

SUSTAINABLE DIETS FOR ALL

DISCUSSION
PAPER

Putting indigenous foods and food systems at the heart of sustainable food and nutrition security in Uganda



Hivos
people unlimited

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DEFINITION OF KEY TERMS

- **Agrobiodiversity:** the variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals. It also includes the diversity of non-harvested species that support production (soil micro-organisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agro-ecosystems (FAO, 1999).
- **Biodiversity:** is the variety of life at genetic, species and ecosystem levels (FAO, 2019).
- **Food and nutrition security:** when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life (UNSCN, 2013).
- **Food security:** when all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 1996).
- **Food systems:** food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries; and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed of sub-systems (e.g. farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g. energy system, trade system, health system, etc.) (FAO, 2018).
- **Indigenous people:** people descended from the populations which inhabited the country or region at the time of conquest or colonisation or the establishment of present state boundaries and who – irrespective of their legal status – retain some or all of their own social, economic, cultural and political institutions (Alan, R. Emery and Associates (1997)).
- **Malnutrition:** refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. The term malnutrition addresses 3 broad groups of conditions: undernutrition, which includes wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age); micronutrient-related malnutrition, which includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess; and overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and some cancers). Citation: WHO Health topics <https://www.who.int/topics/malnutrition/en/>
- **Sustainable food system:** a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases for generating food security and nutrition for future generations are not compromised (FAO, 2018).
- **Traditional and indigenous foods:** foods that are native or were introduced a long time ago, whether locally produced or accessed from the wild; and foods that may be purchased but are recognised as part of a country's traditional food culture (Kasimba et al., 2019).
- **Traditional food systems:** food systems of indigenous peoples composed of items from the local, natural environment that are culturally acceptable (Kuhnlein and Receveur, 1996).

ABBREVIATIONS

AIVs	African indigenous vegetables
CBD	Convention on Biological Diversity
FAO	Food and Agriculture Organization of the United Nations
FRA	Food Rights Alliance
HIVOS	Humanist Institute for Cooperation with Developing Countries
IIED	International Institute for Environment and Development
KRC	Kabarole Research and Resource Centre
NCDs	Non-communicable diseases
PELUM	Uganda Participatory and Ecological Land Use Management
PGR	Plant genetic resources
SDGs	Sustainable Development Goals
SEA	Small East Africa goat
SME	Small and medium-sized enterprise
VEDCO	Volunteer Efforts for Development Concern

SUMMARY

The plight of indigenous peoples has drawn increased attention in recent years as they strive to retain their cultures and protect their ecosystems, lands and food traditions in the face of globalisation. Indigenous food systems are typically biodiversity-rich, climate resilient and environmentally sustainable, and produce nutritious indigenous foods. Yet indigenous peoples are disproportionately affected by hunger and malnutrition, and the shift towards westernised diets high in energy-dense nutrient-poor food has led to rising obesity, diabetes and other non-communicable diseases.

Promoting indigenous plant and animal foods is a means to enhance nutrition and resilience to climate change. Indigenous crops and livestock breeds, and long-cultivated landraces, are often better adapted to local conditions and better able to withstand shocks such as drought than modern high-yielding equivalents. Indigenous varieties and diversified farming systems are also more environmentally sustainable, requiring less water and fewer chemical inputs, thereby helping to sustain the ecosystem services needed to cope with climate change.

The Sustainable Diets for All advocacy programme – coordinated by HIVOS Uganda, IIED and its partners – uses evidence, including that generated by citizens, to improve the food and nutrition status of Uganda’s population. Its focus is on ensuring greater access to sustainable, diverse and nutritious food by protecting and promoting indigenous foods. This report documents the status and importance of indigenous foods and food systems in Uganda in order to inform policies, programmes and action at the local and national level.

Nutrition and indigenous foods in Uganda

Today 4 out of 10 Ugandans are not getting their required dietary intake: 16% of households are chronically undernourished and only 4% are food secure. At the same time, the proportion of overweight adults continues to grow. Non-communicable diseases (NCDs) such as diabetes and heart disease, are a public health concern in Uganda, accounting for 33% of all deaths. Consumption of less nutritious staples like rice, maize and bananas and processed foods is rising in Uganda, while consumption of indigenous foods like millet, wild fruits, indigenous cattle and chicken is declining.

Indigenous foods are high in nutrients and their greater consumption would significantly contribute to the reduction of micronutrient deficiencies and NCDs. Indigenous foods are known to be of high nutritive value compared to exotic foods. For example, a comparison between black nightshade and kale leaves shows that black nightshade has three times more iron and six times more folate.

Uganda has one of the highest levels of animal and plant species diversity in the world. Its plant genetic resources range from little-known indigenous wild fruits and vegetables, animals and medicinal plants, to indigenous staples like millet and sorghum. Indigenous breeds of cattle are the main source of beef in Uganda, constituting almost 95% of the total cattle population. However, indigenous foods are threatened by the introduction of new commercial varieties that are bred to be high-yielding or disease-tolerant. Research and development efforts have focused on promoting the cultivation and use of these so-called ‘improved plant varieties’ at the expense of indigenous food crops and their improvement. The limited information available on traditional and indigenous foods also holds back their use and further action to promote them.



Traditional food handling materials adding value to the Orugali culture (Joseph Muhumuza)

Opportunities for change

The research found that although some national policy documents mention the conservation, production or consumption of indigenous foods, in general this is not very pronounced. However, the focus on these issues in several relevant policies provides a small window of opportunity to advocate for the protection and promotion of the indigenous foods and food systems. There is a need for greater policy advocacy for the implementation of policies that promote indigenous foods, food systems and knowledge.

The rising demand for African indigenous vegetables in urban areas needs to be encouraged and exploited for the benefit

of small-scale producers, traders and retailers in and around cities and in rural areas. Many business-oriented farmers are now cultivating indigenous and traditional crops in urban and peri-urban areas. Supporting small-scale indigenous food processing enterprises is crucial for food and nutrition security and rural development.

The report provides many practical recommendations for implementation at the government, programme and community level. These recommendations need to be implemented at all three levels in order to have an impact and improve production and use of indigenous foods for enhanced food and nutrition security in Uganda.

1. INTRODUCTION

Sustainable Diets for All is a five-year advocacy programme (2016-2020) in Uganda co-ordinated by HIVOS Uganda and IIED. The programme uses evidence, including evidence generated by citizens, to help the population improve their access to sustainable, diverse and nutritious food. The goal of the programme is to work with citizens and partner organisations to influence policies, market practices, government actors and international institutions to promote diets that are diverse, healthy, fair and green.

The programme seeks to bring about policy change in three key areas:

- 1) Healthy and diverse consumption:** raising awareness of and promoting healthy food choices that improve diets.
- 2) Linkages between small and medium enterprises and informal markets:** making the links between the informal food sector and small businesses to help connect cities with rural areas.
- 3) Nutritious and diverse production:** promoting crop and seed diversity including the preservation and promotion of traditional varieties.

Four partners are working with HIVOS Uganda to implement the programme: Kabarole Research and Resource Centre (KRC), Slow Food Uganda, the Food Rights Alliance (FRA) and VEDCO Uganda (Boxes 5 and 6 in Chapter 4). Their activities complement other programmes and case studies promoting indigenous foods in Uganda (Annex 1).

This report documents the status and importance of indigenous foods and food systems in Uganda to inform policies, programmes and actions at local and national level for transforming food systems that deliver sustainable and healthy diets in Uganda. It begins by setting the scene globally and then specifically for Uganda.

1.1 Global biodiversity loss and its implications for diets

Biodiversity is a fundamental element of the Earth's life support system and is the basis for all ecosystem services. It supports many basic services for humans and agriculture – for example fresh water, fertile soils, pollination, pest control and clean air. Biodiversity includes diversity at the genetic level, among species and among ecosystems.

Today 30 crops supply 95% of the calories that people obtain from food globally, with only 4 crops – maize, rice, wheat and potatoes – supplying over 60% (Cook, 2018). The increased reliance on a narrow range of crops and animal breeds has led to the loss of diversity in all species (plants and animals alike), with greater loss in livestock diversity. This loss of biodiversity has greatly affected agricultural landscapes and farming livelihoods in terms of overall productivity, incomes, food and nutrition security, and resilience to climatic and market shocks.

Declining biodiversity has also led to a change in food consumption patterns. Reduced diversity in food systems often leads to reduced diversity on plates and the homogenisation of diets. This can have negative effects on the nutritional status of vulnerable populations, besides the loss of access to wild biodiversity in times of scarcity. With increasing urbanisation, rising population and declining agricultural land, there is growing pressure on available natural resources, and indigenous crops and animal species are quickly being replaced with modern foods in large-scale farms. This trend is also driven by policies and subsidies promoting agricultural modernisation, commercialisation and high-yielding varieties, and by the loss of traditional culture and farming practices amongst indigenous people and local communities (due to modernisation, out-migration for work and education, and policies for education, health, infrastructure, etc). While high-yielding varieties and livestock breeds have contributed to reducing hunger, their nutritional content is lower than traditional landraces and thus increase the risk of micronutrient malnutrition (Cook, 2018).

Many of the crop and animal species that are at risk of extinction are indigenous in origin. The loss of diverse indigenous foods and food systems through the increase in monocultures has heightened vulnerabilities to pests and diseases, leading to greater use of fertilisers and pesticides. One example is the increase of locust and fall army worm invasions of maize fields (and other crops) in the horn of Africa (icipe, 2018).



Fruits (Joseph Muhumuza)

1.2 The global nutrition transition

The world is in the midst of major shifts in dietary patterns towards higher consumption of refined carbohydrates, edible oils, added sweeteners and animal products, often accompanied by reduced consumption of legumes, fruits and vegetables. Often termed the ‘global dietary transition’ or ‘global nutrition transition’, this is having serious health and environmental consequences, including loss of agrobiodiversity and high carbon and water footprints. Indigenous peoples are now disproportionately affected by hunger and malnutrition, with women and girls suffering the greatest burden (Lemke and Delormier, 2017). The shift towards westernised diets and cheap energy-dense nutrient-poor food has led to rising obesity, diabetes and other non-communicable diseases amongst both non-indigenous and indigenous peoples globally (Kasimba et al., 2019; FAO, 2009). The causes are rooted in structural inequalities, lack of access to land and other resources, environmental degradation and biodiversity loss, competing demands for land, policies geared towards commercialisation and planting of exotic foods, shifts in consumption patterns and lifestyles, limited knowledge of the nutritional importance of indigenous foods and centralisation of power in market structures (Cook, 2018).

1.3 Indigenous food systems: what are they and why are they important?

In the context of the Sustainable Development Goals (SDGs), different food systems that could provide solutions in terms of sustainability, resilience, nutrition and environmental management need to be considered in a more integrated manner. It is within this global debate on sustainable food systems that indigenous food systems have gained international recognition (FAO, 2019).

A food systems approach is a way of thinking and doing that considers the food system in its totality, taking into account all the elements, their relationships and related effects. It is not confined to one single sector, sub-system (e.g. value chain, market) or discipline, and thus broadens the analysis of a particular issue to include an intricate web of interlinked activities and feedbacks. The core of a

food system includes a set of activities through which food products flow from production, aggregation, processing and distribution to consumption (including waste disposal), and a set of services supporting the flow (FAO, 2018).

The local food systems that indigenous people have traditionally used may be referred to as ‘indigenous food systems’ or ‘traditional food systems’. These food systems invariably include foods that may also be used by many outside of indigenous cultures. A review of indigenous food systems by the United Nations Food and Agriculture Organization (FAO) described ‘traditional foods’ as “those foods that Indigenous Peoples have access to locally, without having to purchase them, and within traditional knowledge and the natural environment from farming or wild harvesting” (FAO, 2009). Strictly speaking, ‘indigenous foods’ are those derived from indigenous or pre-colonial crops, livestock breeds and wild harvesting traditions; while ‘traditional foods’ can also include non-indigenous elements such as long-cultivated ‘New World’ crops which have developed local landraces (eg. maize and cassava). These crops are largely used for subsistence, but are increasingly sought after in markets with rising consumer demand for healthy and ecological foods.

Currently, greater attention is being drawn to the plight of indigenous peoples as they strive to retain their cultures and protect their ecosystems, food traditions, land and resource rights in the face of globalisation. Indigenous food systems are typically biodiversity-rich, resilient and sustainable, and produce more nutritious foods than modern intensive farming and western food systems.

A forward-looking approach is needed in all sectors to address indigenous peoples’ food and nutrition security, and increase attention on the rights of indigenous peoples to maintain their cultures, environments and preferred food systems. Properly implemented policies can ensure access to highly nutritious traditional, indigenous and local foods and reduce incentives for purchasing poor-quality market foods (especially those with high sugar and saturated and trans-fat contents) and other processed foods (FAO, 2013).

1.4 Food security and nutrition in Uganda

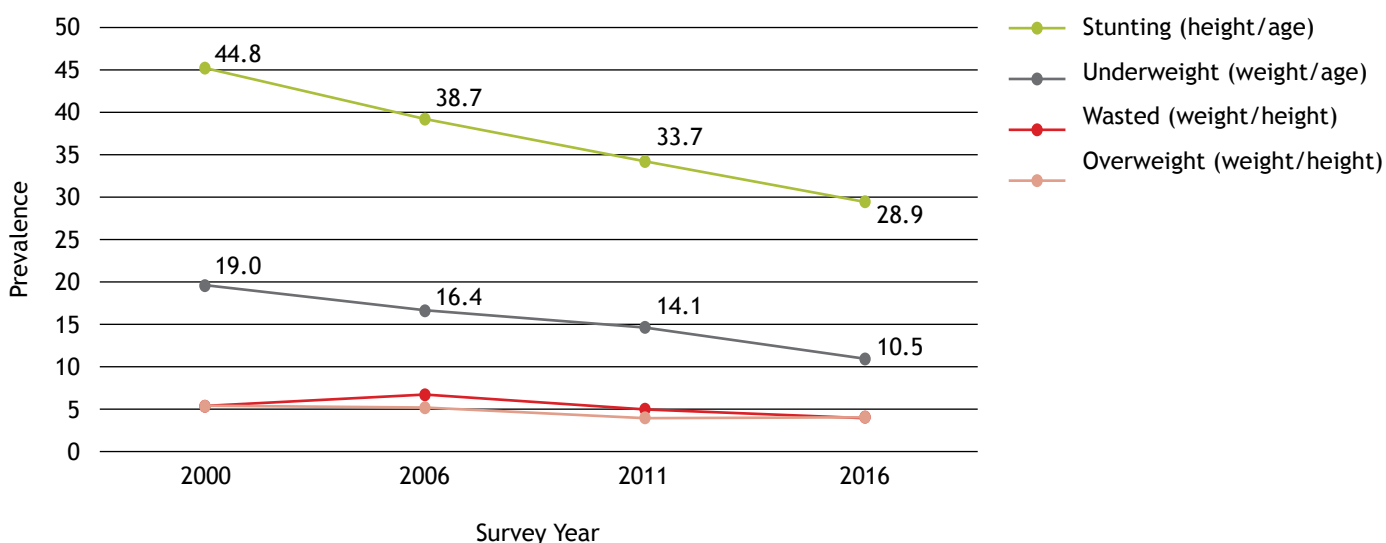
Despite high temporal and spatial rainfall variability, the agro-climatic conditions in most of Uganda are favourable for food production and suitable for growing a variety of plants. The agricultural system is still predominantly smallholder based, using low-cost inputs and traditional labour-intensive techniques. Sixty-six per cent of Uganda’s population directly derive their livelihoods from agriculture (PELUM, 2014).

In April 2019, the food security situation was deteriorating in much of the Eastern region and parts of the Northern and Central regions of Uganda. Poor households had exhausted their food stocks by March, and below-average first season (March-June) rainfall meant an absence of seasonal vegetables and a significant decline in agricultural labour demand, reducing household income and food access more significantly than anticipated. Poor rainfall interrupted seasonal agricultural activities and halved the normal growing period, affecting productivity. By September 2019, it was anticipated that only crops that mature over a 60-day period were likely to reach maturity, which excludes cereal and legume varieties that mature over 90-140 days (Famine Early Warning Systems Network, 2019).

Most of Uganda’s agricultural production is rainfed, meaning that about 85% of the population is vulnerable to the negative impacts of climate change on their food and nutrition security. Frequent incidences of drought and extreme rainfall events are causing widespread damage to lives and livelihoods. The most severe impacts are in agriculture-related sectors and include reduced crop and animal productivity, likely to affect food and nutrition security; loss of biodiversity in agricultural landscapes, leading to reduction in yields; and increased food shortages and famine risks, leading to poor human health and increased malnutrition (Nyasimi et al., 2016).

With an estimated population of 40.3 million, stunting levels in Uganda are 28.9%, while 3.7% of under-fives are overweight. Average daily calorie consumption stood at 1,883 kilocalories (kcal) in 2016 (Government of Uganda, 2016), an estimated 75-90% of the recommended requirements. About 2 in 10 (24%) non-pregnant women aged 15-49 years are obese or overweight (with a body-mass index greater than 25). One-third (34%) of urban women are overweight or obese, compared to one-fifth (20%) of rural women (Government of Uganda, 2016). However, undernutrition in Uganda is declining (Figure 1).

Figure 1: Trends in malnutrition in Uganda, 2000 to 2016



Source: Government of Uganda, 2016, *Uganda Demographic and Health Survey, 2016*



Cookery demos by Orugali women (KRC)

Globally, non-communicable diseases (NCDs) account for 41 million deaths annually, equivalent to 71% of all deaths. In Uganda, NCDs are a public health concern, accounting for 33% of all deaths. For example, in 2016, there were an estimated 97,600 NCD deaths in the country (WHO, 2018). According to the 2014 Ugandan Stepwise survey, about one in four people (24.3%) were regarded as having raised blood pressure. The prevalence of raised fasting glucose including diabetes was estimated at 3.3% overall. The prevalence of raised total cholesterol was estimated at 6.7% (MoH et al., 2014).

Transformations in Uganda's food systems are posing increasingly significant challenges to the health and nutrition status of the population. These include the wide availability and consumption of highly processed, high-calorie, high salt and low nutritional value food items – along with limited access by small-scale producers and agri-enterprises to viable markets; high levels of food loss and waste; and increased incidences of food safety and animal health issues.

A 2008 food consumption survey found that Uganda's population had inadequate intake levels of five vitamins and minerals critical to good health: vitamin A, vitamin B-12,

iron, zinc, and calcium (Harvey et al., 2008). The report also showed that the Ugandan diet is predominantly vegetarian; only 11-13% of the energy is supplied by foods of animal origin. Most dietary energy comes from plantains and roots or tubers (425 to 700 g/day).

Amongst the key risk factors for NCDs are low consumption of fruit and vegetables, high salt and sodium intake and physical inactivity. The Stepwise survey showed that consumption of fruit and vegetables is low, with 27% of the population not having eaten fruit or vegetables in the week preceding the interview. It also found that 87% of females and 88% of males consumed less than five servings of fruit or vegetables per day (MoH et al., 2014). In this context, it is important to note the disease-prevention role played by healthy diets, including indigenous foods that are highly nutritious and are strongly believed to have other health benefits. The advantages of indigenous foods include: a sense of reconnecting with one's roots; higher nutritional value than their exotic counterparts; and a resilient and sustainable food source, especially in the face of climate change (De Bruin et al., 2018).

2. INDIGENOUS FOOD AND FOOD SYSTEMS IN UGANDA

Uganda ranks among the ten most biodiverse countries in the world – although occupying only 2% of the world’s area, it has a record 18,783 species of fauna and flora. For example, there are 37 families of indigenous edible fruit trees in Uganda, represented by 75 species. As a Party to the Convention on Biological Diversity (CBD), Uganda is committed to reducing and eventually reversing the rate of biodiversity loss, for the benefit of all Ugandans (Pomeroy et al., 2017). It is estimated that the country is losing about 10-11% of its biodiversity each decade. Although there is no complete record of the status of agrobiodiversity in Uganda, of the estimated 1,400 indigenous plant species (many of whose potential is yet to be exploited), 30 species are known to be endangered, 43 are rare and 10 are vulnerable (Bioversity International, 2019).

Indigenous and traditional food plants and livestock breeds have always ensured food and nutrition security and are still widely consumed in Uganda, but are being progressively replaced by exotic foods and modified crop varieties.

Indigenous cattle breeds play a very important role in the lives of many Ugandan farming communities, traditionally providing a number of foods, draught power, clothing and bedding and building materials, and performing various cultural functions. Furthermore, they are the main source of beef in Uganda, and constitute almost 95% of the total cattle population. There are approximately 4 indigenous cattle breeds, 3 indigenous goat breeds, 3 indigenous sheep breeds, and 3 indigenous poultry breeds. Exotic and cross-breeds are however becoming increasingly popular. There is some concern that indigenous breeds are being undermined as land becomes scarcer and demand for high-yielding breeds increases. It is believed that the country has lost 12 breeds of cattle, 3 goat breeds and 1 sheep breed over the last century.

Several types of food are obtained from indigenous and traditional plants, growing either in the wild, or naturalised or domesticated. Leafy greens such as Amaranths (*Amaranthus* species), prepared fresh or dried, comprise the majority of indigenous vegetables (see Annex 2). Vegetables are eaten frequently to accompany a cereal

or root crop staple food. Seeds and pulses such as cowpea and ground nuts are prepared as side dishes or sauces and soups. Sometimes they are roasted and eaten as snacks (Osiru, 2006).

Detailed information on the indigenous and traditional food plants of Uganda – including scientific, English and local names, where they are grown, parts eaten and uses – is provided in Annex 2. Below we list the main groups of indigenous and traditional plant and animal foods found in Uganda:

- **Cereals:** millet, sorghum, traditional maize varieties.
- **Roots and tubers:** yams (a range of varieties), Livingstone potatoes, cocoyam, tania, cassava, sweet potatoes.
- **Legumes and pulses:** climbing beans, bambara nuts, ground nuts, wild cowpea.
- **Vegetables:** amaranth (a range of varieties), African spider plant, African eggplant, black nightshade, bitter berries, local cherry tomatoes, cho-cho etc.
- **Fruit:** guavas, carandas plums, cape gooseberries, jack fruits, sour sop, African breadfruit, and dessert dates.
- **Animals:** **cattle:** Ankole, Nganda, Zebu; **goats:** Small East Africa (SEA), Mubende, Kigezi, Karamoja goats; **sheep:** the Masai, the East African Black head, and the East African long tailed; **turkeys:** indigenous Ugandan Turkey etc. (FAO, 2004).

2.1 Indigenous peoples

Some of Uganda’s indigenous peoples include: the Batwa (population of about 6,700, mainly in the southwest), the Benet (population of about 8,500, in the northeast), the Ik (population of about 13,939, on the edge of Karamoja/Turkana region at the Uganda-Kenya border), Karamojong (population of about 988,429, in the northeast), and the Basongora (population of about 15,897, in the lowlands adjacent to the Rwenzori mountains in the west of the country). Their main challenges include lack of land tenure security, forced evictions and marginalisation in political representation. As a result, they continue to live in impoverishment and social and political exclusion (IWGIA, 2019; UOBDU et al., 2015).



Sweet Potatoes (Layata) (Joseph Muhumuza)

Many non-indigenous rural communities also cultivate indigenous crops and landraces and manage local seed systems, based on traditional and local knowledge. Indigenous people and local communities are custodians of much traditional knowledge on plant genetic resources (PGR), but documentation of this knowledge and inventories of under-exploited plants are poorly developed in Uganda.

2.2 Production systems for indigenous foods

Indigenous production systems are based on agroecological practices that protect soils and keep them healthy. Indigenous peoples traditionally respect and protect soils as ‘Mother Earth’, have a deep and sophisticated understanding of nature and the properties of soils, and know that the foundation of productivity, cultivation and diversification of crops for food and medicine, as well as raising livestock, is a healthy living soil (PELUM Uganda, 2015).

Most indigenous crops and landraces are well adapted to drought and local conditions, and grow with little or no assistance (ie. without human intervention), making them good for community resilience to drought and food insecurity. Yams are a good example, especially in Uganda. The local variety (Balugu) is known to stay dormant in soils and can even regenerate after ten years. Similarly, with cassava, farmers practise ‘storage avoidance’ whereby they only uproot cassava when they need it for a meal that day or the following day. Farmers also attest that they prefer to plant traditional simsim (sesame) varieties as they do not need pesticides (‘scientific drugs’) (Whitney and Gebauer, 2014).

Ugandan homegarden systems are known to be sustainable small-scale solutions for food security and conservation.

They contain a great diversity of indigenous plant species and act to preserve associated and time-tested traditional knowledge for nutrition and conservation. They hold many under-utilised food plants. Strong potential exists for the expansion of homegarden biodiversity and the promotion of indigenous plants (Whitney and Gebauer, 2014).

Between 1987-89 and 1995-97 sweet potato production in Uganda rose from 1.7 to 1.9 million tonnes, or slightly over 12%. During the same period, maize output jumped by 70% and matooke production (cooking bananas) increased by an estimated 1.9 million tonnes. In contrast, cassava production fell from 3.3 to 2.2 million tonnes, or roughly 32%. Hence, sweet potato is assuming slightly greater importance in domestic food supplies than previously (Scott et al., 1999).

A 2017 study in Lira district showed that cowpeas, hibiscus spp., pumpkins and crotolaria (a tropical legume) were reportedly more commonly cultivated indigenous and traditional vegetables than the spider plant and jute mallow. In contrast, spider plant, jute mallow and amaranths are the only African indigenous vegetables which are never planted – they grow by themselves whenever a conducive environment prevails (Bua and Onang, 2017). However, the reduced access to land, the growing cost of traditional staple foods (such as matooke) compared to the cost of growing maize, has seen maize consumption increase, especially in urban areas.

2.3 Indigenous seed systems in Uganda

Seed is the most fundamental resource as it ensures continuity season after season and is therefore key to improving the livelihoods of smallholder farmers. However, farmers’ self-reliance in seed and other planting materials



The millet grinding stone used to grind millet for porridge and millet bread (Joseph Muhumuza)

in Uganda is continually being undermined by both natural (e.g climate change) and manmade effects (e.g conflict, fake or poor quality seed on the market, promotion of hybrid seeds that need to be bought each season, and the potential threat posed by genetically modified organisms) (PELUM Uganda, undated).

The seed sector in Uganda has evolved. Critical changes include shifts in the custodianship of seed from farmers (who saved and reused their own seed) to seed companies (meaning farmers must buy seed from input dealers), and control of seeds by national bodies and multinational companies. Today there are fewer seeds for indigenous crop varieties compared to exotic varieties, which is a sign of the declining number of varieties that farmers have available for taking care of biodiversity, food and nutrition security. However, many rural communities still use community seed banks as a mode of seed storage (PELUM Uganda, 2010).

Communities like the Iteso indigenous people of Eastern Uganda have a clear concept of selecting seeds. In the case of sorghum, those that are kept specifically for use as seed are differentiated and selected at the time of threshing and kept for planting the following year. For simsim (sesame), smaller quantities of grains are selected and kept in gourds (Etuwo) (PELUM Uganda, 2011).

2.4 Processing and preservation of indigenous foods

Food processing and preservation in one form or another has been practised from ancient times to prevent food waste and to ensure communities have foods all year round. For centuries households have processed or preserved some food for later use (Aluga and Kabwe, 2016).

Local processing methods for indigenous and other foods include grinding grains and legumes to produce powders;

pounding vegetables and fruit; soaking and germination; soaking in water, drying and pounding – mostly for cassava (Walingo, 2008).

Documentation of traditional food processing and preservation methods for indigenous foods in Uganda is very limited. Examples include:

- Around the 1960s, the intermixing of cultures in Uganda introduced new foods and storage technologies into communities, including granaries made from a special grass called eteete (*Symopogon*) to wrap cereals, which were also mixed with wood or bean husk ash in order to prevent attack by pests (PELUM Uganda, 2011).
- In some Ugandan communities, some traditional foods like sweet potatoes (amuokeke) are peeled and sliced, then put in the sun to dry and stored dried in the granary. Other farmers noted the use of red-pepper (pili-pili) to keep and protect beans from pests, as well as fully sun-drying legumes before storage and mixing them with ash (PELUM Uganda, 2011).
- A study in Rukungiri region of Uganda showed that sun-drying is the principal mode of extending the shelf-life of food commodities in the region. The majority of respondents used sun-drying for food preservation, though mostly for cereals rather than fruit and vegetables (Musinguzi, 2006).

Wild plums (*Carissa edulis*), wild gooseberries (*Physalis minima*) and amashararazi (only found in parts of Kihiihi area) have potential for industrial exploitation for flavonoid extracts. Flavonoids have been strongly implicated as contributors to health benefits in tea, wine, fruits and vegetables, and have a high price in the global market as food supplements, and in the case of amashararazi, for wine processing (Musinguzi, 2006).



A winnowing basket covered with steamed banana leaves with yams served (Joseph Muhumuza)

Food preparation is a critical component of the day to day activities of a community. Box 1 presents preparation methods for some key local and indigenous foods in Uganda (PELUM Uganda, 2011).

Simple, low-cost, low-carbon traditional food processing techniques are the bedrock of indigenous communities' food and nutrition security. Small-scale food processing enterprises are crucial to rural development. Building the capacities of local communities in food processing and preservation, as well as providing support to set up small-scale food processing industries, will contribute to community development through increased income opportunities, the greater availability of diverse foods in the markets and reduced food losses. More attention needs to be given to this area.

2.5 Marketing systems for indigenous foods

Although most indigenous foods are generally grown in rural areas or found in the wild, many business-oriented farmers are now cultivating indigenous and traditional crops in the urban and peri-urban areas of Uganda and selling them to urban dwellers, who are becoming more conscious of the health benefits of indigenous foods (described in the next chapter).

This increasing demand needs to be encouraged and exploited for the benefit of small-scale producers, traders and retailers in and around towns and cities, and indigenous communities in rural areas producing organic or ecological indigenous foods using traditional practices. The indigenous food business (especially vegetables) is unique because profitability and consumer demand are rising in most urban

Box 1. Preparation methods for some of the most commonly used indigenous foods

- **Most vegetables** are prepared by steaming (sometimes in banana leaves) or by adding groundnuts or simsim paste before pounding and cooking. Some are eaten as side dishes or as a full meal.
- **Groundnuts** are roasted and pounded before they are added to leafy green vegetables. Dried groundnuts are shelled and pounded and mixed with boiled water to prepare a sauce called ekinyeebwa, with other ingredients added as preferred.
- **Yams** are mostly prepared by steaming in banana leaves. The steamed yam is peeled before eating and should not be dipped into a salted sauce or vegetable as this is believed to interfere with the fertility of the subsequent crop of yams. In Buganda, it is also believed that the tubers from the subsequent crop would be bitter if one ate yams with salt.
- **Sweet potatoes** are usually boiled or steamed. The sweet potatoes are eaten with sauce or vegetables. Sometimes they are roasted or baked in hot ashes or clay blocks. They can also be prepared and mixed with beans, a recipe called omugoyo in Luganda. Potato is also commonly processed into dry chips, commonly called amukeke in Ateso.
- **Cassava** is considered a good famine crop. It can be steamed/boiled/roasted. In eastern, northern and western region, cassava flour is used as a composite with millet and sorghum for making the staple local bread eaten with a sauce. In Teso-Amuria the main staple is called atap, made from the mixture of millet/sorghum with cassava flour. It can also be made from dried sweet potato and mixed with sorghum/millet (called eduda).
- **Beans:** Peas and beans or bambara nuts are washed and boiled until almost soft. Peeled sweet potatoes chopped into small pieces are then added to the peas or beans. When the food is soft, it is mashed and served. This dish is called emangor and is fed mainly to children.

Source: PELUM Uganda (2011)



Amatehe. One of the tropical plants that grow on their own. They help to cleanse the digestive system (Joseph Muhumuza)

centres in the region. However, farmers often face barriers to the profitability of agricultural enterprises, including lack of transport, exploitation by middlemen and lack of market information. Partnerships between high-value chain stores (supermarkets) and groceries could give small-scale producers a platform to participate in the highly competitive horticultural business.

Markets for indigenous foods can be either formal, informal or non-monetary (eg. exchange on indigenous territories). Formal markets include large organised markets such as supermarkets, wholesale, retail groceries, as well as free markets in rural and urban centres. Informal markets are characterised by several market players, and lack product information and formal market institutions (Muhanji et al., 2011).

In terms of packaging, most indigenous foods, especially vegetables, are sold loose in heaps, bundles, baskets, buckets, bags and sacks. Packaging is minimal, consisting mostly of string which traders use to tie up the produce in bundles when sold to final consumers. Fruit and vegetables such as African eggplant, pumpkin and okra are sold either in heaps, bowls or buckets (Weinberger et al., 2009).

A study undertaken in 2009 examining production and commercialisation of various cultivated indigenous vegetables grown, found that in Tanzania, African indigenous vegetables (AIVs) contributed 13% of all farmers' household income on average. In the Kiambu District (Kenya) the study showed how farmer groups had successfully penetrated the high-value segment of markets for leafy indigenous vegetables through collective action and collaboration with a support system (Weinberger et al., 2009).

Around 50% of the market actors in Uganda collectively purchase AIVs in bulk. A survey in Rukungiri district revealed that even when sourced from the wild, some indigenous food plants make a contribution to household incomes, especially in poor households. Key vegetables identified as crucial for income generation included the amaranthus family (*Amaranthus dubius*, *A. graecizans* and *A. hybridus*) and three species of indigenous fruits: *Fromomum angustifolium* (Amatehe), *Solanum gilo* (Etonga) and *Cleome gynandra* (Eshogi) (Musinguzi et al., 2006).



Matooke (left) and Emikakaaro (peeled and dried matooke) (right). Emikakaaro can be kept for a long period and is usually utilised in times of drought (Joseph Muhumuza)

2.6 Consumption trends of indigenous foods

While the rise in consumer demand for indigenous foods in Uganda indicates growing consumption in urban areas, there is limited documentation of consumption trends of indigenous foods amongst poor communities. The Hivos research has started to document this consumption using the food diaries approach (Box 2). A study in Rukungiri and Kanungu districts of Uganda attempted to document the frequency of consumption of various indigenous food plants among local households living in these two districts. In general, leafy indigenous and traditional vegetables were much more frequently consumed than fruit or other indigenous foods. The most popular vegetables included

Eshwiga (*Solanum nigrum*), Entonga (*Solanum gilo*), Ekishuusha (*Cucurbita maxima* leaves) and the Amaranthus species *Amaranthus dubius*, *A. graecizans* and *A. hybridus*. The most frequently gathered and preferred fruits were the wild plums (*Carissa edulis*) and wild gooseberries (*Physalis minima*) (Musinguzi et al., 2006).

There is an increase in consumption of staples like rice, maize and bananas. Farming communities are becoming more market-oriented, leaving very little food for the households to consume. There is near extinction of some indigenous crops, particularly millet and some vegetables, which are being replaced with less nutritious exotic options.

Box 2. Using food diaries to record consumption patterns in Fort Portal

One of Hivos' partners, KRC, has been using food diaries and other innovative methods to understand the food consumption patterns of communities in the urban centers and rural areas of Fort Portal.

In addition to recording food diaries (see below), data collection involved undertaking focus group discussions around a 'traditional meal', known locally as Orugali. Orugali is an innovation in the investigation of food and nutrition and is designed to provide a practical opportunity to engage on nutrition issues during a meal. One family volunteers to host the Orugali – the host household prepares a meal and invites people in the neighborhood to eat together as discussions go on about food and nutrition. The Orugali process can also involve cookery demonstrations to show preparation methods for local indigenous foods.

The food diary study, undertaken in 200 households across 10 sub-counties, found that many households grow a wide range of foods for consumption; eaten in combination these create balanced meals for most households. Food grown locally includes: matooke, millet, yams, pumpkins, cassava, potatoes, a wide range of pulses, vegetables and fruit trees.

Food consumption score data revealed that 11.6% of households exhibited poor food consumption, while another 47.7% were borderline, meaning food consumption was not satisfactory. The factors behind poor diets identified in the focus group discussions were: time constraints; limited household labour to support family food production; limited knowledge of traditional food processing; excessive selling of food produced; limited varieties of foods cultivated; limited nutrition knowledge; seasonality of foods; and poor yields of planted crops.

The study also revealed the important emerging role of street food consumption in meeting the population's food and nutrition needs. It found that "street food is likely to remain a food system for the growing poor urban population amidst competing opinions about its stay but more than that, it was discovered that food has the potential to play an increasingly dominant role in the local economy but this opportunity is not grasped as yet and hence not planned for".



Chicken with cowpeas and egg plants served in a pot (Joseph Muhumuza)

2.7 Gender roles in indigenous food systems

Men and women have different roles and responsibilities in the agricultural system in Uganda. Women have more responsibility for maintaining household food security, while men are more focused on managing seeds of marketable value. Overall, women have a greater labour burden than men, including a higher proportion of unpaid household responsibilities related to preparing food and collecting fuel and water (FAO, 2011). In most communities, production of indigenous foods has been left to women, mostly older women. Women are heavily involved in production on farms and in small kitchen gardens for home consumption and local seed management. When indigenous and traditional crops have economic value, the role of men increases – especially in marketing of the crop, mostly at wholesale level. However, the actual selling (retailing) of the vegetables, root crops and cereals in markets is done by women (PELUM, Uganda, 2011).

Women are also heavily involved in local processing of indigenous foods – drying, grinding and food preparation. It is generally believed that women have more knowledge of indigenous vegetables and cereals than men because women are traditionally responsible for household food production, processing and preparation. However, men have a vast knowledge of wild fruits and edible roots that they harvest while taking animals to graze (PELUM Uganda, 2011).

There seems to be a slight increase in the involvement of youth in production systems, especially in urban and peri-urban regions. The youth are mainly involved in production through improved technologies as well as in selling of crops. More young men provide farm labour than young women (PELUM Uganda, 2011). However, there seems to be a knowledge transfer gap from the older generations to the

younger generations, who have limited knowledge about indigenous foods.

Gender-based inequalities along the indigenous food production chain must be removed and inter-generational transmission of traditional knowledge enhanced. Active engagement of women and youth at all levels of decision making is absolutely necessary to attain food and nutritional security.

2.8 Threats to indigenous foods

Genetic erosion of many indigenous species is occurring at an alarming rate as Uganda modernises its agriculture with an emphasis on exotic species and improved varieties.

It was reported that before 1953, in Central Uganda communities depended on matooke (cooked bananas) as the main food and also consumed indigenous vegetables such as bitter berries and African eggplant, and pulses such as cowpeas and bambara nuts. However, after a severe drought, communities were forced to diversify their food production into other root tubers like sweet potatoes, cassava and yams to reduce food deficits. This was the beginning of the introduction of modern foods. The communities started engaging in trade, and foods that were initially for home consumption were now being sold, leaving very little for families to consume. This led to a reduction in the production and consumption of indigenous foods (PELUM Uganda, 2011). Due to the drive for profits, and government policy promotion of exotic crops, many farmers started producing exotic crops that were much faster maturing.

Some regions in Uganda are losing their agrobiodiversity more quickly. In Kabale, some traditional crop varieties are no longer available – a number of varieties have disappeared, especially varieties of sweet potato, bean

and field pea (Osiru, 2006). The decline in production and consumption of indigenous plants and animal breeds can be partly attributed to limited scientific knowledge of their nutritional content and to the emphasis placed on commercial, high-yielding exotic plants and breeds by researchers, agricultural extension officers and policy makers (PELUM Uganda, 2011). Home gardens in Uganda, which normally contain a wealth of indigenous crops, are also on the decline, mainly due to social and economic pressures. A study in Nawaikoke sub-county found that indigenous species of several crops are depleted and most face threats through destruction of seedlings and saplings. In Kamuli district, it was found that smaller holdings are generally more intensively cultivated than large and very

large holdings, and fragmentation of land eventually makes some of the holdings so small and uneconomical that people move away from farming (Whitney and Gebauer, 2014).

Current policies and legislation for managing biodiversity are inadequate. The existing land tenure systems of land holdings, leasehold and customary holdings offer little incentive for protection and management of biodiversity. Maintenance of habitats and species depends on individual landowners. Yet private landowners and communities could play a significant positive role in managing biodiversity (agricultural and wild) given the right incentives. Box 3 contains a summary of key threats and opportunities for indigenous foods in Uganda.

Box 3. Threats and opportunities for indigenous foods in Uganda

Threats

- Replacement of local crop varieties by introduced commercial varieties with disease resistance (e.g. disease-resistant varieties of banana, instead of traditional banana species; cassava landraces are scarce because of cassava mosaic disease).
- Poverty, which forces people to sell the best animals (most of which are indigenous); few are conserved.
- Increasing problems of invasive crop weeds.
- Climatic change, leading to drought, diseases, pests, famine, among others.
- The information gap on traditional and indigenous foods threatens their extinction as it limits their use and further action to promote them.
- The unrecognised role of women in indigenous food systems, coupled with injustices and marginalisation faced by women in many rural areas, have exacerbated the loss of indigenous plant and animal varieties in Uganda.
- Competition for land with commercial crops, exotic animal breeds and other forms of land use such as construction, has led to disappearance and extinction of some indigenous foods and the genetic erosion of indigenous plant and animal genetic resources
- Complicated processing methods compared to exotic foods. For example, in West Nile processing wild yams (*Kinjo*) harvested from the mountains involves peeling and boiling the tubers, placing them by the riverside for fermentation to 'wash away' the poisonous substance, re-boiling and mashing. This crop is therefore limited to seasons of famine and has been overtaken by foods which are easier to prepare.
- Loss or neglect of traditional varieties – millet, cowpeas, pigeon peas, Lima and Bambara beans,

and wild medicinal plants and local fruits and vegetables – e.g. ginger lily through wetland destruction; Cape gooseberry by overgrazing and introduction of exotic species such as tomatoes and cabbages; and disappearance of indigenous sorghum varieties as seeds have not been kept.

- Marginalisation of indigenous foods as the current formal education systems in Uganda rarely incorporate indigenous knowledge.
- Focus of research and development efforts on promoting the cultivation and use of improved plant varieties at the expense of indigenous food crops and their improvement.

Opportunities

- Strengthen capacity building in plant inventory techniques, developing and maintaining plant databases, boosting law enforcement, and plant conservation and sustainable use at national and community levels.
- Build awareness among communities on the need to protect indigenous plant and animal species.
- Promote sharing and documentation of men and women's indigenous knowledge and practices for cultivation, processing, cuisine and protection of indigenous species.
- Support domestication of local and indigenous plants and animals.
- Implement strategies to protect indigenous (and endangered) plants and animals both in public and private spaces.
- Improve local facilities for conservation of plant and animal genetic resources.

Sources: FAO (2018); Government of Uganda (2016); MoH et al. (2014); WHO (2018).

3. WHY ARE INDIGENOUS FOODS AND FOOD SYSTEMS IMPORTANT?

Indigenous foods have been proven to be of high nutritive value and their contribution to improved health and nutrition is significant. For example, most indigenous vegetables are higher in micronutrients than exotic vegetables. They are also an inexpensive source of a balanced diet. They are an integral part of the cultural identity of indigenous peoples and are used for various cultural practices and nutritional functions. They are also resilient, being tolerant to stress such as drought and pests and hold great potential to contribute to communities' nutrition and food security.

This chapter summarises the many benefits and potential of indigenous foods.

3.1 Indigenous foods play in important health and nutrition role

The health and nutrition benefits of indigenous foods cannot be over stated. According to a study carried out by PELUM Uganda, all communities are aware of the medicinal properties of different indigenous foods, and recommend them to patients and those recovering from sickness. However, the young generation is now more prone to diseases such as hypertension and cancers due to lower consumption of indigenous fruits, vegetables and local varieties of root crops such as yams (PELUM Uganda, 2011). Although African indigenous vegetables (AIVs) form a significant and inexpensive source of a balanced diet for poor rural households in Africa, vegetable consumption is often regarded as a poor man's diet and nutrients are destroyed during cooking, reducing their effectiveness in ensuring food security (Bua and Onang, 2017).

Some of the key indigenous dark green vegetables found in Uganda, such as *Solanum nigrum* (Black nightshade or Nsugga in Luganda) and *Cleome gynandra* (Spider plant), have higher nutritive values than exotic vegetables such as cabbage (Table 2). It has been recommended that promoting their consumption among the poor could go a long way

towards addressing nutritional deficits. Moreover, most traditional African foods (including those found in Uganda) have other uses, such as for treating ailments including stomach pains, peptic ulcers, headaches, anaemia and scabies (PELUM Uganda, 2011).

Consumption of indigenous fruit and vegetables is known to contribute vital antioxidants, which prevent chronic diseases such as diabetes and hypertension (Bua and Onang, 2017). Indigenous fruit and vegetables have also been promoted to improve nutrition and help reduce opportunistic infections resulting from HIV/AIDS. Furthermore, fruits such as Kitaferi (Luganda) are believed to be useful in the treatment of cancer (PELUM Uganda, 2011).

Nutritional value of various indigenous foods

Very few indigenous foods in Uganda have been analysed in detail for their nutritional content; or if they have been analysed the results are not readily available. Table 1 therefore presents data from the 2018 Kenya Food Composition tables for similar indigenous foods found in Kenya.

Most indigenous food crops, as shown in Table 1, are rich in key essential nutrients. Key micronutrient deficiencies in Uganda include iron, zinc, Vitamin A, Vitamin B12 and calcium. The indigenous crops in Table 1 have substantive amounts of these micronutrients – groundnuts for example are high in calcium and iron. These are crucial for the prevention of micronutrient deficiency diseases such as osteoporosis (weakening of bones) and iron deficiency anemia, among others. These crops are also relatively high in calories and usually have a low glycemic index, which is crucial in blood sugar control and control of non-communicable diseases such as diabetes.

Table 2 compares the nutritional values of indigenous vegetables found in Uganda with exotic vegetables.

Table 1. Examples of nuts, root tubers and fruits and their key nutrients (per 100gm of edible portion)

Selected nutrients	Bambara groundnut, dried, raw	Nut, groundnut, with skin, unsalted, dry, raw	Yam, white, raw	Jackfruit, fruit, yellow fleshed, peeled, raw	Date, raw	Guava, pink-fleshed, raw
Energy (kcal)	321	593	112	95	152	48
Protein (g)	18.1	20.1	1.9	1.4	1.6	1.1
Fibre (g)	28.2	8.3	4.1	2.8	1.8	15.5
Calcium (mg)	39	117	16	35	34	20
Iron (mg)	3.3	5.5	0.8	0	0.3	0.4
Zinc (mg)	1.81	2.24	0.27	0.76	0.2	0.26
Vit A (RAE) ^a	0	0	0	7	2	22
Vit B12 (mg)	0	0	0	0	0	16
Food folate (mcg) ^b	—	110	16	19	25	16

Notes: ^a RAE: retinol activity equivalents; ^b Mcg: microgram

Source: FAO/Government of Kenya. 2018. *Kenya Food Composition Tables*. <http://www.fao.org/3/I8897EN/i8897en.pdf>

Table 2. Nutritional values of selected indigenous and exotic vegetables (per 100g of edible portion)

Selected nutrients	Indigenous vegetables			Exotic vegetables		
	Amaranth leaves, raw	Spider plant leaves, raw	Black (African) night shade leaves, raw	Cabbage leafhead, white, raw	Spinach leaves, raw	Kale leaves, raw
Energy (kcal)	36	43	31	76	27	29
Protein (g)	3.7	4.8	3.8	1.1	2.8	3
Fibre (g)	7.2	4.3	4.3	2.2	4.1	4.7
Calcium (mg)	280	189	100	47	131	402
Iron (mg)	6.8	2.6	8.6	0.5	1.7	2.8
Zinc (mg)	0.92	0.76	0.65	0.2	1	0.5
Vit A (RAE)	326	186	2	tr	189	177
Vit B12 (mg)	0	0	0	0	0	0
Food folate (mcg)	64	165	404	15	110	62

Source: FAO/Government of Kenya. 2018. *Kenya Food Composition Tables*. <http://www.fao.org/3/I8897EN/i8897en.pdf>



Yams (Joseph Muhumuza)

If cabbage and amaranth leaves are compared, it is evident that amaranth has 3 times more protein and fibre, about 7 times more calcium, 13 times more iron, 4 times more zinc, about 300 times more vitamin A, and 4 times more folate. Comparison of black nightshade and kale leaves shows that black nightshade has 3 times more iron and 6 times more folate. Amaranth also has low phytate level, of 5mg per 100g edible portion. Phytate is a substance that binds minerals and reduces their availability.

On average the data show that indigenous vegetables have slightly higher protein content than the modern vegetables. The fibre content is almost equal across both groups, but amaranth leaves have the highest fibre content. In terms of micronutrients, the iron and folate levels of indigenous vegetables are significantly higher than those of modern vegetables. Thus, indigenous crops can be considered nutritionally superior to modern vegetables.

Looking at indigenous animal food products, milk from indigenous cattle has a higher fat content than milk from exotic breeds. Furthermore, recent studies have found that indigenous chicken meat carries better physicochemical and sensory parameters (e.g. water retention capability, taste, smell, etc.) than meat from commercial broiler chickens; and indigenous chicken eggs have high mineral and fat contents (FAO and University of Peradeniya in Sri Lanka, 2019).

3.2 Indigenous food systems enhance resilience

Reducing malnutrition is crucial for strengthening resilience because well-nourished individuals are healthier, can work harder and have greater physical reserves. Households that are nutritionally secure are thus more resilient – better able to withstand, endure and recover from external shocks (FAO, 2014).

Building resilience in food systems needs to focus on food and nutrition security, institutions and markets, as well as production systems. The traditional role of agriculture in producing food and generating income is fundamental, but considering the entire food system – from inputs and production through processing, storage, transport and retailing, to consumption – can contribute much more to the eradication of malnutrition (FAO, 2013).

The role and diversity of indigenous and traditional foods allows farmers to respond to different challenges and shocks and improve food and nutrition security, particularly for women and children who are most vulnerable to nutrition deficiencies (PELUM Uganda, 2016). For example, communities in Lira District of Uganda mentioned that their most common reasons for cultivating or collecting AIVs were for food, medicine, their nutritive value, and their resilience to adverse weather conditions and resistance to pests and disease (Bua and Onang, 2017).

Numerous indigenous, neglected and underutilised species (e.g. African eggplant, African spider plant, bambara nuts, bitter berries and sour sop, millet and ooster nuts) are known to be tolerant to stress such as drought and pests. They therefore hold great potential to contribute to the resilience, nutrition and food security of communities, particularly in agriculturally marginal areas because they are well adapted to local agro-climatic conditions (PELUM Uganda, 2016). For example, foods such as yams are usually valuable dry-season foods and are preferred to meet peoples' food needs in times of famine. They are popular because they can be stored in the soil for a long time and can be harvested when needed. For poor households who lack resources, the yam is therefore an easy solution (Bua and Onang, 2017).



Indigenous goat breed Slow food

Farmers in Nakasongola and Mubende districts agree that there have been several seasonal changes in recent years that can be linked to climate change and variability. The farming households have been able to ensure food and nutrition security in their homes by building granaries to store food reserves; growing food crops that stay in the garden for a long time especially root crops like cassava, sweet potatoes and yams; and setting up kitchen gardens in order to grow diversified foods for household use (PELUM Uganda, 2010).

It has been shown that hunger and poverty alleviation does not always depend on new crop varieties that are bred in laboratories. Reigniting interest and taste for indigenous and

traditional foods can help improve nutrition and income, restore biodiversity and improve community resilience and poverty alleviation (Bua and Onang, 2017).

3.3 Indigenous foods have important cultural significance

Indigenous foods and foodways are an integral part of the cultural identity of indigenous peoples. Cultural preferences, values and ceremonies are a key reason why indigenous plants and animals continue to be grown and consumed. Agriculture and pastoralism can be highly ritualistic. Box 4 gives some examples of cultural practices and nutritional functions of local and indigenous foods in Uganda.

Box 4. Examples of the use of indigenous foods in cultural practices in Uganda

- Simsim is prepared during marriage ceremonies in Baganda culture.
- Nursing or breast-feeding mothers would be given young pumpkin fruit sliced, cooked, mashed and mixed with vegetable or goat soup, and banana juice among the Baganda communities.
- In Teso sub-region, Northern Uganda, millet porridge prepared with Tamarind juice is given to lactating mothers as it causes high breast milk production. Katunkuma is an important vegetable for the occasion of the birth of twins in some regions in Uganda. It is mainly prepared with matooke and served to the parents of the twins. This practice could be associated with its ability to increase the milk production in the breastfeeding mother, among other benefits.
- For cattle, the social function of dowry payment is highly rated for the Ankole and Zebu cattle, this reflects cultural obligations traditionally practised by the peoples throughout Uganda.
- The Small East African goat is used for dowry payment and gifting in ceremonies in northern Uganda.
- The mature dry fruit or calabash is increasingly becoming popular in marriage ceremonies in the central and western parts of Uganda, where it is used to serve local drinks.

Sources: PELUM Uganda (2011); FAO (2004).

4. DOING MORE TO PROMOTE INDIGENOUS FOODS

Despite the nutritional, resilience and environmental benefits of indigenous foods, their production and consumption are generally declining due to the prestige associated with modern foods, lack of consumer awareness about their health benefits, limited policy framework for promoting them and limited producer awareness of the growing markets for indigenous foods and how to access them. This chapter outlines the opportunities for helping indigenous foods regain a central role in diets, livelihoods and culture.

4.1 The policy context

Although some national policy documents mention promoting the conservation, production, or consumption of indigenous foods, in general this is not very pronounced. However, it provides a small window of opportunity to advocate for the protection and promotion of the indigenous foods and food systems. Whether these components of the policies are being implemented needs further investigation.

The goal of the **2003 Uganda Food and Nutrition Policy** is to ensure food security and adequate nutrition for all the people in Uganda, for health and social and economic well-being. However, there is no mention in the policy of the promotion of indigenous foods and food systems for food and nutrition security improvement, limiting their prioritisation in government resources and actions.

The **National Agriculture Policy (2013)** envisages having a “competitive, profitable and sustainable agricultural sector”. In order to ensure household and national food and nutrition security, the policy mentions its plans to “promote the production of nutritious foods, including indigenous foods to meet household needs and for sale”. In its quest to develop human resources for agricultural development, there are plans to “promote the preservation and utilisation of appropriate indigenous knowledge”. Besides this, the main focus of the policy is on commercialisation of the agricultural sector.

The **2018 National Seed Policy’s** goal is to guide, promote, develop and regulate the seed sub-sector in order to ensure availability and access to safe and high-quality seed to all stakeholders for increased food and nutrition security, household income, wealth creation and export earnings. Priority area 3.1.2 is to “sustainably utilise and protect Uganda’s national plant genetic resources”, and the policy aims to develop a new law to protect and preserve indigenous knowledge of local varieties and effectively protect community intellectual property rights. The government, according to this policy, also intends to “provide for listing of traditional and participatory bred varieties” in order to safeguard the quality of declared seeds. It plans to implement the policy “in tandem with other policies and laws that protect communities’ intellectual property rights over their traditional varieties”. The policy provides greater opportunities to promote the availability of indigenous seeds that provide the basis for indigenous foods and food systems, and to incentivise their maintenance through the protection of farmers’ rights to local varieties and indigenous knowledge.

There is a general understanding among practitioners that the **Plant Varieties Protection Act (2014)** mainly enhances the rights of commercial plant breeders. It does not protect local farmers’ and farming communities’ rights over the traditional seeds they have developed, including the right to register traditional varieties and right to seeds, which is detrimental to indigenous food systems (Herman, 2017).

The **National Extension Strategy of 2016/17-2020/21** has a goal to “Establish and strengthen a sustainable farmer-centred agricultural extension system for increased productivity, household incomes and exports”. However, there is minimal mention of promotion of indigenous knowledge in agricultural extension systems. The focus is on commercialisation of the agricultural sector.



Cassava (Joseph Muhumuza)

The **Uganda Nutrition Action Plan (UNAP) (2011-2016)** aims to reduce malnutrition levels among women of reproductive age, infants and young children. In its second objective, to “Enhance consumption of diverse diets”, the action plan aims to promote production and consumption of indigenous foods to enhance dietary diversification, and to promote positive indigenous dietary practices. The Action Plan also aims to research, document, and disseminate findings on positive indigenous dietary practices in its strategy to enhance operational research on nutrition. It provides key opportunities for the promotion of consumption of nutritious indigenous foods in Uganda.

The vision of the **National Biodiversity Strategy and Action Plan 2 (2015-2025)** is to “Maintain a rich biodiversity benefiting the present and future generations for socio-economic development”. The strategy documents Uganda’s indigenous foods, including wild fruits and vegetables, medicinal plants, indigenous staples like millet and sorghum, and animal breeds, and the threats to

indigenous plant and animal species. It also requires that “by 2020, management plans are in place for areas under agriculture, aquaculture and forestry to ensure sustainable biodiversity conservation”. The strategy provides a strong basis and justification for the need to preserve indigenous species.

Work by Hivos’ partners in Uganda is already underway to help shape the policy environment (Box 5).

4.2 Re-valuing indigenous foods

In Uganda, indigenous foods tend to be stigmatised and attitudes towards them are negative, especially amongst youth and children. Use of indigenous foods, and especially those in the wild, is considered primitive and backward and is associated with low standards of living or poverty. It has also been reported that younger generations dislike vegetables because of the bitter taste, non-attractiveness and palatability (Bua and Onang, 2017). Relatively rich families are said to eat meat and soups. Although negative

Box 5. Promoting fresh policy thinking: food change labs and food parliaments

Kabarole Research and Resource Centre (KRC) works in Kabarole district. One of its activities is to organise a food change lab. A change lab is a safe space for various stakeholders to address complex social challenges through experimentation and innovation. A change lab jointly explores the situation, develops a shared vision of the future, tries out a number of collectively owned solutions in the real world, and uses evidence to further refine them. This creates space for mainstream actors and frontrunners to meet and shape the green and fair food systems of tomorrow. The overall goal of the lab is to contribute to a more conducive policy environment and laws that make the region’s food system more inclusive, sustainable, diverse, healthy, acceptable and green and to ensure that affordable foods are available to all.

Slow Food Uganda is implementing the Food System Solution Platform, a Hivos-funded programme in Buikwe district. It is organising policy dialogues involving food

parliaments where citizens’ voices are harnessed to deliberate on the promotion and improvement of food and nutrition security in the district. Of equal importance in their agenda is the promotion and preservation of indigenous and traditional varieties of crops, plants and animals.

The Food Rights Alliance (FRA) works at the national level with a focus on policy. Their goal is to ensure integrated agricultural sector investment planning for improved nutrition and sustainable diets. Their work aims to integrate nutrition, food and nutrition security within the agriculture investment plan (the Agriculture Sector Strategic Plan or ASSP). They also focus on building the capacity of civil society partners in policy awareness and advocacy and giving support on issues related to food and nutrition, youth, women and gender. This includes support to policy, implementation plans budget analysis, budget tracking and budget advocacy.



Okra seeds (Joseph Muhumuza)

perceptions are more commonly reported among urban consumers than rural consumers (Kansiime et al., 2018), there is a resurgence in awareness of the health benefits of these indigenous foods amongst the upper and middle classes in urban areas, and there is a gradual increase in demand for these foods in urban settings.

Initiatives are needed to change these negative perceptions and increase awareness of the nutritional benefits of indigenous foods that have been produced on-farm or collected from the wild for centuries. Nutrition education and communication are recognised as a primary form of intervention in food and nutrition programmes. The ultimate goal of nutrition education is to produce nutritionally literate decision makers who are motivated, knowledgeable, skilled and willing to choose proper nutrition alternatives. To be effective, nutrition education must communicate clear messages to achieve a specific behaviour-change goal amongst target groups (FAO, 1997).

Nutrition education actions can be categorised into four types (Hawkes, 2013):

- 1) **Public awareness campaigns:** activities include mass media campaigns, public relations events like community talks and food demonstrations, health and nutrition education and training, and social media campaigns.
- 2) **Nutrition education in specific settings:** this can be through schools (curriculum and trainings) and other educational settings, workplace training and community training.
- 3) **Skills training:** through promoting food production skills as a means to encourage healthier diets, cooking skills, food preservation skills, etc.
- 4) **Changes to the food environment:** actions include school meals provision, ensuring healthy foods are available in kiosks in the vicinity of schools, workplace wellness programmes and nutrition labelling.

Programmes that are promoting the production and consumption of indigenous foods need to integrate nutrition education as a core pillar, in order to improve attitudes towards these nutrient-rich and resilient foods.

Hivos' partners have launched several initiatives around the country to raise awareness and promote the status of indigenous foods (Box 6).

Box 6. Raising the profile of indigenous foods in Uganda

VEDCO Uganda (Volunteer Efforts for Development Concerns) works in Gulu district, with a focus on two sub-counties: Badege and Bungatira. The focus of the project is improving access to quality indigenous vegetable seeds and knowledge relevant for sustainable indigenous food production and consumption. They also support two farmer groups to produce indigenous vegetable seeds, as well as training and supporting 21 farming groups in indigenous vegetable production. They work with the local government to integrate indigenous vegetables, for improved nutrition, into district plans and budgets. A key activity is to create awareness of the importance of local vegetables in diets. This is done through local radio programmes, community meetings and local leaders' meetings, and promoting good nutrition so as to influence the food habits of local communities (this is done through 'diet champions').

As part of its work, **KRC** has been engaging with local chefs, through a 'coalition of the willing' in Fort Portal, where some local hotels are now including indigenous foods in their menus and even setting aside a day per week where they prepare indigenous foods only.

5. CONCLUSIONS AND RECOMMENDATIONS

It is evident that Uganda is rich in nutritious indigenous foods. Much more needs to be done to conserve this wealth and to promote the use of indigenous foods across different population groups in urban and rural areas. Given the population's inadequate intake levels of the five vitamins and minerals critical to good health (vitamin A, vitamin B-12, iron, zinc, and calcium), indigenous foods can play a critical role in addressing these nutritional deficiencies.

Limited research, agricultural extension support and political attention is given to indigenous foods – their conservation, production and use. There is also limited awareness of the role that these nutrient-rich foods can play in the health and nutrition outcomes of the population. The potential of indigenous foods to address food and nutrition security, climate change and environmental challenges is largely unexploited due to lack of investment to improve yields and markets and address the negative perceptions of indigenous foods as a poor man's food.

Knowledge and information on the production constraints, processing and value addition of indigenous foods is either lacking or not widely available. Furthermore, all activities to strengthen the indigenous food supply chain in urban and rural areas should aim to actively include disadvantaged groups, including indigenous communities, women and youth.

5.1 Recommendations

Below we highlight key recommendations for promoting and conserving indigenous foods and food systems in Uganda. They are organised into three levels – policy, programme, and community. Action at all levels is vital.

Policy level

There is a need for the government to take a strong leadership role on the indigenous food and food systems agenda, so that funding for such programmes becomes a priority. Priorities span different sectors (agriculture, environment, nutrition, health, land), and include:

- Implementation of policies that promote indigenous foods, indigenous food systems and indigenous knowledge, such as Uganda's National Biodiversity Strategy and Action plan.
- Enhancing promotion and protection of indigenous foods and food systems within other key policies, for example the Food and Nutrition Policy, Agriculture Extension Strategy and Nutrition Action Plan.
- Ensuring that the relevant policies listed above, ie. the 2003 Uganda Food and Nutrition Policy; National Agriculture Policy (2013); 2018 National Seed Policy; Plant Varieties Protection Act (2014); National Extension Strategy of 2016/17-2020/21; The Uganda Nutrition Action Plan (UNAP) (2011-2016); and the National Biodiversity Strategy and Action Plan 2 (2015-2025) protect and promote indigenous food systems, and not only the commercialisation of exotic crops and livestock, and commercialisation and monopoly of seed systems by private seed companies, at the expense of indigenous foods systems.
- Strengthening informal (and formal) indigenous seed systems: a lack of effective indigenous seed systems leads to inconsistent seed supply for indigenous crops and ultimately to food insecurity.
- Increasing policy action and supporting media campaigns to influence food systems and diets and promote local nutritious foods vis-à-vis processed and fast foods.
- Promoting healthy diets (and physical activity) in view of the rising health sector burden, and promoting preventive care, to improve national productivity and as a basic human right.
- Investing in participatory research and development of indigenous foods, including participatory breeding, as this is a vital weapon in the continuing battle against poverty and hunger alleviation in the country and for the reversal of agrobiodiversity loss.
- Increasing awareness of agricultural extension workers about indigenous foods, as they seem to discourage farmers from nurturing indigenous foods (especially vegetables). This may be due to the government's agricultural commercialisation agenda.
- Investing in indigenous food processing businesses and improving marketing infrastructure for indigenous foods, affordable financial and business services and market information systems.



Traditional food is prepared, kept safe, served hot or warm in pots and baskets (Joseph Muhumuza)

- Reviewing land policies and strengthening land rights for indigenous producers, as agricultural land fragmentation is affecting farming systems (both indigenous and modern).

Programme implementation level

- Increase budget allocations to programmes for promoting indigenous crops/foods (the current focus is heavily on promoting modern agro-export crops).
- Strengthen an association of organisations that can work with government to promote indigenous foods across the value chain; and support and strengthen multi-actor platforms to promote indigenous foods, especially at local level (eg. Food Change Labs and Food Parliaments; see Box 5).
- Strengthen the role of the private sector, including microenterprises and SMEs in key areas of indigenous food systems.
- Invest in youth capacity and tap into their innovation skills to improve production, value addition and marketing of indigenous foods.
- Invest in nutrient analysis of indigenous foods in Uganda and use the evidence to create awareness, prioritising indigenous foods that are only found in Uganda, as this data cannot be borrowed from elsewhere. Add this information to INFOODS (an international database on the nutritional value of foods).
- Integrate indigenous food systems into nutrition promotion programmes, school food programmes, school gardens and education programmes.
- Invest in indigenous knowledge management, farmer-to-farmer dissemination and inter-generational transmission, as such knowledge is rapidly being lost and is not well documented.

- Build community capacities in local food processing and preservation of indigenous foods.
- Promote ‘business oriented’ support to communities and market linkages for indigenous foods, to increase farmers’ incomes, reduce dependence on humanitarian support and enable communities to preserve their indigenous food systems.

Community level

- Encourage and support community efforts to protect and revitalise indigenous foods, food systems and local biodiversity.
- Promote and integrate indigenous foods into farming systems so that they are adequately used and conserved, and improve market access for indigenous food producers.
- Support communities to play a key role in sensitisation of youth on the value of indigenous foods and why they need to consume more of them.
- Increase the voice and role of women, youth and elders in indigenous food systems promotion. They have the potential to rejuvenate these food systems.
- Promote indigenous and local methods of food production, processing and preservation, encourage their continuation by communities, and identify ways to improve them.
- Enhance recognition of the importance of indigenous peoples’ traditional cultures, foodways and knowledge systems in which indigenous foods and food systems are embedded, and the capacity of indigenous peoples to defend their land and resource rights.

There is a need to ensure that the recommendations are implemented at all the three levels in order to have an impact and improve production and use of indigenous foods for enhanced food and nutrition security in Uganda.

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ANNEX 1. OTHER PROGRAMMES AND CASE STUDIES PROMOTING INDIGENOUS FOODS

- **PELUM Uganda.** The Participatory Ecological Land Use Management (PELUM) Association is a regional network of over 250 civil society organisations in 12 countries in East, Central and Southern Africa working in the area of participatory ecological land use management. Their mission is to enhance the effectiveness of members in promoting ecological land use management among farming communities through capacity building, research and innovation, networking and advocacy. PELUM Uganda has been on the forefront advocating for protection and promotion of indigenous foods among smallholder farmers and their households. An Indigenous Food Fair is one of the innovative approaches that PELUM has initiated to increase recognition and awareness of indigenous foods nationally. Some of its case studies include:
 - CARITAS Kampala: Promoting household level seed banking for indigenous seeds in three sub-counties: Sisa (Nakawuka), Nansana (Nansana village) and Katabi sub-county (Mpala village)
 - CARITAS Kabale: Group seed saving and seed multiplication- Supported Kintokoori Tweekore group in Kabale Town to save a portion of their individual seed in one group member's store for next season planting.
 - Environmental Alert and Community Integrated Development Initiatives Promoting seed security through Farmer Field Schools approach in Moyo and Yumbe districts
 - Organization for Rural Development: Indigenous maize seed multiplication and saving in Bugiri district.
- Agency for Integrated Rural Development (AFIRD): Indigenous yams multiplication in Central Uganda
- **Bioversity International – Uganda:** The CGIAR organisation is undertaking its research efforts in joint partnership with the National Agricultural Research Organization (NARO). The organisation's work – carried out over many years in Uganda with partners – has gone a long way towards filling the gaps in characterising and mapping the rich agrobiodiversity in Uganda. Other research areas are on how using diverse, resilient, varieties can help farmers adapt to climate change.
- **National Association of Professional Environmentalists (NAPE):** In July 2016, NAPE together with its partner the Gaia Foundation (UK), launched the project: Strengthening Community Cultural Governance Systems to Protect and Defend Community Food, Land and Natural Heritage Rights in Hoima and Buliisa Districts. The project was supported by the European Union. Its objective was to address the challenges faced by the affected communities, strengthen their capacity to revive their cultural governance systems to protect their land, food and cultural heritage and reduce the impact of conflict. The farmer groups have established gardens for planting indigenous seeds, which are multiplied and shared with others in the community. They assert that indigenous seed are resilient to pests and harsh weather conditions and even last long in the gardens, giving the communities food security as opposed to the improved varieties, which mature faster and rot when left long in the gardens.

- **Environmental Alert (Uganda):** Since 1998, the organisation has evolved from addressing needs orientation to contributing to an enabling natural resources policy and practice environment, with increased and active participation and self-representation of poor and vulnerable natural resources-poor men, women and youth. Within the context of its vision, ‘Communities free of hunger and managing their natural resources sustainably,’ work is driven by its conviction of the intrinsic link between poverty and environment. It has worked over the years to ensure a healthy and sustained environment and natural resources (ENRs) and the realisation of food and nutrition security among its constituents.
- **Learning institutions: Makerere University, Kyambogo University and Uganda Christian University:** these universities are contributing to the promotion of indigenous foods through their research programmes and by supporting students to undertake research in this area, as well as disseminating knowledge.

ANNEX 2. EXAMPLES OF INDIGENOUS AND TRADITIONAL FOODS IN UGANDA

Adapted from PELUM Uganda (2011). *Indigenous foods in Uganda*.

Botanical name	English name	Known local names	Location mostly found	Parts eaten	Uses
ROOTS AND TUBERS					
<i>Dioscorea minutiflora</i>	Yam	Ateso: Abatot Kuku: Mangaa Lugisu (Central): Tsimbama, Imbama Lugisu (North): Tsimpama Luganda: Kaama Lugwe: Embama; Empama Rukiga: Ebihama Runyankore: Ekihama	Many parts of Uganda	Tuber	Food
<i>Dioscorea bulbifera</i> <i>var. anthropophorum</i>	Potato Yam, Aerial yam, Air potato, Bulbil yam, Turkey liver yam, Top yam	Adhola: Puma Ateso: Abatot; Abatut Langi: Ayagogo; Ogogo Luganda: Makobe Lugisu (Central): Kamangugunyu Lugwe: Esoma Lugwere: Isoma Ngakarimojong: Amulijokoit	Central, Eastern and Western parts of the country	Tuber	Food and commercial purposes
<i>Plectranthus esculentus</i>	Livingstone potato	Luganda: Enumbu Rutoro: Ennumbu	Western and Eastern parts of Uganda	Tuber	Edible, nutritional, medicinal
<i>Dioscorea cayanensis</i>	Yellow Guinea yam	Luganda: Balugu (Kyetutumula) Rutoro: Mbalungu	Central and Eastern parts of Uganda	Tuber	Food, the tuber can be stored up to 6 months without refrigeration which makes it a very important food crop for food security

Botanical name	English name	Known local names	Location mostly found	Parts eaten	Uses
<i>Dioscorea alata</i>	Water Yamor purple yam	Luganda: Ebisebe Lugisu: Masebe	Eastern and Western parts of Uganda	Tuber	Edible tuber, nutritive value and medicine
<i>Dioscorea alata</i>	Yam	Luganda: Endaggu	Central Uganda	Tuber	Food
<i>Dioscorea odoratissima</i>		Lugisu: Kamatilibwe Lusoga (Kilamogi): Hama	West Nile, Central parts of Uganda and very common on Ssesse Islands	Tuber	Food
<i>Colocasia esculenta</i>	Cocoyam or Taro	Luganda: Mayuuni (Bwayise) Ateso: Eitipa Lugisu: Bikiyu	Central, Eastern and Western Uganda	Tuber and leaves	Food and sauce
<i>Xanthosoma sagittifolium</i>	Elephant ear or Tania	Luganda: 'Bukopa' Lugisu: Bitolotolo	Central, Eastern and Western Uganda	Tuber and leaves	Food and sauce
<i>Dioscorea quartiniana</i>		Luganda: Ndiga Lugwe: Amachamalah Madi: Kinjo	Most parts of Uganda	Tuber	Food
<i>Mahihot esculenta</i>	Cassava	Luganda: Muwogo Rutoro: Emiwogo; Ateso Emwogo	Most parts of Uganda	Tuber	Food and sauce
<i>Impomeas batatas</i>	Sweet potatoes	Luganda: Lumonde omuganda Rutoro: Ebitakuli Ateso: Acok	Most parts of Uganda	Tuber	Food
<i>Oxalis latifolia</i>		Luganda: Kanyeebwa Ngakarimojong: Emugereng Rukiga: Omwonyo gw'embuzi Runyankore: Kajambura Runyoro: Kanyeebwa	Most parts of Uganda	Leaves	Food: the acidic tasting leaves are chewed fresh by children
PULSES & LEGUMES					
<i>Phaseolus vulgaris</i>	Climbing beans	Luganda: Ebijanjaalo (Mutikke) Ateso: Emaroge Madi: Basolia	Most parts of Uganda	Seeds, leaves	Sauce
<i>Voandzela subterranean</i>	Bambara nuts	Ateso: Isuk	Eastern parts, West Nile region	Seeds	Food
<i>Arachis hypogaea</i>	Groundnuts	Luganda: Ebinyeebwa Ateso: Emaido (Etirait, Egoromoit, ongwara)	Most parts of Uganda	Seeds	Sauce

Botanical name	English name	Known local names	Location mostly found	Parts eaten	Uses
<i>Vigna unguiculata</i> (syn. <i>V. baoulensis</i>)	Wild Cow pea	Adhola: Boojwoge Ateso (Tororo): Akoro bong Luganda: Empindi, Kiyindiru Lugbara: Adroso, Osubi Lugisu (North): Likote Lugisu (South, Central): Libose Ateso: Imare (Local varieties: Ecirikukwai, Ekwogol) Madi: Kolobo osubi, kolobo osu Ngakarimojong: Amaret Runyankore: Omugobe ishwa Runyoro: Mugobiswa	Most parts of Uganda	Leaves, seeds	Food
<i>Sesame indicum</i>	Wild sim sim	Ateso: Eballo	Swampy areas in Uganda	seed	Snack
<i>Cajanus cajan</i>	Pigeon peas	Luganda: Enkolimbo Ateso: Epena Luo: Lapena	Northern Uganda	Seed	Seeds eaten as sauce
<i>Phaesolus lunata</i>	Lima beans	Acholi: Abangbang Langi: Chuku Luganda: Obuyindiyindi Lusoga: Buyindiyindi Lugbara: Alututika Rutoro: Amajalero Runyoro: Amajalero Runyankore: Obuhindhindi	Many parts of Uganda	Seeds, leaves	Food (as sauce), medicine
CEREALS					
<i>Eleusine coracana</i>	Millet	Luganda: Obulo Ateso: Akima (Local varieties include Eitiyo, Ekapakapa, Eidiera, Emoru)	Many parts of Uganda	Seeds	Food (maily porridge)
<i>Sorghum bicolor</i>	Sorghum	Luganda: Omuwemba omweru; Ateso Imumwa (Ilodir, Elemunyang, Eiterema)	Many parts of Uganda	Seeds	Food (maily porridge)
<i>Zea mays</i>	Maize (some indigenous varieties)	Luganda: Kasooli Lugisu: Nabukubo, Kamaindi, Kasoli Ateso: Ekirididi	Many parts of Uganda	Grain/Seeds	Food
VEGETABLES					
<i>Amaranthus dubius</i>	<i>Amaranth Spinach</i>	Luganda: Doodo Rutoro: Doodo Ateso: Eboga Madi: Enze	Found in all regions in Uganda	Leaves	Vegetable, Medicinal, leaves are squeezed and the liquid used to treat wounds.
<i>Amaranthus lividus</i>	<i>Amaranthus spinach</i>	Luganda: Ebbugga Runyankore: Doodo Rukiga: Omuriri Rutoro: Doodo Madi: Enje	Found mainly in Central and Western Uganda	Leaves	Vegetable, Medicinal, some species are burnt to produce ash used for cooking

Botanical name	English name	Known local names	Location mostly found	Parts eaten	Uses
<i>Amaranthus graecizen</i>	Amaranthus spinach	Luganda: Ebugga Runyankore: Doodo Rukiga: Omuriri Rutoro: Doodo Madi: Enje	Found mainly in Central and Western Uganda	Leaves	Vegetable, Medicinal, some species are burnt to produce ash used for cooking
<i>Amaranthus spinosu</i>	Thorny <i>Amaranth</i>	Luganda: Doodo Rutoro: Bwahrwa itaka Ateso: Akwacho Madi: Enze	Found in drier parts of the country especially Eastern and Northern Uganda	Leaves and seeds	Rarely prepared for sauce since it is thorny. In Teso region it is burnt to produce ash used for cooking
<i>Vigna unguiculata</i>	Cowpea leaves	Luganda: Eggobe Rutoro: Omugombe Ateso: Eboo Luo: Bojo Madi: Kolobo isu	Traditionally grown widely in Eastern and Northern regions. In Central grown for commercial purposes	Leaves	Sauce
<i>Gleome gynandra or Gynandropsis gynandra</i>	African Spider plant	Luganda: Ejjobyo Rutoro: Eyobyo Ateso: Ecadoi Madi: Jiri	Grows all over the country except in very dry places	Leaves	Sauce, medicinal
<i>Solanum aethiopicum</i>		Luganda: <i>Nakatti</i> Rutoro: Obugorra	It can grow all over Uganda but is cultivated mainly in Central Uganda	Leaves	Eaten as a side dish
<i>Solanum gilo</i>	African eggplant	Luganda: Entula Rutoro: Enjagi	Mainly in Central and Western Uganda	Berries/fruit	Berries/fruit
<i>Solanum nigrum</i>	Black night shade	Luganda: Ensugga Lugisu: Essufa; Enswiiga	Mainly in Central and Western Uganda	Leaves, shoot and berries	Sauce and medicinal
<i>Solanum anguivi</i>	Bitter berries	Luganda: Kantukuma; Obujabara	Found in all regions in Uganda although varieties may vary	Fruit	Sauce
<i>Lycoperscon esculentum</i>	Local cherry tomatoes	Luganda: Bulaya Rutoro: Katembameza Ateso: Inyanya yenidid	Grows all over the country	Fruit	Salad or sauce
<i>Curcubita maxima</i>	Pumpkin	Luganda: Essunsa (leaves), Ensujju (fruit) Ateso: Asuswa (leaves), Asujjo (fruit)	Grows all over the country	Leaves, fruit and seeds	Leaves are eaten as a vegetable before maturity and mature fruit is eaten as a main carbohydrate food
<i>Colocasia ensculeanta</i>	Cocoyam leaves	Luganda: Ettimpa	Found in all regions but grown and eaten mainly in Central Uganda	Leaves and roots	Eaten as a vegetable, mainly mixed with groundnut sauce

Botanical name	English name	Known local names	Location mostly found	Parts eaten	Uses
<i>Sechium edule</i>	Cho-cho	Luganda: Ensusuuti	Mainly Central Uganda	Fruit	Used mainly as a vegetable
<i>Hibiscus sabdariffa</i>	Prickly tree hibiscus	Runyoro/ Rutoro: Ekikenke Ateso: Emalakany Luo: Malakwang Lugbara: Kelebi	Mainly in Northern and North Eastern Uganda but grown also in Central region for sale in urban markets	Leaves and flowers	As a sauce
<i>Oxygonum sinuatum</i>		Luganda: Kafumita bagenge Rutoro: Kacumita bagenge Ateso: Adalarac/Akit emir Madi: Aragaku	Found in all regions in Uganda but eaten mainly in Teso region	Leaves	As a sauce
<i>Asystasia mysorensis</i> (synonym <i>A. schimperi</i>)		Luganda: Ttemba Ateso: Ecototo/Akeju kakiteng Madi: Mutua Lugbara: Kabilokumit	Teso region	Leaves	Used as a sauce in Teso region. In Buganda it is used as a medicine given to people to restore appetite for meat for those who have lost it.
<i>Corchorus trilocularis</i>		Acholi: Otigo lum Langi: Otigo Rutoro: Eteke Ateso: Alilot	Found in all regions in the country but eaten mostly in West Nile, Northern and Eastern Uganda.	Leaves	Sauce mixed with other vegetables.
<i>Corchorus olitorius</i>	Jute	Luganda: Mutere Rutoro: Eteke Ateso: Atigo Acholi: Otigo winyo Lugbara: Atiriko lobi	West Nile, Northern, Eastern and parts of Central Uganda	Leaves	Sauce, medicine
<i>Cyphostema denocaele</i>		Luganda: Kabombo Ateso: Emoros Madi: Eture	Found in all regions in the country	Leaves	Sauce but also commonly used as animal feed especially for pigs
<i>Ipomea eriocarpa</i>		Ateso: Ecodokoko	Teso region	Leaves	Vegetable
<i>Curcumis melo</i>	Local cucumber	Ateso: Akobokob/Akolil	Teso region	Fruit	As a salad and as a sauce when dried
<i>Balanites aegyptica</i>	Desert date leaves	Ateso: Ecomai	Semi-arid regions like North Teso and Karamoja region	Tender leaves	Sauce
<i>Fleurya ovalifolia</i>	Stinging nettle	Rutoro: Oburara Ateso: ekenepe	Found in commonly in Central and Western Uganda	Leaves	Leaves as sauce and as herbal tea with medicinal properties
<i>Basella alba</i>	Vine spinach	Luganda: Nderema Rutoro: Enderema	Found commonly in Western and Central Uganda	Leaves and seeds	Sauce and medicinal (treats sore throat)

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FRUITS					
<i>Aframomum anguistifolia</i>		Acholi: Ochayo Langi: Kongo amor Lugishu (central): Kamangwali Luganda: Matungulu Rutoro: Amatehe Runyoro: Amatehe Runyankore: Amatehe	Found in the moist areas in Eastern, Central and Western parts of Uganda	Fruit	Snack and food: the ripe fruit is collected and the sugary pulp eaten as a snack. It is enjoyed by children. Medicinal: the seeds are crushed, dried and then mixed with water as an emetic in cases of poisoning as it makes one vomit. It is commercially sold.
<i>Aframomum alboviolaceum</i>		Acholi: Ochayo Alur: Ocayi Luganda: Ttungulu, Ateso: Acawoi; Madi: Itiviri/ Ituriri Runyakore: Amatehe Runyoro: Amasaasi, Amasasa	Found in Central, Eastern, Northern, West Nile and Western Uganda	Fruit	Food and Medicinal: the fruit which appears above the soil surface but is part of the underground rhizome, is harvested
<i>Vangueria apiculata</i>		Lugisu: Shikomosi, Kidangerere Luganda: Matunguda Rutoro: Amatunguda Ateso: Emalere Ngakarimjong: Emaler Rukonjo: Kasogo Runyoro: Matugunda Runyankore: Kitungunda	It is widespread in secondary scrub, open forest and cultivated areas in Central, Western and the Eastern parts of Uganda.	Fruit	Food: ripe brown fruits are collected from the tree and eaten fresh and the seeds rejected. They taste sweet and are eaten in small amount as a snack. It is normally eaten by herdsmen and children.
<i>Psidium guajava</i>	Guava	Luganda: Amapeera Ateso: Emapeera	Central, Western, Northern and the Eastern parts of Uganda	Fruit	Food and snack
<i>Garcinia buchananii</i> (syn <i>G. huillensis</i>)		Luganda: Musaali (Plant) Ensaali (Fruit) Lugisu: Kikameri, Mubidira, Rutoro: Ensali Runyoro: Museka, Nseka (fruit)	Central Uganda	Fruit and seed	Food and snack. When ripe, fruits are peeled and the pulp eaten
<i>Canarium schweinfurthii</i>	Incense tree	Luganda: Muwafu Runyoro: Empafu Lusoga: Muwhafu	Central Uganda, around Lake Victoria	Fruit and seed	Food and snack: the ripe fruits are harvested and immersed in hot water to soften the rind (outer skin) and flesh and then eaten. Fruits can be collected, de-pulped, cracked and inner part of the seed eaten. Medicinal: The leaves are boiled and mixed with other herbs to treat cough. The bark is used to treat hypertension.

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<i>Carissa edulis</i>	Carandas plum	Acholi: Acuga, Acoga Adhola: Ocuga Alur: Acoga Ateso: Ekamuriai Luganda: Muyonza Lugisu: Butununu, Gamalwa Rutoro: Amayonza Runyankore: Enyonza, Omuyonza Madi: Uba	Most parts of Uganda	Fruit	Food and snack: The fruits are picked while ripe (black or purple) and the pulp eaten. Small amounts are eaten occasionally as snacks. The roots are crushed and added to tea for flavour. Medicinal: the roots are used for treating headache, the leaves for cough and the roots malaria.
<i>Rhus vulgaris</i>		Acholi: Awaca Adhola: Awaya Alur: Abegwinyo, Atyendwinyo Ateso: Epwatet, Ewaya Luganda: Kakwansokwanso Lugisu: Nabiiti Runyankore: Obukaanja Runyoro: Obukanjakanja	Central, Western, Eastern regions of Uganda though it is found in many other parts of the country.	Fruit	Food: the tiny fruits are picked ripe and unripe and eaten. The fruits are boiled and the liquid extracted and added to porridge
<i>Rubus pinnatus</i> var. <i>afrotropicus</i>	Raspberry	Luganda: Nkenene Lutoro: Amakerere Lugishu (central): Luwambi Rukiga: Encerere Rutoro: Amakere Runyankore: Encerere Runyoro: Amakerere	Central, Western, Eastern and West Nile region. It generally grows in many regions of Uganda.	Fruit	Food: The orange-red composite fruits (berries) that taste sweet are collected when ripe when and eaten immediately as a snack. They are eaten occasionally in moderate amounts. Also sold in major markets in Mpigi
<i>Physalis peruviana</i>	Cape goose berry	Acholi: Kongo ogwal Alur: Thamungwal Ateso: Aiduduma, Etaagoli lo apolon Luganda: Ntuuntunu Langi: Kongo ogwal ogwal Rutoro: Ntuutu Runyakore: Entuutu Runyoro: Ntuutu	Central, Western but common in most parts of Uganda	Fruit	Food and snack: fruits are collected when ripe and yellow and eaten fresh as a snack especially for children. The fruit juice can be added to porridge.
<i>Punica granatum</i>	Pomegranate	Luganda: Enkomamawanga	Central Uganda	Fruit	Food and snack
<i>Artocarpus heterophyllus</i>	Jack fruit	Luganda: Ekifennesi Ateso: Effeny	Central, Eastern, Western Uganda	Fruit	Fruit and snack
<i>Annona muricata</i>	Sour sop	Luganda: Ekitafeeri Lutoro: Omustaferi	Central, Western	Fruit	Fruit and snack

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<i>Annona senegalensis</i> (syn. <i>A. chrysophylla</i>)		Acholi: Obolo, Obwolo Alur: Obwolo Ateso: Ebwolo, Ebola Madi: Nvolo Langi: Obwolo Lugbara: Lipa, Elepo	Northern parts of Uganda and in West Nile	Fruit	Food, Snack: The ripe fruit is harvested from the tree and eaten immediately after removing the hard coat. The green mature fruit can be picked and stored to ripen. It tastes sweet with a pleasant pineapple-like odor; eaten by children as a snack in moderate amounts. Medicinal: The bark and the roots are crushed together and applied to snake bites. The gummy inner bark is used to cover wounds to stop bleeding. It has commercial purposes in some local markets.
<i>Passiflora edulis</i>	Passion fruits	Luganda: Butunda Rutoro: Amatunda	Central, Western, West Nile	Fruit	Food, Snack, juice
<i>Tamarindus indica</i>	Tamarind	Acholi: Cwa Adhola: Chwaa Alur: Chwa Langi: Cwao Luganda: Mukooge Rutoro: Nondwa Ateso: Epeduru Madi: Iti; Lugisu; Kumuhuwa Runyoro: Mukoge Lusoga: Mokoge	Northern Uganda and Karamoja	Fruit and leaves	Food (pulp for drink, fruit, spice), medicine (bark, leaves, roots, fruit): The fruits can be picked from the tree and eaten fresh or the fallen fruits are collected, cleaned and soaked in water and mixed with porridge and also used in preparation of Ugali (maize bread). The leaves are added to cooking beans or peas. Sim sim and ground nuts can be added to make the sauce thicker. The young leaves can be boiled and the liquid used in preparation of Ugali. Beverage: The ripe fruit is soaked in water and left to ferment for 2-5 days to produce a sweet smelling and tasty alcoholic beverage.
<i>Trecuria africana</i>	African breadfruit, wild jack fruit	Luganda: Muzinda	Western and Central Uganda near streams or swampy areas of the forest.	Seed	Food (Edible seed). The fruit is collected, the seeds are removed and the slime is washed off. The seeds are then roasted in a pan and eaten with or without removing the outer coat. It is eaten as a snack

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<i>Vitellaria paradox</i>	Shea-butter tree	Acholi: Yaa Alur: Yao Ateso: Ekunguru, Eduu (fruit) Madi: Awadu/Awa Langi: Yao Lugbara: Komoro Ngakarimojong: Ekungurit	West Nile, North Eastern, and Northern parts of Uganda with less than 1000mm of annual rainfall	Fruit, seed	Food (seed), oil (cooking, soap, candles): The orange fruits are collected from the ground and the fleshy part eaten as a snack. The seeds are dried, crushed, boiled in water and the liquid is allowed to cool and oil skimmed off. This is used in preparation of beans, peas and vegetables. The seeds are also roasted and grated to form shea butter. To extract the oil, the shea butter is boiled with water, allowed to cool, and the oil is skimmed off.
<i>Balanites aegyptica</i>	Desert date (tree) Desert date (dried fruit), Egyptian Myrobalan (unripe fruit)	Acholi: Logwat; Too, To Alur: Thoo Luganda: Liggwalimu, Musongole Ateso: Ekorete, Ecomai/ Ebwolo (fruit) Madi: Logba Rutoro: Rukoyo Lugisu: Zomali	West Nile, North, North Eastern, low areas of Arua district, and near Kasese, in the rift valley (Butiaba ats) and in other drier parts of the country.	Fruit, leaves	Food (Fruit and leaves), oil (fruit), medicine (roots, bark, fruit): The fallen fruits are collected and the pulp eaten fresh. Cooking oil is extracted from the seed by roasting, pounding and boiling in water. After cooling, the oil is skimmed off. It is eaten with sweet potatoes or cassava. The leaves are collected, mashed and added to boiled beans or peas. They can also be served alone. Simsim, groundnuts or cucumber -seed paste is added. Medicine: the decoction of the roasted and pounded seeds in water is used to treat diarrhea
<i>Vitex doniana</i>	Black plum	Acholi: Oywelo Adhola: Yuelo Luganda: Munyamazi Runyoro: Muhomozi Lugisu: Shifudu Langi: Owelo Ateso: Ekarukei Madi: Ledo/ Ledu Ngakarimojong: Ekarukoi	Central, Western, Eastern, West Nile regions of Uganda.	Fruit	Food (Fruit), medicine (bark, leaves, roots, fruit) and fodder for animals (leaves, fruit) Medicinal: the leaves are used to treat anaemia and the root decoction to treat sexually transmitted diseases
<i>Diospyros mespiliformis</i>	African ebony	Ateso: Ekum Lugbara: Kumi Ngakarimojong: Ekolitak	North Western, Northern and the North Eastern regions, often on termite mounds	Fruit and seed	Food (fruit: dry, fresh, fermented drink) and medicine (Bark, roots, fruit)

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<i>Borassus aethiopicum</i>	Borassus Palm, African fan palm	Acholi: Tugo, Tugu Luganda: Katuugo, Kituugo Lugbara: Itu, Utu Runyoro: Ekituugo Runyankore: Ekikindu Ateso: Edukudukut, Eduku, Edukut, Nyadokanet Madi: Itu	Central, Eastern and West Nile regions of Uganda. However, it is mainly found in the food plains along Semliki and Kafu rivers, in Palabek county of Kitgum District and in Murchison Falls National Park.	Fruit	Food (Fruit, seeds, young seedlings, palm wine (sap of flower shoots), medicine (roots, flowers, oil), oil (fruit, pulp)
<i>Ximenia americana</i>	Sour plum, Wild plum	Acholi: Olelemo Adhola: Olimu, Ombewo Alur: Olemu Luganda: Museka Ateso: Ailama (fruit) Langi: Olimo Runyoro: Enseka Madi: Icu, Itzo, Ichu	Mostly in dry land areas, it grows in dry scrub or bush associated with <i>Acacia hockii</i> and around termite mounds. It is found in West Nile, Central, North Eastern (Karamoja) and in the scrub of Lake Mbuoro National Park	Fruit which is red	Food: the ripe orange to red fruit is sweet. The edible part is the pulp and is eaten fresh; sometimes, it is eaten as a snack by herdsmen and children. The juice is used as a flavour to porridge and oil is extracted from the seed by the Karimojong.
<i>Parinari curatellifolia</i>		Kakwa: Andzili Luganda: Munazi, Mubula Madi: Andzili/ Angili Lugbara: Angili, Ang giligo Rutoro: mubura	Western shores of Lake Victoria, West Nile, Karamoja, Northern and Western regions	Fruit and seed	Food: the part eaten is the flesh of the woody fruit. Medicinal: the oil is used as a liniment to be rubbed on dislocated joints to speed up healing. It is also used as skin ointment and as a hair oil to treat dandruff and lice infestation.
<i>Cyphomandra betacae</i>	Tree Tomato	Luganda: Ekinyanya Rutooro: Ekidodoima Runyankore: Ebitonganwa	Central, Western and Southern Uganda	Fruit	Food: it is eaten as fruit or a snack and like tomatoes as a sauce; it also be prepared as a juice.
<i>Ziziphus abyssinica</i>		Langi: Madi: Liria Lusoga: Namukodolwa.	North Eastern Uganda	Fruit	Food: eaten as a fruit, mainly eaten by children and herdsmen

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