MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES

GUIDELINES FOR INTEGRATING NUTRITION INTO AGRICULTURE ENTERPRISE MIXES

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Foreword

Malnutrition affects human capital development and productivity. Poor nutrition during the first 1,000 days (from pregnancy through a child's second birthday) can cause life long and irreversible damage, with consequences at the individual, community and national levels. Malnutrition is the underlying cause of as many as 45% of childhood deaths in Uganda (Cost of Hunger Report, 2012).

Under-nutrition among women greatly contributes to poor pregnancy outcomes and infant and maternal mortality and has negative consequences on productivity. Over-nutrition and micronutrient deficiency are also a source of concern given their contribution to the disease burden which in turn affects productivity. Against this background, the National Development Plan II (NDPII, 2015/16-2019/20) has recognized nutrition as a one of the cross cutting issues to be mainstreamed in sector development plans.

The overall objective of the National Agriculture Policy, 2013 is to promote national and household food and nutrition security and improved incomes. Given this policy direction, it implies that all investment plans in the sector should focus on ensuring improved nutrition status as well as incomes for the households.

The Ministry of Agriculture, Animal Industry and Fisheries has been promoting investment in strategic and other enterprises at zonal level with the aim of ensuring that farmers are able to earn daily, seasonal and annual incomes to boost their household incomes. The enterprises currently selected at zonal level fit within this broad, but overriding thinking.

Despite all the previous interventions by agriculture and other key sectors such as health, malnutrition still remains one of the serious health and economic problems facing Uganda. To ensure consumption of adequate and diversified foods, the process starts with agriculture

production and its attendant requirements and practices necessary to increase production and ensure household food security.

In this line, it is important for this to be put into consideration in the selection and promotion of combinations of enterprises for daily, seasonal and annual incomes. Thus, the Ministry's future direction in promoting enterprise combinations will be informed by income and food security as well as nutrition considerations. It was in this context that these guidelines have been developed.

These guidelines aim to direct agriculture extension and community development workers and their agents to support an enterprise mix development process that also considers nutrition. This has been made possible through the development of a set of principles that should be considered in the selection and promotion of zonal enterprise mixes that are nutrition sensitive.

I appeal to extension workers to make good use of these guidelines to facilitate farmer selection of enterprises that promise both financial and nutritional returns. In this way, they will greatly contribute towards reducing malnutrition and its attendant costs to the country's agricultural productivity and the whole economy.

For God and My Country

Hon. Vincent Bamulangaki Ssempijja (MP)
Minister of Agriculture, Animal Industry and Fisheries

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The Ministry appreciates all other individuals and organizations that have not been mentioned by name here but who, in one way or another had a hand in the development of these guidelines.

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Abbreviations and Acronyms

ASSP	Agriculture Sector Strategic Plan
CAADP	Comprehensive Africa Agriculture Development Program
DSIP	Development Strategy and Investment Plan
EAC	East African Community
FANTA	Food and Nutrition Technical Assistance
GDP	Gross Domestic Product
HIV/AIDS	human immunodeficiency virus/acquired immunodeficiency syndrome
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
OFSP	Orange Fleshed Sweet Potato
UGX	Ugandan shilling
UNAP	Uganda Nutrition Action Plan

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Agriculture and nutrition are so interrelated that attention needs to be paid to both if meaningful nutrition outcomes are to be realized. To promote the consumption of adequate and diversified foods, the process starts with improving agricultural production and household food security. However, increasing household food production does not necessarily lead to improved nutrition. It is difficult to discuss nutrition without bringing food production into the picture, though it is known that nutrition is also influenced by factors other than production.

The need for the agriculture sector, through its lead ministry, to actively participate in actions aimed at reducing malnutrition is premised on global, regional and national frameworks, notable among them, the Sustainable Development Goals, the 2001 New Partnership for Africa's Development (NEPAD), the 2002 Comprehensive Africa Agriculture Development Programme (CAADP), the 2015/16 – 2020 Agriculture Sector Strategy Plan (ASSP), and the 2011–2016 Uganda Nutrition Action Plan (UNAP).

A number of interventions have been undertaken in Uganda to realize the objectives of the above frameworks. Indeed, numerous stakeholders have invested in agricultural programs with the implicit intention of contributing to improvements in the nutritional status of the country's citizens. These efforts have included the following:

- Promotion of fish farming and fish consumption
- Promotion of fruit and vegetable production and consumption

- Promotion of household-level and other small-scale agro-processing, and consumption of processed products
- Promotion of consumption of a nutritious diet
- Promotion of home management
- Promotion of poultry production and consumption of poultry and poultry products (e.g., eggs)
- Training for local government officials on integrating nutrition, HIV/AIDS, and food security into work plans and routine activities
- Promotion of household food and income security interventions that follow the commodity approach[1]
- Promotion of research on bio-fortified food crops and food fortification
- Dissemination of bio-fortified crop varieties
- Promotion of research on food safety, including the production of atoxigenic strains of mould that can be used to limit aflatoxin contamination[2]
- Promotion of a food security information system
- Promotion of bylaws on food and nutrition

However, the integration of nutrition into all these interventions has not been well coordinated**.** Moreover, most of these efforts have focused on profitability, market orientation and income, as has the country's zonal/regional enterprise promotion strategy[3]. Indeed, a look at the criteria used to select zonal enterprises reveals that nutrition has been underplayed. While maintaining the key criteria for selecting such enterprises, it is important to guide the selection

[1] This means supporting the development of region-specific or zonal enterprises along the entire agricultural value chain.
[2] Aflatoxins most commonly occur in maize and groundnuts, can result in serious health problems and may be related to stunting in children.
[3] The zonal strategy indicates that regions with similar agro-ecological conditions should be encouraged to promote enterprises that are suited those specific areas.

process such that the combinations of enterprises reflect nutrition sensitivity.

1.2 Objectives of the Guidelines

The overall goal of these guidelines is to strengthen the contribution of agriculture interventions to improving household food and nutrition security. The guideline's objectives are to:

- Guide policymakers on the design of nutrition-sensitive policies, strategies and guidelines
- Provide a framework for enhancing assimilation of nutrition actions in the selection of agriculture enterprises, as well as promote nutrition-sensitive programs within the sector
- Guide agriculture extension and community development workers and agents in selecting enterprise combinations that are both highly profitable and nutrition sensitive

1.3 How to Use the Guidelines

The primary users of these guidelines are agriculture officers and their agents, as well as community development workers, all of whom have a critical role to play in guiding the enterprise selection process. The guidelines are primarily meant to guide farmers during the enterprise selection process to ensure that the selections address both income needs and nutrition requirements.

Technical officers are expected to refer to the criteria outlined in this guide to facilitate the selection of a mix of nutrition-sensitive enterprises from those recommended for the relevant agro-ecological zones. Alternatively, technical officers can use these guidelines to facilitate a discussion on the nutrition sensitivity of enterprises already selected by the district or community.

1.4 Justification for the Integration of Nutrition in Agriculture

1.4.1 Agriculture and the Ugandan Economy: Linkages to Nutrition

The agriculture sector remains the backbone of Uganda's economy and it is a source of livelihood for most of the population. It contributes to 72% of the total labour force and 25.3% of the country's gross domestic product (GDP), and it accounts for 54% of total export earnings[4]. In addition, about 66% of the country's working population is engaged in agriculture[5]. The proportion of women engaged in agriculture is 83%[6]. Women are thus significant contributors to household food security and nutrition, and they are also particularly adversely affected by food insecurity and malnutrition.

Agricultural growth leads to economic growth and poverty reduction, manifested as higher per capita GDP[7]. Higher per capita GDP is associated with increased expenditure on food and nutrition[8], which may help reduce malnutrition. Agriculture can also contribute to addressing malnutrition by ensuring that diverse, nutritious foods are available and accessible, either through the market or from home production. Generally, a well-nourished and healthy labour force is also critical for agricultural production.

[4] National Planning Authority. 2015. *Second National Development Plan 2015/16–2019/20*. Kampala: National Planning Authority of Uganda.
[5] Uganda Bureau of Statistics. 2012. *2012 Statistical Abstract.* Kampala: Uganda Bureau of Statistics.
[6] ibid
[7] Grehal, Bahjan, et al. 2012. *The Contribution of Agricultural Growth to Poverty Reduction*: ACIAR Impact Assessment Series Report No. 76. Canberra: Australian Centre for International Agricultural Research.
[8] Food and Agriculture Organization of the United Nations (FAO), World Food Programme (WFP) and the International Fund for Agricultural Development (IFAD). 2012. *The State of Food Insecurity in the World 2012. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition*. Rome: FAO.

Agriculture-nutrition linkages can occur in three scenarios.

SCENARIO ONE

- Increased food production (including production of nutrient-rich foods) leads to increased food consumption (assuming what is produced will, indeed, be consumed)
- Increased food consumption (including consumption of nutrient-rich foods) leads to increased nutrient intake
- Increased nutrient intake improves child and maternal nutrition

SCENARIO TWO

- Increased food production leads to increased incomes
- Part of the increased income is spent on food from the market (including nutrient-rich food)
- Consumption of food from the market (including nutrient-rich food) leads to increased nutrient intake
- Increased nutrient intake improves child and maternal nutrition

SCENARIO THREE

- Increased food production increases household incomes
- Part of the increased income from food sales can be spent on health care (assuming positive health-seeking behaviours are practiced)
- Increased expenditure on health care improves the health status of children and mothers
- Better health reduces the disease burden among children and mothers, malnutrition attributed to disease decreases, and nutritional status improves

It is clear, therefore, that agriculture and nutrition are interrelated, and there is a need to strengthen this mutually beneficial relationship. However, past efforts in the agriculture sector largely focused on farming from a business and market perspective and ignored household food security and nutrition considerations, in spite of the enabling environment provided through international, regional and national frameworks, policies, strategies and guidelines, including those that follow.

1.4.2 Food and Nutrition Policy Frameworks

Investments in food and nutrition are guided by national, global and regional policy frameworks, which provide an enabling environment for their implementation within various sectors. These policy frameworks at the same time provide an important justification for program implementers to emphasize policy issues in their design of strategies, projects and work plans.

Global and Regional Frameworks

The Millennium Development Goals and Sustainable Development Goals

Goal 1 of the United Nations Millennium Development Goal (1990–2015) was to reduce extreme hunger and poverty. With reference to hunger, the target was to halve the proportion of people who suffered from hunger, which would ultimately result in a reduction in underweight among children under 5 years of age, as well as a reduction in the proportion of the population consuming insufficient dietary energy. The need to reduce hunger has been re-echoed in the Sustainable Development Goals. In particular, Goal 2aims to end hunger, achieve food security, improve nutrition and promote sustainable agriculture.

New Partnership for Africa's Development (NEPAD) and Comprehensive Africa Agriculture Development Programme (CAADP)

In Africa, the fight against hunger has been articulated in NEPAD and CAADP. NEPAD aims to ensure that smallholder farmers—the majority

of Africans—get better access to markets, finance and technical support in order to improve their incomes and get out of poverty. Agricultural development on the continent is driven through NEPAD's CAADP, the objective of which is to raise agricultural productivity in Africa to at least 6% annually, to contribute to poverty alleviation and the elimination of hunger and food and nutrition insecurity.

East African Community (EAC) Food and Nutrition Security Policy 2014

The EAC Food and Nutrition Policy responds to current regional development and integration challenges in the EAC. It is aimed at achieving food and nutrition security in the region through the pursuit of appropriate policy measures that target factors that cause food and nutrition insecurity in the region.

National Frameworks

The National Food and Nutrition Policy

The overall goal of the Uganda Food and Nutrition Policy is to ensure food security and adequate nutrition for all people in Uganda, for their health as well as their social and economic well-being. The objective of the policy is to improve the nutritional status of the people of Uganda through coordinated, multi-sectoral interventions that focus on food security, improved nutrition and increased incomes.

The National Agriculture Policy

Food and nutrition security are emphasized in the National Agriculture Policy,[9] whose strategic policy actions are:

i. Promoting agricultural enterprises that enable households to earn daily, periodic and long-term incomes to support food purchases

ii. Promoting and facilitating the construction of appropriate agro-processing and storage infrastructure at appropriate levels to improve post-harvest management, add value and enhance marketing

[9] Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). 2013. *National Agriculture Policy*. Kampala: MAAIF.

iii. Developing and improving food handling, marketing and distribution systems, and linkages to domestic, regional and international markets

iv. Supporting the establishment of a national strategic food reserve system

v. Supporting the development of a well-coordinated system for collecting, collating and disseminating information on agricultural production, food and nutrition security across households, communities and agricultural zones

vi. Encouraging and supporting local governments to enact and enforce bylaws and ordinances that promote household food security through appropriate food production and storage practices;

vii. Promoting the production of nutritious foods, including indigenous foods, to meet household needs and for sale

viii. Promoting the consumption of diverse nutritious foods, including indigenous foods, at the household and community levels

ix. Promoting appropriate technologies and practices to minimize post-harvest losses along the entire commodity value chain

The Agriculture Sector Development Strategy and Investment Plan (DSIP) 2010/11–2015/16 and the Agriculture Sector Strategic Plan (ASSP) 2015/16–2019/20

The agriculture sector's DSIP 2010/11–2015/16 was developed partly in response to the CAADP. It reflects Uganda's commitment to the principle of agriculture-led growth as a main strategy for economic growth. The DSIP has two development objectives, both of which encourage efforts that can lead to improved nutrition: (i) increasing rural incomes and livelihoods; and (ii) improving household food and nutrition security. The DSIP has been replaced by the ASSP (2015/16 – 2020). In line with the National Agricultural Policy of 2013, The ASSP likewise emphasizes nutrition as a cross-cutting issue in the design of agriculture investments.

The UNAP, 2011–2016

In 2011, Uganda adopted the UNAP, with the goal of improving the nutritional status of all Ugandans, especially women of reproductive age, infants and young children. The UNAP specifically calls for integrating nutrition in agriculture development programs. Most of the activities to integrate nutrition into agriculture under this plan are outlined under objective 2, 'enhancing consumption of diverse diets'.

Vision 2040

The Ugandan National Planning Authority's Vision 2040 recognizes the need to promote good health and nutrition, especially for young children and women of reproductive age. It projects that promoting good health and nutrition for those two groups can reduce the number of maternal and child deaths by over 6,000 and 16,000 per year, respectively, as well as increase national economic productivity, both physical and intellectual, by an estimated UGX 130 billion per year.

National Development Plan (NDPII), 2015/16-2019/20

The NDP II (2015/16-2019/20) was designed to propel Uganda toward middle-income status by 2020, in line with the aspirations of Uganda's Vision 2040. The NDP II recognizes that nutrition is particularly important during early childhood, given its effect on individual health, cognitive development and economic outcomes into adulthood. The NDP II calls for more efforts by concerned sectors to reduce the prevalence of malnutrition in Uganda.

The NDP II echoes the second Sustainable Development Goal, with its emphasis on maintaining the momentum in reducing the prevalence of malnutrition. Nutrition was identified as a key cross-cutting issue that will be mainstreamed in government programs and projects, along with gender, HIV/AIDS, the environment, climate change, human rights, social protection and child welfare.

1.4.3 Nutrition situation in Uganda

In spite of the existence of global, regional and national frameworks, policies and strategies, as well as efforts over the years to increase

food production and improve household incomes, the nutrition situation has not improved much. From 1998 to 2006, the prevalence of stunting decreased from 45% to 38%, but remained way above the 11% target projected by the Millennium Development Goals[10]. Data from the 2011 Uganda Demographic and Health Survey[11] indicate that 33% of children under 5 years of age are chronically malnourished (stunted, or low height-for-age), 5% are acutely malnourished (wasted, or low weight-for-height), and 14% are underweight (or low weight-for-age). The prevalence of stunting is highest in Karamoja Region (45%) and lowest in Kampala (13.7%), as shown in Table 1. Forty-nine percent (49%) of children under 5 years of age, 31% of pregnant women, and 22% of non-pregnant women suffer from anaemia. Women in Karamoja (43.3%), West Nile (32.3%), and Central 2 (29.9%) regions have the highest prevalence of anaemia (Table 1).

[10] World Bank. 2011. *Nutrition at a Glance.* Nutrition at a Glance: Uganda. Washington, DC: World Bank.
[11] Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. *Uganda Demographic and Health Survey 2011*.Kampala: UBOS and Calverton, MD: ICF International Inc.

Table 1: Prevalence of stunting and anaemia in Uganda by region

	Stunting in children under 5 years of age (%)	Anaemia in children under 5 years of age (%)	Anaemia in women of reproductive age (15-49 years) (%)
Uganda (national average)	33	50	49
Kampala	14	40	19.6
Eastern	25	58	32.9
North	25	34	13.1
Central 1	33	57	23.5
East Central	34	68	28.8
Central 2	36	56	33.6
West Nile	38	64	32.3
South West	42	25	11.4
Western	44	40	18.8
Karamoja	45	70	43.5

Malnutrition is the underlying cause of as many as 45% of childhood deaths[12] in Uganda. Malnourished children who survive into adulthood are relatively weaker and their contribution to total productivity is impaired (total losses in productivity for 2009 are estimated at approximately UGX 1.2 trillion-equivalent to 3.91% of Uganda's GDP[13]). Reduced productivity in manual activities represents 29% of the total loss.

[12] World Bank: Nutrition at a Glance
[12]Uganda Bureau of Statistics and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011.Kampala, Uganda.
[12]World Food Program, 2012.Cost of Hunger in Uganda Summary Report.
[12]ibid.[12]World Food Program, 2012.Cost of Hunger in Uganda Summary Report.
[13]ibid.

CHAPTER TWO

2.0 AGRICULTURE ZONING STRATEGY IN UGANDA AND THE ENTERPRISE MIX APPROACH

2.1 Agro-Ecological Zones

An agro-ecological zone is a broad area in which ecological conditions, farming systems and other practices are fairly homogeneous. In such a zone, similar crops can be grown and similar livestock reared. The agro-ecological zones in Uganda include the following:

- North-Eastern Drylands
- North-Eastern Savannah Grasslands
- North-Western Savannah Grasslands
- Para Savannahs
- Pastoral Rangelands
- Highland Ranges
- Kioga Plains
- South-Western Farmlands
- Western Savannah Grasslands
- Lake Victoria Crescent

2.2 Agriculture Zoning Strategy

The MAAIF has been pursuing an agriculture zoning strategy for some time. It is one of the strategies developed and pursued according to agricultural production zones through a commodity-based approach[14], in which commodities that are best suited for each zone receive public sector support for the purposes of food security and

[14] Ministry of Agriculture, Animal Industry and Fisheries, 2013. *National Agriculture Policy*. Kampala: MAAIF

commercialization within the context of enterprise mixes. According to enterprise mix thinking, the Government of Uganda seeks to promote combinations of agricultural enterprises that enable households to earn daily, periodic and long-term incomes.

Efforts are also being made to support value chain development for strategic commodities in different zones in order to develop viable agro-industrial centres. These efforts are informed by the need to show immediate impact. As such, the MAAIF has decided to support the development of specific value chains, in addition to maintaining general support for agriculture. Accordingly, ten commodities were selected for support during the period 2010/2011–2015/2016: traditional export crops (coffee, tea); cereals (maize); fish; legumes (beans); tubers (cassava); livestock (dairy and beef cattle and poultry) and bananas.

2.3 Selected Enterprises in Agro-Ecological Zones

As part of the process to link the zoning strategy with the President's 'Prosperity for All' message[15], the President's Office organized zonal poverty alleviation and enterprise selection conferences in 2012, in which political and technical leaders from each region's districts selected agricultural enterprises based on the following agreed criteria:

- Agricultural suitability given soil types, temperature, humidity, and rainfall patterns
- Land availability, including size and tenure arrangements
- Farmer knowledge and skills
- Infrastructure to support production, processing, and marketing
- Availability of input suppliers and service providers

[15] 'Prosperity for all' is a vision-based conceptual and mobilization/messaging strategy focused on raising household incomes through varied approaches, such viewing food security as a basis for growth, organized marketing and microfinance.

- Availability of appropriate technology and advice
- Potential for agro-processing and other forms of value addition
- Potential market opportunities at the local, national, and international (export) levels
- Profitability potential
- Public/private sector partnership opportunities

The process resulted in prioritized production of food and cash crops and livestock in 18 administrative zones (Tables 2–10). These administrative zones do not necessarily coincide with the geographic areas covered by the agro-ecological zones. The report of the conferences presents a thorough analysis of 46 agricultural enterprise combinations in 18 administrative zones that households can undertake to maximize their net income. These enterprises include all ten of the strategic commodities the MAAIF has prioritized to promote specialization and value addition. Tables 2–10 indicate the selected enterprise combinations in the various administrative zones.

Table 2: Most Profitable Enterprise Combinations in Acholi and Lango

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
ACHOLI	Agago	6.5	Citrus, upland rice
	Amuru	29.3	Rice, citrus, pigs, fish farming
	Gulu	10.0	Banana, citrus, rice, dairy
	Kitgum	10.0	Citrus, pigs, apiculture, groundnut, cassava, vegetables & legumes (intercrop), goats, dairy
	Lamwo	8.5	Citrus, cassava, dairy, poultry, banana
	Pader	5.0	Pigs, dairy, local poultry, citrus, banana, cassava, local goats, apiculture, fish farming
	Nwoya	5.0	Citrus, rice, local poultry, banana
LANGO	Amolatar	7.0	Fish farming, goats, dairy, sheep, poultry, rice, groundnut, sesame, soya, maize
	Apac	10.0	Sunflower, cassava, local poultry, dairy, fish farming
	Dokolo	4.0	Sunflower, cassava, local poultry, dairy, apiculture, pigs, maize
	Kole	4.5	Poultry, apiculture, dairy, pigs, cassava, citrus
	Lira	5.0	Poultry layers, pigs, citrus, pineapple, rice
	Oyam	9.0	Pineapple, rice, onions, local poultry, apiculture, cassava

Table 3: Most Profitable Enterprise Combinations in Madi and West-Nile

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
MADI	Adjumani	12.5	Rice, pigs, poultry, pineapple, banana
	Moyo	3.0	Vegetable and fruit, apiculture, pigs, poultry, cassava, maize
WEST NILE	Arua	3.5	Cassava, peas, dairy, maize, apiculture, fruit
	Koboko	5.0	Pineapple, dairy, poultry, maize
	Maracha	2.5	Poultry, apiculture, fruit, beans, cassava, groundnut
	Nebbi	3.0	Mango, orange, poultry, cassava, apiculture, dairy, goats
	Yumbe	4.0	Cassava, apiculture, fruit, goats, poultry
	Zombo	3.0	Coffee, dairy, cassava, beans

Table 4: Most Profitable Enterprise Combinations in Mengo

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
MENGO	Buikwe	2.5	Banana, poultry, tomato
	Butambala	1.3	Banana, ginger, poultry
	Buvuma	3.1	Rice, banana, dairy
	Gomba	2.5	Coffee, banana, dairy, mango
	Kalangala	5.0	Palm oil, fish farming, poultry
	Kayunga	2.0	Banana, pineapple, dairy
	Luwero	4.0	Coffee, banana, pineapple, dairy
	Mukono	3.0	Banana, coffee, poultry, vegetable
	Mpigi	2.0	Coffee, banana, poultry
	Nakaseke	2.7	Coffee, banana, poultry, pigs
	Nakasongola	3.0	Poultry, mango, maize
	Wakiso	2.0	Banana, maize, fruit, vegetable

Table 5: Most Profitable Enterprise Combinations in Ankole and Kigezi

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
ANKOLE	Sheema	2.0	Coffee, banana, poultry
	Rubirizi	1.7	Poultry, banana
	Buhweju	8.3	Tea, coffee, banana, pigs
	Ibanda	3.7	Poultry layers, apiculture, horticulture, coffee, cassava, sweet potato
	Isingiro	2.5	Coffee, banana
	Bushenyi	1.3	Dairy, pigs, poultry, vegetables, apiculture, banana, sweet potato
	Mbarara	2.5	Coffee, banana, pigs, fruits
	Mitooma	3.2	Coffee, banana, pigs, poultry layers, dairy
	Kiruhura	18.9	Banana, coffee, fruits, apiculture, pigs
	Ntungamo	2.5	Banana, coffee, pineapple, passion fruit, apiculture
KIGEZI	Kabale	1.0	Apples, mushrooms, poultry
	Kanungu	2.6	Irish potato, coffee, rice, banana
	Kisoro	2.0	Apple, Irish potato, dairy, tea
	Rukungiri	2.2	Banana, coffee, pigs, poultry

Table 6: Most Profitable Enterprise Combinations in Toro and Bunyoro

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
TORO	Bundibugyo	3.2	Coffee, banana, dairy
	Kabarole	1.5	Banana, poultry, pigs
	Kamwenge	5.0	Maize, poultry, coffee
	Kasese (mountains)	2.0	Coffee, banana, pigs, fish farming
	Kasese (lowlands)	2.0	Maize, mango, poultry
	Kasese (pasture)	2.0	Dairy, poultry, maize
	Kyegegwa	5.0	Pineapple, banana, pigs, mango
	Kyenjojo	2.0	Coffee, pineapple, Irish potato, poultry
	Ntoroko (cropland)	3.0	Coffee, poultry, cassava,
	Ntoroko (pasture)	NA	Dairy, poultry, cassava
BUNYORO	Hoima	7.5	Pigs, poultry, maize, pineapple
	Bullisa	2.0	Cassava, fish farming, pigs, poultry
	Kiryandongo	3.0	Banana, dairy, pineapple, poultry
	Masindi	8.1	Mango, green pepper, banana, cassava, pine woodlot
	Kibaale	4.3	Coffee, dairy, apiculture, cassava

Table 7: Most Profitable Enterprise Combinations in Teso and Karamoja

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
TESO	Amuria	5.0	Citrus, pigs, apiculture
	Bukedea	7.1	Citrus, apiculture, poultry
	Kaberamaido	10.0	Citrus, apiculture, dairy, groundnut, cassava, pigs
	Katakwi	2.5	Coffee, banana, pigs, fruit
	Kumi	3.0	Citrus, poultry, apiculture, vegetable
	Ngora	2.0	Citrus, pigs, apiculture, poultry, fish farming
	Serere	3.0	Citrus, dairy, poultry
	Soroti	3.0	Citrus, poultry, apiculture
KARAMOJA	Abim	20.0	Cassava, beans, poultry, goats, pigs
	Amudat	8.0	Camel, maize, beans, apiculture
	Kaabong	10.0	Cattle, sorghum, bulrush
	Kotido	8.5	Groundnut, apiculture, orange, sesame
	Moroto	3.5	Goats, cattle, sorghum, apiculture
	Nakapiripirit	10.0	Sorghum, maize, beans, sesame, green grams, cattle
	Napak	5.0	Sorghum, cattle, pigs, apiculture

Table 8: Most Profitable Enterprise Combinations in Busoga and Bukedi

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
BUSOGA	Bugiri	3.8	Coffee, dairy, orange, tomato, watermelon, banana, poultry, fish farming
	Buyende	5.0	Maize, watermelon, dairy, apiculture, citrus
	Iganga	2.7	Cattle, banana, poultry, fish farming
	Jinja	1.0	Fish farming, tomato, banana, pineapple, apiculture
	Kaliro	4.0	Citrus, pineapple, apiculture, pigs
	Kamuli	3.0	Cassava, maize, sweet potato, beans, poultry, fish farming
	Luuka	2.5	Poultry layers, pineapple, banana
	Mayuge	2.0	Poultry layers, fish farming, groundnut
	Namayingo	3.8	Pineapple, beans, maize, poultry layers, fish farming
	Namutumba	3.0	Fish farming, poultry, rice
BUKEDI	Tororo	2.5	Local poultry, rice, mango
	Pallisa	2.5	Orange, apiculture, dairy, cassava
	Kibuku	2.0	Mango, orange, pigs
	Busia	2.0	Poultry, fish farming, pineapple, maize, dairy
	Butaleja	2.0	Tomato, cabbage, poultry layers, fish farming, rice, citrus, mango
	Budaka	3.8	Poultry layers, mango, orange, tomato

Table 9: Most Profitable Enterprise Combinations in Mubende and Masaka

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
MUBENDE	Kiboga (cropland)	3.0	Coffee, banana, dairy, poultry layers
	Kiboga (pasture)	50.0	Dairy, mango, pineapple,
	Kyankwanzi (cropland)	3.0	Pineapple, dairy, banana
	Mityana	3.0	Dairy, cattle, apiculture, fish farming
	Mubende	6.1	Poultry, banana, coffee
MASAKA	Sembabule	15.0	Goats, coffee, banana, dairy
	Rakai	2.5	Coffee, banana, poultry
	Masaka	2.5	Poultry, coffee, pigs, apiculture, banana, fish farming
	Kalungu	4.0	Fish farming, coffee, banana, poultry
	Lwengo	2.5	Coffee, banana, pigs
	Bukomasimbi	2.5	Coffee, poultry, tomato
	Lyantonde	2.5	Banana, watermelon, poultry

Table 10: Most Profitable Enterprise Combinations in Sebei and Bugisu

Zone	District	Average Land Holding (Acres)	Most Profitable Enterprises
BUGISU	Bududa	1.2	Coffee, banana, dairy
	Bulambuli	1.0	Coffee, bogoya, garlic, dairy, fish farming
	Manafwa	2.3	Banana, poultry, beans
	Mbale	1.5	Coffee, banana, poultry, pigs, fish farming
	Sironko	1.0	Coffee, banana, dairy, poultry, beans
SEBEI	Bukwo	3.0	Maize, beans, wheat, coffee, banana, dairy, poultry, fruit, apiculture, goats, sheep, apple, watermelon, sunflower
	Kapchorwa	1.5	Coffee, banana, dairy
	Kween	2.5	Cattle, poultry, pigs, coffee, banana

A critical look at the criteria used to select the regional enterprises reveals that nutrition was not one of the selection criteria. Therefore, while the enterprises are commercially important, they may or may not be nutrition sensitive. In addition, while income growth (including off-farm jobs) can be an important factor to improve household food security and nutrition, it may not necessarily result in improved nutrition. This has been demonstrated in the case of South Western Uganda, which has high stunting rates—42% compared to the national average of 34%[16]—despite impressive agricultural production. Since agriculture is the main livelihood for over 80% of the rural population,

[16] Uganda Integrated Food Security Phase Classification (IPC) Technical Working Group. 2014. *Report on the Integrated Food Security Phase Classification Analysis for Uganda.* Rome: Uganda IPC Technical Working Group.

who are most affected by undernutrition[17], the need to use a nutrition-sensitive agriculture approach to improve the welfare of rural households cannot be over emphasized. While zonal-based enterprise selection is important to the extent that it prioritizes income and profitability, there is a need to empower extension workers and their agents to also consider nutrition when guiding the selection process.

[17] Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. *Uganda Demographic and Health Survey 2011*.Kampala: UBOS and Calverton, MD: ICF International Inc.

CHAPTER THREE

3.0 CRITERIA FOR INTEGRATING NUTRITION INTO AGRICULTURAL ENTERPRISE MIXES

3.1 Overview

This section provides general principles for ensuring the selection of appropriate nutrition-sensitive agriculture enterprises, as well as strategies to be considered in the integration of nutrition into day-to-day agricultural extension service delivery. There are four key principles that should be considered to ensure the integration of nutrition into agriculture enterprise mix design. While gender is a principle in its own right, highlighting some of the significant gender issues that may affect other principles is useful, given the important role that gender plays in agricultural production and the management of proceeds therefrom. The four principles are:

- Regular incomes flows
- Production of nutrient-rich foods
- Protection of the environment and ensuring household resilience
- Gender and family care

It is important that the enterprise selection process be linked to and preceded by community mobilization and capacity building at all levels to ensure that the consequences of food insecurity and malnutrition are fully appreciated. Farming households should understand that some of the causes of food insecurity and malnutrition are within their means to address, while others are the responsibility of local governments and development agencies. Farmers should understand that the consequences of food insecurity and malnutrition are grave and that mitigation measures are required, including at the enterprise selection stage. Agriculture extension workers need to work closely with community development workers, volunteers and other

stakeholders to ensure that the opportunity to engage in community mobilization and capacity building is not missed.

3.2 Regular Incomes Flows

The overall objective of the 2013 National Agriculture Policy is to achieve food and nutrition security and improve household incomes through coordinated interventions that focus on enhancing sustainable agricultural productivity and value addition, providing employment opportunities, and promoting domestic and international trade.

The explicit focus of the policy on increasing household incomes and trade suggests that income growth is already an implied core responsibility of all extension agents in enterprise promotion. Thus, as we integrate nutrition sensitivity into enterprise mix design, income gains should remain a prominent issue.

Impoverished households face difficult decisions on how to allocate their spending, and evidence shows that the poor purchase and consume greater amounts of cheap, energy dense foods that are filling, but have lower nutritional quality, as compared to higher income households[18]. In addition, in agricultural systems, high levels of income may have relatively little impact on nutrition if income flows are not well planned throughout the year. Research has shown that regular income flows (e.g., weekly or monthly) lead to improved household welfare, including better nutrition outcomes, especially when controlled by women.[19] Therefore, it is important to promote livestock and crop enterprises that favour women, which will ensure that they control the income. However, regardless of who controls the income, it is always important to ensure that it is invested in household

[18] Food Research and Action Center. 2016. 'Fighting Hunger and Obesity'. Available at: http://frac.org/initiatives/hunger-and-obesity.
[19] Kikafunda JK; Agaba, E; and Bambona, A. 2014. 'Malnutrition amidst Plenty: An Assessment of Factors Responsible for Persistent High Levels of Childhood Stunting in Food Secure Western Uganda'. *African Journal of Food, Agriculture, Nutrition and Development*. 14:5. Pp. 9288-9313.

nutrition needs, which implies the need for concerted efforts to increase awareness on gender issues in the management of production and attendant proceeds. Actions to facilitate the generation of regular income for households during enterprise design may include promotion of the following:

3.2.1 Livestock Production

One advantage for households with dairy cows is that milk is available throughout the year for household consumption. In addition, milk sales can provide a continuous source of income. It is estimated that about 70% of milk in Uganda is sold commercially, compared to about 30% consumed on the farm[20]. About 90% of raw milk sales occur though informal channels in local markets and little of this milk is processed, although a small and growing cottage industry of household processors is producing yoghurt, cheese and other products. A small number of commercial processors produce pasteurized milk, Ultra High Temperature milk, cheeses, milk powder, yoghurt, etc.

Cross-bred cows can be managed under zero-grazing for small landholdings, and with relatively reduced animal healthcare input costs. However, exotic pure- or cross-bred cows require a relatively large investment as well as proper animal husbandry practices, access to veterinary and other extension services, and feed. Resource-poor farmers may not be able to afford exotic breeds of cattle and thus, may need to select other affordable livestock, such as poultry, rabbits, goats and/or pigs.

[20] Choudhary, Vikas; Engelen, Anton Van; Sebadduka, Sam; Valdivia, Pablo. 2011. *Uganda dairy supply chain risk assessment*. Washington DC: World Bank.

Fish, poultry, rabbits, pigs and goats have higher feed conversion rates, shorter production cycles, and are easy to rear and sell than cattle[21]. In traditional settings, cultural norms constrain women from making decisions, especially on big assets such as cows. However, it is easy for women to own and control small livestock because of their limited monetary value[22], which enables them to make decisions regarding the sale or slaughter of these small animals. In addition, poultry can provide a continuous supply of eggs for consumption and sale, thus ensuring an almost daily income flow as well as a supply of high quality protein to households. In the case of scavenging poultry, low labour input requirements may facilitate the provision of care for these animals by women and children, who are commonly in charge of small livestock. Poultry also produces manure for use as fertilizer.

3.2.2 Crop Enterprises with Regular Cash Flows

Most crop enterprises are seasonal. Very few allow regular income flows, unless their planting is staggered and/or households have access to irrigation technologies for off-season production. A few examples of crop enterprises with regular income flows include banana production, mushroom growing, and irrigated vegetable production. Alternatively, a mix of livestock and crops enterprises often brings more income than one or the other alone, because there are close links between crop and livestock production that provide flexibility in matters such as choice of ploughing and manure application times[23], as well as crop residues for animal feed.

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[21] Most exotic breeds of livestock are reared in commercial integrated systems. The most significant risk is disease, particularly New Castle disease in poultry, which requires that smallholders have access to veterinary services and/or medicines, or they risk losing most or all of their flock.

[22] Njuki, Jeminah and Sanginga, Pascal. 2014. *Gender and Livestock: Key Issues, Challenges and Opportunities.* Brief. Nairobi: International Livestock Research Institute.

[23] International Fund for Agricultural Development (IFAD), *Rural Poverty Report 2001: The Challenge of Ending Rural Poverty*. Oxford: Oxford University Press.

3.2.3 Promotion of Access to Off-Farm Income: The Role of Food Processing and Preservation

The promotion of off-farm income-generating activities is another way to promote regular income flows for farming households, as insurance against food price hikes, hiccups in weather patterns and poor yields, all of which can lead to food and nutrition insecurity. Food processing, especially if rurally based, is very important for ensuring off-farm income.

While crop enterprises are seasonal, food processing and preservation can allow almost continuous marketing of products, provide associated income flows throughout the year, and increase total household earnings. Other interventions in the community that allow for regular, off-farm income also have potential positive food security effects. These include training farmers in skills such as carpentry and bricklaying, among others. In communities where agriculture is a dominant activity, these skills can be useful in servicing the agriculture system; for instance, to repair agriculture machinery and equipment, or build water harvesting infrastructure.

Household- or cottage-level food processing increases participation in the food value chain and can have a mobilizing and empowering effect on the community. Farmers' groups, for example, can be organized to process and market products such as fruit juices, jam, dried fruit chips, and vegetable and animal products. These practices also help to ensure that processed foods meet standards for commercial sale, in the event that the cottage-level industries continue to grow.

Extension workers need to train and sensitize farmers and cottage-level food processors about good manufacturing practices and good hygiene practices during processing. Promoting food quality and safety along the agriculture value is essential for:

- Maintaining the wholesomeness of food products, both physically and nutritionally

- Eliminating spoilage by micro-organisms and prolonging the shelf life of the food products
- Eliminating pathogenic micro-organisms such as salmonella, *E.coli*, and aflatoxin-producing mould, which would otherwise contaminate food products

KEY MESSAGES FOR EXTENSION WORKERS

- Ensure enterprise mix design allows for regular income flows (at least weekly or monthly) to the household.
- Focus on animal and crop enterprise mixes because they can help ensure regular income, provision of a more nutrient-dense diet, and manure for crop production.
- Promote household-level food processing, especially for women groups, to improve stable access to nutritious food products and regular income flows for farm households.

3.3 Production of Nutrient-Rich Foods

Objective 1 of the National Agriculture Policy, 2013 mandates that the Ministry ensure household and national food and nutrition security for all Ugandans, to be partly achieved through:

- Promoting the production of nutritious foods, including indigenous foods, to meet household needs and for sale
- Promoting consumption of diversified nutritious foods, including indigenous foods, at the household and community levels

Therefore, extension workers and their agents should promote a balanced approach, including the production of highly profitable traditional and non-traditional cash crops, diversified household production, and consumption of highly nutritious foods. Promoting

the production of nutrient-rich foods will facilitate changes in household nutrition through consumption of a more diversified diet and improved quality of available food. Extension workers and their agents can promote a balanced approach to cash crops for income generation, diversified household production, and consumption of nutritious foods. This approach intervenes at various points along the commodity production to consumption value chain. Such interventions may include the promotion of:

- Women-managed home and/or community gardens with commonly consumed vegetables and fruits that fit with local agro-climatic conditions. Such activities empower women and provide the potential for sales of surplus production.
- Bio-fortified food production (e.g., iron-rich beans, high-protein maize, orange-fleshed sweet potatoes)
- Women-owned small animal production, such as poultry, rabbits, fish, pigs and goats, to provide animal-sourced food and/or for income generation.
- Large animal livestock production, especially zero-grazing for dairy cattle, where appropriate.
- The addition of major micronutrients such as iron and vitamin A, and the utilization of techniques that minimize nutrient losses during food processing and preservation.
- Safe food-handling practices throughout the entire food value chain, including during production, post-harvest handling and food preparation. These can include actions such as improving post-harvest handling and storage to reduce the incidence of aflatoxins in groundnuts and maize, and engaging in integrated pest management to reduce pesticide costs and the potential for excess residues.

In the long term, a subject matter specialist in food and nutrition security at the district level can play a key role in building the capacities of actors along the agriculture value chain in aspects of food and nutrition security.

KEY MESSAGE FOR EXTENSION WORKERS

Consider a mixture of inexpensive livestock that can provide regular animal food products/by-products and nutrient-rich crop varieties, including bio-fortified and indigenous crop varieties, in the design of enterprise mixes as a pathway to better household nutrition.

3.4 Protection of the Environment and Ensuring Household Resilience

Climate change is already affecting food security in Uganda through reduced production of major food crops as a result of increased occurrences of droughts, floods and soil erosion through landslides (NEMA, 2008). Prolonged dry spells and high temperatures reduce productivity, particularly for rain-fed production, and can lead to new crop pests and animal diseases. Floods pose immediate danger to people, livelihoods and property and can cause widespread crop damage. These and other shocks can affect nutritional outcomes by directly affecting household food security. Households with limited savings and other assets are especially vulnerable to external shocks, such as climate change and fluctuations in crop prices, as well as internal shocks, such as a death in the family, prolonged sickness, or loss of remittance support. For the poorest households, even small shocks can push them over the edge, requiring them to sell productive assets, forego health care, or reduce food consumption. This vulnerability underscores the lack of resilience among this sub-population, in particular. Incorporating efforts to improve resilience

into extension activities will enhance smallholder capacity to deal with sudden changes in the agricultural environment on which they depend.

Men and women use natural resources in different ways and employ different allocation and conservation measures[24]. Understanding the different roles and responsibilities of men and women in environmental management is critical to understanding how these will affect productivity, sustainability, and inevitably, food security and nutrition. However, it should be appreciated that women are the ones mostly involved in subsistence farming activities, where they inevitably interact with the environment, which they depend on. Therefore, extension workers need to understand gender-specific knowledge and practices in environmental management.

Some of the required actions are only possible at the (national) policy level, while others can be undertaken at the extension (community) level.

3.4.1 Actions at the Policy Level

Examples of actions that are largely beyond the control of extension workers but are important to promote resilience include the following:

- Improving climate-resilient agricultural practices, technologies and infrastructure by testing and promoting varieties that are heat and drought tolerant, including indigenous varieties with high nutritional values.
- Increasing the availability and efficient use of water for smallholder agricultural production by providing bulk-harvested water for animals and irrigation and promoting water conservation practices.

[24] World Bank, Integrating gender into development projects: Gender and natural resource management (http://info.worldbank.org/etools/docs/library

- Increasing capacity to manage short- and long-term climate risks and reduce losses from weather-related disasters by providing communities with access to weather and climate information.
- Establishing a food security and nutrition information system for timely tracking of vulnerability and follow-up actions to counteract potentially negative nutrition and food security outcomes.
- Strengthening national agricultural market information systems to ensure correct and timely tracking of product prices and demand.
- Developing markets for domestic, regional, and if possible, international enterprises. While overseas markets provide opportunities for larger sales volumes, it can be very risky for small-scale farmers to engage in these markets because of the potential for price volatility. Enterprises with both domestic and export markets allow farmers to have a domestic fall-back position in case of export price volatility.
- Designing innovative enterprise mixes with inbuilt resilience to unfavourable natural and market shocks. Such mixes require the inclusion of perennial crops and animal enterprises in enterprise design. Weather vagaries such as drought have significantly less impact on farm households with highly established perennial crops, such as fruit, coffee, cocoa and tea, as opposed to those that only grow annual crops, such as beans, maize and vegetables. Inclusion of irrigation technologies further improves adaptation strategies/resilience capacity in the cropping portion of enterprise mix designs. Also, large animal enterprises can be more adaptable to prolonged drought and changes in weather patterns, as compared to crop enterprises. Animals can also serve as insurance against market risks. In the absence of significant shocks (e.g., disease outbreaks, severe prolonged drought), the prices of animal-based products are relatively more stable than crop prices over time.
- Developing farmer-friendly agriculture insurance and credit facilities.

3.4.2 Actions at the Extension (Community) Level

Regardless of whether or not higher-level initiatives are taken, extension agents at the sub-national level can be instrumental in reducing vulnerability to natural and market risks. Climate variability can threaten the main source of income, and possibly food, for households, and many may lack the resources to counter the impact. By increasing and promoting income and asset diversification among smallholder farmers, extension agents can assist households to diversify their income streams, reducing their vulnerability to external shocks and enhancing their food security.

Farmers' exposure to risk and uncertainty is often aggravated by a lack of information about weather, input choices, farm management practices, and market prices. The absence of such information can have an adverse impact on crop production and income. In many circumstances, smallholders rely upon traditional knowledge and agricultural practices to cope with shocks and stresses. However, climate change and other variations contribute to the erosion of this coping capacity, leaving smallholders more vulnerable to changes in the climatic or economic environment.

Extension agents can improve farmers' adaptive capacity by helping them to adopt strategies for adapting to change and uncertainty. Examples of support that extension agents can provide include the following:

- Assisting farming households to identify and address gender-related environmental management issues to positively influence food production.
- Assisting households to enhance their capacity to adopt alternative inputs, practices, and water management systems through awareness creation on climate change and resilience practices at the household level.
- Facilitating the establishment of community-based early warning systems.

- Improving household access to gender-sensitive information on climate-smart agriculture and promoting information and knowledge sharing in the community through public meetings and/or farmer field schools.
- Promoting sustainable and climate-smart soil and water management techniques.
- Promoting nutrient-rich crop and livestock enterprises that are drought and/or disease tolerant.
- Promoting crop enterprises that can benefit from water harvesting.
- Promoting livestock enterprises that minimize the risk of zoonotic diseases.
- Facilitating the design of smallholder farmers' area-specific enterprise mixes that diversify income and household food supply and reduce environmental and market risk. Ideally, these designs should include nutrient-rich perennial crops and nutrition-enhancing animals (e.g., dairy cattle, goats, poultry, fish, rabbits).

KEY MESSAGE FOR EXTENSION WORKERS

Promote enterprise mixes and practices that can withstand the vagaries of nature and protect against unfavourable market changes, as well as benefit from low-cost local risk mitigation innovations or solutions.

3.5 Gender and Family Care Considerations

3.5.1 Why Use a Gender Lens in Food and Nutrition Programs

There is a difference between gender and sex. Sex describes the biological and physiological differences between men and women, while gender refers to 'social attributes and opportunities associated with being male or female and the relationships between women and men and girls and boys as well as relations between women and those between men'[25]. These attributes, opportunities and relationships are socially constructed and learned through socialization. Although these may vary from society to society and change over time, they have an impact on agricultural production and nutrition.

Social and cultural attitudes and perceptions influence how women and men perceive themselves and their roles in society, which consequently influences agriculture and nutrition outcomes. Examples of the ways in which gender expectations and roles affect agricultural processes include the following:

- Women are often responsible for productive and reproductive work, but they do not participate in most agricultural projects due to their limited power to influence decisions at various levels.
- Few women own or control land. Rather, they access it through their husbands or male relatives and thus, must utilize it according to specific instructions, which may not necessarily guarantee food security or adequate nutrition. For example, few women determine which enterprises will be undertaken on the land. Even when they do have a say in this determination, they usually are only permitted to decide on food crop enterprises, while men decide on cash crop enterprises. Food crop enterprises are typically restricted to small plots, leaving the bigger plots for cash

[25] UN Entity for Gender Equality and Empowerment of Women. 2016. "Concepts and Definitions." Available at: http://www.UN.Org/womenwatch/osagi/concepts and definitions.

crops. In addition, men are in charge of marketing most of the produce.

- Some interventions aimed at increasing household food availability and/or income can end up having a reduced impact on nutrition if the activities are so time-consuming that they interfere with caregivers' ability to adequately care for children.

3.5.2 How Can Extension Agents Create Awareness on Gender and Family Care Issues?

- Men and women should both be encouraged to participate in all agricultural extension activities.
- Men and women should both participate in all agriculture technology transfer activities.
- Communities should be encouraged to select enterprises that address both women's and men's needs, thereby limiting conflict.
- Women should be encouraged to take leadership roles and be part of decision-making processes at the village level and beyond. Likewise, men should be encouraged to support women in leadership roles to create a favourable enabling environment for them to exercise their potential. This will position women to articulate issues that promote food security and nutrition.
- Women should be encouraged to form or join savings and credit associations, as this will improve their access to affordable credit and enable them to invest in enterprises that promote nutrition.
- Men and women should be engaged in discussions of their respective roles in the household division of labour. These discussions should address the proportion of time that men and women in the household spend on land preparation, planting, weeding, fertilizing, and harvesting, food preparation (including fetching water), child care, and other responsibilities.
- Communities should be sensitized to the importance of labour-saving technologies that allow women to manage competing priorities, such as child care, meal preparation, animal care and gardening. Particularly important are those interventions that

allow them to prepare safe, nutritious baby foods. Technologies and actions that can save time and energy include:

- Farm technologies that reduce drudgery (household labour requirements), such as use of tractors, animal traction, and herbicides to minimize tillage.
- Labour or energy-saving technologies for food preparation, such low-technology water pumps, eco stoves, low-cost solar driers for fruits and vegetables, milling machines, graters, rainwater harvesting devices, and fuel-efficient stoves.
- Planting of wood lots and promotion of agro-forestry activities near homes, which can increase access to biomass energy, increase total farm incomes, reduce labour costs associated with scavenging for firewood, and increase the resilience and sustainability of the food production system.
- Enterprises that require relatively little labour and/or offer flexibility for child care should be selected, such as broiler chickens, which are less labour-intensive than traditional layers. In addition, some farming activities, such as household-level food processing and mushroom growing, can be carried out near home, thus making it relatively easy for women to care for their children.
- Links should be established with other stakeholders to promote community-based childcare centres within farming communities as part of overall agricultural development programs.

It is important to note that during community awareness-raising sessions on gender roles, agents should avoid encouraging household discussions that portray women as victims of unfair treatment. This can cause distrust among men and defeat the purpose of raising awareness on women's empowerment.

KEY MESSAGES

What can be done to improve gender relations to favour enterprise combinations that consider nutrition and family welfare? Agricultural extension workers should work closely with community development workers to:

- Promote intensive community mobilization around gender and other social and cultural issues that negatively affect nutrition security.
- Consider enterprises with suitable energy, time and labour-saving technologies to free women from some of their workload.

Glossary

Food security: Food security exists when all people, at all times have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and preferences for an active and healthy life. Food security comprises four (4) dimensions, namely:

- ***Food availability:*** Having enough volume of food from household production, at food markets, and through food assistance.
- ***Food access*****:** Having enough income and savings to buy the right volume of high-quality food for a nutritious diet. Important factors include who makes household spending decisions, food prices, and access to food markets.
- ***Food utilization:*** Depends on health status (i.e., how efficiently the body uses food to get energy and essential nutrients like vitamins and minerals from the diet); access to safe (potable) water and good sanitation; knowledge of safe food storage; household food processing; childcare practices; and ability to care for the sick.
- ***Food stability:*** Having both reliable food availability and consistent access to food over time.

Poverty in Uganda: The official poverty line is based on the cost of the basic food and non-food essentials from household budget surveys. The food poverty line represents the cost to the poorest 50% of the population of a food bundle that provides the necessary energy requirements for one person for a day (around 2,300 kilocalories). The non-food poverty line represents an allowance for basic non-food needs of the population whose total consumption is near the food poverty line. A household is defined as poor if total expenditures per capita (including purchases, in-kind and consumption from own production) fall below the poverty line[26] .

[26] Uganda Bureau of Statistics and World Food Programme. 2013. *Comprehensive Food Security and Vulnerability Analysis (CFSVA).* Rome: World Food Programme.

Nutrients: These are broadly classified into carbohydrates, proteins, fats, vitamins, minerals, dietary fibre, and water. Nutrients are required by the body to provide energy, build and repair tissue, maintain warmth, fight infections, and regulate body functions. While no single food contains all necessary nutrients, breast milk meets all the nutritional requirements for infants up to 6 months postpartum.

Nutrition: This includes the processes involved in the consumption and use of foods for the proper health of an individual. Nutrition is affected by the way food is harvested, stored, handled, prepared, consumed, and used by the body. The individual's health is an important contributor to nutritional status, as sickness affects the body's capacity to absorb nutrients. In general, good nutrition means consuming the right (diverse and balanced) mix of foods (i.e., eating the correct quantity of good quality foods that have been prepared properly, in a hygienic manner, and at the right time).

Dietary diversity: This is defined as the number and variety of individual food items or food groups consumed over a given period of time.

Enterprise mix: This refers to a set of on-farm businesses in which farmers engage. Given the resource endowment of farmers in a particular area, it should be feasible and profitable enough to provide for their livelihood needs.

Nutrition-sensitive programs: These are programs that address the underlying determinants of foetal and child nutrition, including most activities in agriculture, education, water and sanitation, income generation, social protection, and health.

Nutrition-specific programs: These are programs that address the immediate determinants of maternal and young child nutrition and development, such as immunizations, breastfeeding, and feeding and hygiene practices.

Malnutrition: This is a general term that includes many conditions, such as undernutrition (when the body receives less nutrients than required), overnutrition (excessive food intake and imbalance of nutrients, which can lead to obesity, gout, arthritis, high blood pressure, and diabetes) and micronutrient deficiency diseases. As noted above, the health of the individual and sanitary conditions can contribute to malnutrition, as it is a multifaceted problem.

Wasting: Characterized by thinness, wasting is an indicator of acute (short-term) malnutrition. Wasting is usually the result of recent food insecurity, infections or acute illnesses such as diarrhoea.

Stunting: Characterized by shortness, stunting is an indicator of chronic (long-term) malnutrition. It is often associated with poor physical and intellectual development during childhood, and it is one of the harmful effects of poverty.

Underweight: Underweight is an indicator of both acute and chronic malnutrition.

Biofortification: This is the process of breeding food crops that are rich in micronutrients, such as vitamin A, zinc, or iron. Examples of such crops include orange-fleshed sweet potatoes, iron beans and pearl millet, vitamin A maize and cassava, and zinc wheat and rice. Some crops are considered micronutrient-efficient varieties, meaning that they grow deeper roots in mineral-deficient soils and are better at tapping subsoil water and absorbing minerals.

Annex 1: Community Mobilization and Capacity Building for Nutrition

Community mobilization for nutrition aims to positively influence nutrition-related attitudes, beliefs, practices, and behaviours. It involves assisting farmers' groups and households to identify the causes and consequences of malnutrition, the benefits of addressing those causes, and appropriate actions that will lead to the desired change.

A likely underlying factor of persistent malnutrition is that most community residents lack a general understanding of nutrition. For example, many people do not understand the causes and consequences of insufficient attention to maternal, infant, and young child feeding and care practices, in particular during the first 1,000 days of life (from conception until the age of two). This 1,000-day period is critical because of the rapid physical and mental growth that occurs at this time. It is also the window of opportunity to prevent the permanent effects of malnutrition. Malnourished women give birth to low birth weight babies, transferring the economic disadvantages of malnutrition to the next generation. Malnourished children are more likely to suffer from stunted physical growth than healthy children, and they have an increased risk of mortality, illness and infections. Children who are chronically malnourished have poor physical and mental development, are prone to quit school, earn low incomes and have low productivity potential.

Given the relative lack of knowledge about food and nutrition, especially in the agriculture sector, capacity building at all levels (national, district and community) is essential to promote community mobilization. The aspects to be emphasized during capacity building include food and nutrition education, post-harvest handling and food storage, small-scale food processing at the household level, marketing

and market research for food products, family life education and women's empowerment.

FURTHER GUIDANCE

For further guidance, extension workers should make use of:

Community Mobilization on Food and Nutrition Security: A Guide for Community Mobilizers, 2015 (Ministry of Gender, Labour and Social Development)

Food and Nutrition Handbook for Extension Workers, 2015 (Ministry of Agriculture, Animal Industry and Fisheries)

Community and Household Mobilization–Focus Areas

Why Nutrition Matters	• The cost of child undernutrition is estimated at 1.8 trillion UGX • About 33% of Ugandan children under 5 years of age are stunted • 14% of children under 5 are underweight • 50% of children under 5 are anaemic, as are 24% of women of child-bearing age • Under-nutrition greatly contributes to poor pregnancy outcomes and mortality among mothers and children under 5 • Child undernutrition generates health costs equal to 11% of the country's total health budget • 54% of the working age population is stunted • Undernutrition contributes to more than 50% of mortality among children under 5 • Overnutrition and unsafe food consumption is becoming a problem in Uganda, contributing to the rising incidence of cancer, diabetes, cardiovascular diseases, and dental disease
Causes of Malnutrition	• Household food insecurity • Diets poor in quantity, nutrient density, variety, or consumption frequency • Poverty • Inadequate care for mothers and children • Limited understanding of differing nutritional requirements in the household (e.g., among children, pregnant women, the elderly), compounded by low levels of education • Unhygienic living conditions, such as poor water supply and sanitation • Disease • Incongruous traditional beliefs and practices • Inadequate health care services • Improper food preparation, such excess boiling, which reduces nutrient content • Improper food handling, such as inappropriate drying and storage practices and untimely harvesting
Improving Nutrition	• Increase production of a variety of nutrient-dense foods rich in micronutrients and protein, such as fruits, vegetables, animal-sourced foods, legumes and biofortified crops. • Promote community involvement in home gardens by supporting village nurseries. • Improve household food safety with good sanitation and food handling practices. • Understand the nutritional requirements of different family members and associated care and feeding practices. • Promote consumption of a healthy diet and locally-available, nutrient-dense foods. • Reduce post-harvest losses and introduce household-level processing to increase income and increase access to and consumption of diverse foods. • Reduce seasonal food insecurity by diversifying production throughout the year, improving storage and food processing and ensuring regular, adequate income flows.

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