Use research results and evidence base to design demand-driven interventions, taking into consideration household adoption and risk.
11. Build knowledge for behaviour change communication and education, understanding cultural and social practices on nutrition.
12. Learn from other countries and districts with good models, and other initiatives like those on HIV and AIDS.

Capacity and Financial Resources

13. Increase funding for nutrition, and implement existing nutrition frameworks and plans.
14. Train government officials as well as NGOs on nutrition integration.
15. Provide support for district nutrition coordination mechanisms, including data collection, analysis, and financial and technical coordination capacity.
16. Scale up numbers of field workers and address the challenges they face in reaching households, increase training and scale up use of available tools and resources.
17. Scale up nutrition education, include nutrition as a basic science in the school curriculum.
18. Build and strengthen public-private partnerships, and use the private sector to promote not only the cultivation of commodity crops but also capacity-building (extension) and dietary diversity.
19. Build capacity to use social marketing to create demand for nutritious products/crops.
20. Include a gender-sensitive lens for nutrition integration.

ANNEXES

Annex A - Study participants

Stakeholder Interview Participants	
Government	Office of the Prime Minister (OPM) Ministry of Gender, Labour, and Social Development (MoGLSD) Ministry of Health (MoH) Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) Ministry of Finance, Planning and Economic Development (MFPED) Ministry of Education and Sports (MoES) Uganda Bureau of Statistics (UBOS)
United Nations	World Food Programme
Donor Agencies	USAID
Nutrition Networks	REACH UCCO-SUN
Civil Society	Private Sector Foundation Uganda

Stakeholder Consultation Workshop Participants	
Government	Ministry of Education and Sports Office of the Prime Minister
UN Agencies	WFP FAO REACH
Donors	USAID
Nutrition Networks	UCCO-SUN Uganda Action for Nutrition (UGAN) SPRING
Civil Society Organizations	Uganda Food Rights Alliance (FRA) FHI 360 (FANTA III) RECABIP (Regional Capacity Building Partners) Uganda National Farmers' Federation (UNFFE)
Research/Universities	IFPRI Kyambogo University
Private Sector	

Annex B - Programme for Consultation Workshop

Stakeholder Consultation
28 May 2014

Objectives

The main objective of the meeting is to disseminate the findings of research on the role of agriculture for improved nutrition in Uganda and generate national-level stakeholder's comments that will be incorporated in the revised draft.

Expected Output/Outcomes

Comments and inputs from the validation workshop will contribute to the revision of the report to be harmonized into the regional report.

Enhanced stakeholders' understanding on the role of agriculture for improved nutrition for policy actions, capacity building and research.

Preliminaries

- 8.00-8.30** Registration and Introduction of Participants
- Session I: Background and Climate Setting: 8.30-11.00 am** *Chair - FAO*
- 8.30-8.45** Opening Brief: *FAO Representative in Uganda*
Question & Answer session
- 9.00-9.15** Overview of leveraging agriculture for nutrition, some global perspectives:
Stuart Gillespie (IFPRI)
Question & Answer session
- 9.30-9.45** National evidence review of links between agriculture and nutrition:
Judith Hodge (IFPRI Consultant)
Question & Answer session
- 10.00-10.15** FAO perspectives on leveraging agriculture to improve nutrition
(FAO representative)
- 10.30** **Refreshment break**
- Session II: Role of Agriculture for Improved Nutrition in Uganda: 11.15-12.45 pm**
Chair - MAAIF
- 11.00-11.10** A brief on the stakeholder interviews – *Stuart Gillespie*
- 11.10-11.30** Presentation of findings from stakeholder interviews
Richard Semakula (IFPRI consultant)
• Plenary discussions & comments
- 12.30-1.30** **Lunch break**

Session III: Further Insights into Agriculture–Nutrition Linkages 1.30 –1.45 pm

Chair - OPM

1.45-2.00 Plenary discussions on global and key research priorities for Uganda on agriculture & nutrition- *led by Stuart Gillespie*

2.00-3.30 **Break out Group Sessions** to respond to the following questions:

- Are current agriculture policies responsive to nutrition?
- If not, what should be done?
- How should the capacity building for nutrition and agriculture be strengthened?
- How do we implement effective nutrition-sensitive interventions through agriculture?
- What are some current obstacles to effective implementation?
- Is there any ongoing or planned research for nutrition and agriculture that has not been captured in the evidence review?
- How have research studies been translated into policy and practice?
- What are the research gaps and priorities?

3.30 **Refreshment break**

4.00-4.45 **Report back from Group activities**

Concluding session/vote of thanks: *Chair ILRI*

4.45 Wrap Up and Way Forward - *IFPRI, FAO*

5.00 Vote of Thanks

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LANEA (Leveraging Agriculture for Nutrition in East Africa) is an IFPRI/FAO research initiative carried out in Ethiopia, Uganda and Kenya to investigate opportunities and challenges related to scaling up impact on nutrition through the food and agriculture sector. The study took place from October 2013 to July 2014 and included a structured evidence review, key informant interviews and a stakeholder workshop. Information gained from this study deepens the evidence base on how to create and sustain an enabling environment for nutrition within agricultural policy and programmes. This report presents the study findings for Uganda and proposes recommendations for enhancing agriculture's contribution to nutrition in the country.

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