Uganda: Food Security and Ecosystem Resilience

Introduction

The Ministry of Agriculture, Animal Industry and Fisheries has the mandate for food security in Uganda. Specifically, it aims to address the challenges of food security by increasing production and commercializing agriculture to support income generation and adequate food and nutrition supply. Poverty, hunger and under nutrition are key problems in the country. Some of these issues are already integrated into the National Development Plan which has also integrated elements of the SDGs.

Table 1: Key indicators (World Bank, 2017) (UNDESA, 2018)

UGANDA	2018
Total population (million)	44.27
Total area (km^2)	241,550
Population density (persons/km^2)	221.6
Per capita income, 2015 (US $)	700

Relevant SDG 2 indicators

2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)

2.4.1 Proportion of agricultural area under productive and sustainable agriculture

Agriculture in the Ugandan Economy

Uganda's land area is 241,550 km^2 and 72 per cent of it is classified as agricultural land. The potential to address the issues of food security are thus immense. The population in 2018 was 44 million; it has been growing at a constant rate of 3.4 per cent since 2005. About 77 per cent live in the rural areas (UNDESA, 2018) (World Bank, 2017).

The contribution of agriculture to the economy in 2018 was 25.5 per cent with 68.1 per cent of the population employed in agriculture. This has been slowly declining from 75 per cent in 2005 (UNDESA, 2018). See Table 1 and Figure 1.

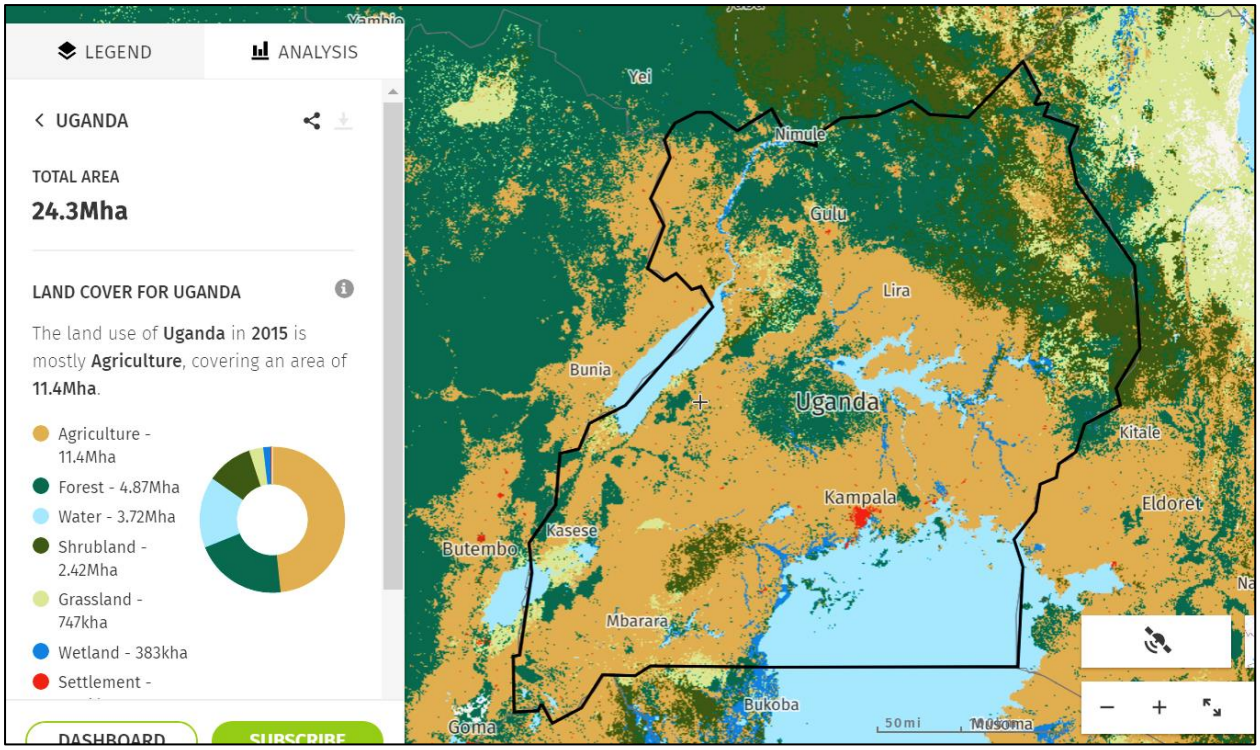

Figure 1: Uganda's land cover (2015). Data source: Global Forest Watch

Food Security Situation

Despite the good climate and abundant arable land, food insecurity is an issue in Uganda. This is partly due to localized shortfalls in harvests and influx of refugees. For instance, poor harvests in 2018 led to about 500,000 people in northeastern Karamoja and eastern Teso being severely food insecure (FAO, 2019a). Food insecurity contributes to undernutrition and children who are undernourished are at a higher risk of mortality, poor health, growth and development. Indeed, the number of undernourished people in 2016 was 17.2 million people or 41.4 per cent of the population. Table 2 highlights the food security situation in greater detail and Figure 2 shows the livelihood zones (UN Stats, 2019).

Table 2: Food insecurity trends in Uganda (FAO, IFAD, UNICEF, WFP and WHO, 2018)

Location	Prevalence of undernourishment in the total population (%)		Prevalence of severe food insecurity in the total population (2015-2017)	Prevalence of wasting in children under 5 (2017)	Prevalence of stunting in children less than 5 years of age (%)		Prevalence of overweight in children under 5 years of age (%)	
	2004-2006	2015-2017	%	%	2012	2017	2012	2017
Uganda	24.1	41.4	-	3.6	34.2	28.9	5.8	3.8
Eastern Africa	34.4	31.2	29.2	6.0	38.5	35.6	4.5	4.4
Africa	21.3	19.6	25.9	7.1	32.6	30.3	5.0	5.0

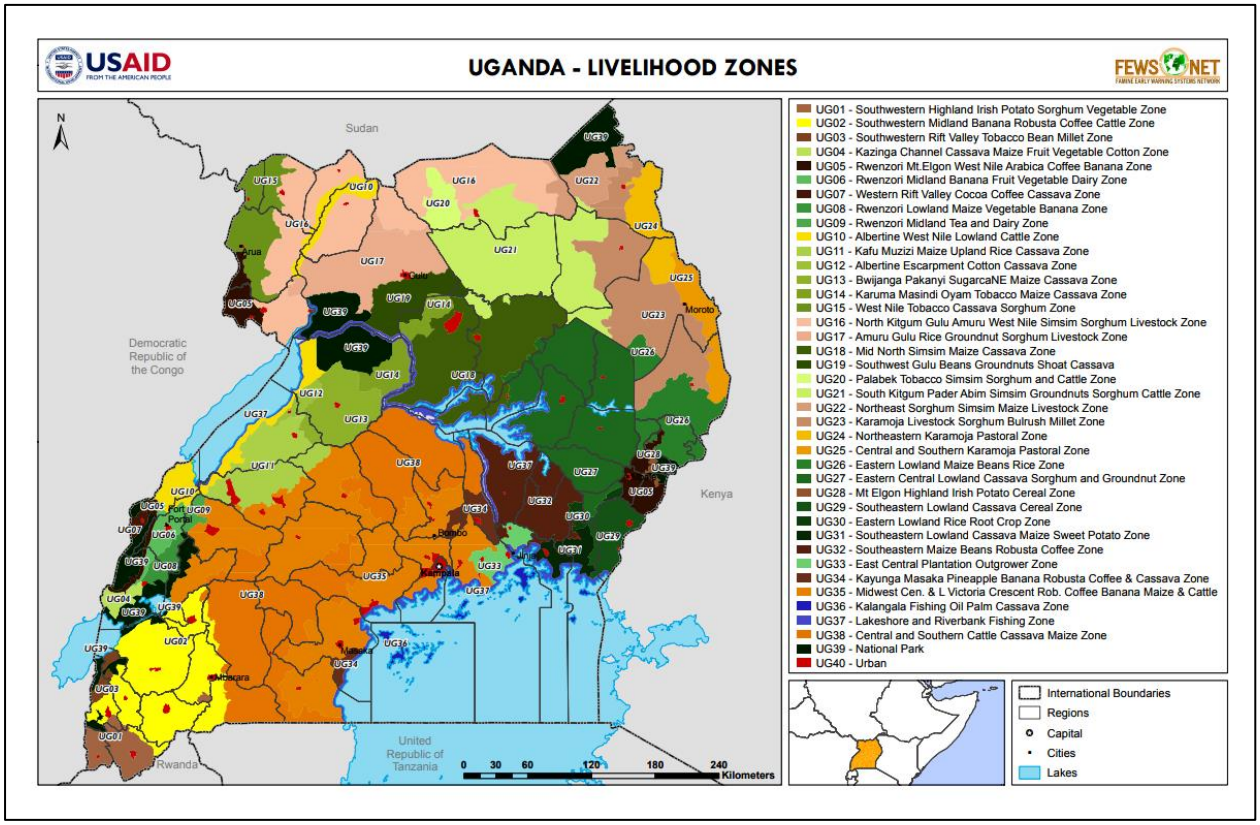

Figure 2: Uganda livelihood zone fews.net

Ending Hunger

Relevant SDG 2 indicators

2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities

2.5.2 Proportion of local breeds classified as being at risk, not at risk or at unknown level of risk of extinction

Genetic Diversity

Some of the threats to agricultural biodiversity include introduction of new breeds, breed substitution and genetic transformation, deforestation, habitat destruction caused by settlement, industry and agricultural encroachment, over exploitation of natural resource such as fish, alien species and pollution (NEMA, 2016). While there may be an argument for the replacement of local crop varieties by introduced commercial varieties, genetic, species and ecosystem diversity are key ingredients upon which food production largely depends. Therefore, the loss of indigenous and wild species found in cultivated and other areas are a major threat.

By 2018, there were 27 local breeds kept in the country. The number of plant breeds with sufficiently stored genetic resources in 2017 was 5,027, a 45 per cent increase from 3,456 in 2010 (UN Stats, 2019). The number of local breeds at an unknown level of extinction was 13 in 2018 increasing from 6 in 2000. All local breeds (100 per cent) are thought to be at an unknown level of risk of extinction (UN Stats, 2019).

Renewable Energy

Relevant SDG 7 indicators
7.2.1 Renewable energy share in the total final energy consumption

The proportion of renewable energy share as a share of total final energy consumption was 88.59 in 2016 having declined from 94.32 in 2002 (Figure 3). The proportion of people with access to electricity in urban areas 57 per cent and 11.43 per cent in rural areas in 2017 (UN Stats, 2019). Renewable energy in Uganda includes hydro, solar, geothermal, wind, biomass and peat energy among others. The Renewable Energy Department of the Ministry of Energy and Mineral Development is the institution in charge of driving the renewable energy agenda in Uganda. The legal framework includes the National Energy Policy 2002 and the Renewable Energy Policy 2007 which had a goal to increase the use of modern renewable energy to 61 per cent of the total energy consumption by 2017.

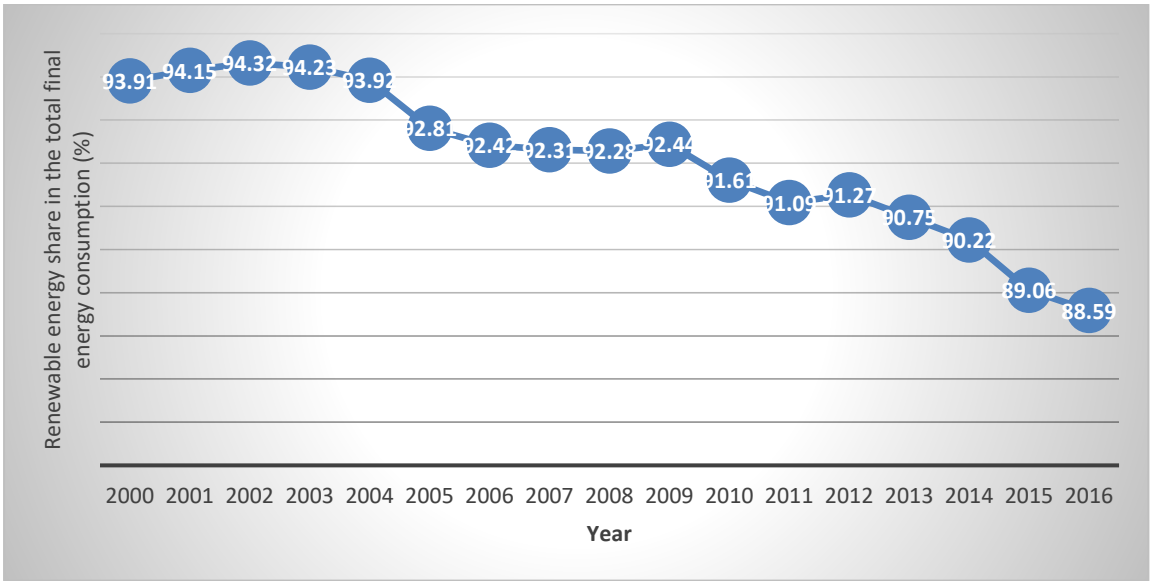

Figure 3: Trends in renewable energy share in the total final energy consumption (%) 2000-2016 (UN Stats, 2019)

Clean Water

Relevant SDG 6 indicators
6.3.1 Proportion of wastewater safely treated
6.3.2 Proportion of bodies of water with good ambient water quality
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.
6.6.1 Change in the extent of water-related ecosystems over time

Water Quality

Sanitation management is poor in Uganda with only 1 per cent of the urban population connected to the sewer system (WHO and UN-Habitat, 2018). In 2018, 3.76 per cent of wastewater effluent was treated. In addition, 6.2 per cent of the population practice open defecation with only 19.2 per cent having access to basic sanitation, implying a high likelihood of contaminated drinking water, especially if it is not safely managed (SDGCA and SDSN, 2018); (UN Stats, 2019). Figure 4 and Figure 5 show trends in the population using safely managed drinking water and open defecation in Uganda between 2000-2015.

The institutional setup for waste water management includes the Ministry of Water and Environment, the National Water and Sewerage Corporation, National Environment Management Authority and the Irrigation and Drainage Department of the Ministry of Agriculture, Animal Industry and Fisheries. The legal framework includes the Water Act 1995, the Water (Waste Discharge) Regulations 1998, the Sewerage Regulations 1999 and the Water Supply Regulations 1999.

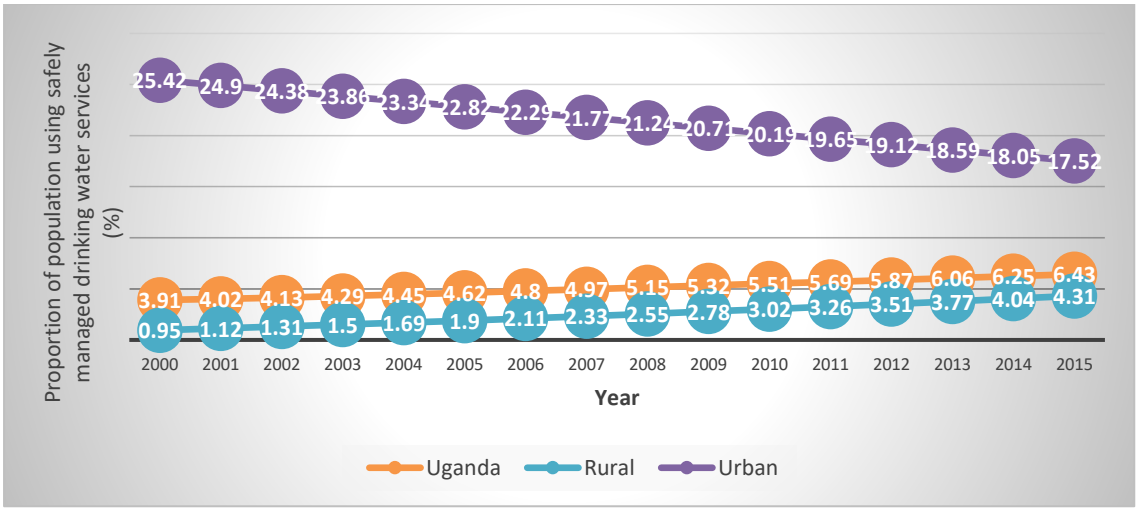

Figure 4: Proportion of population using safely managed drinking water services (%) in Uganda 2000-2015 (UN Stats, 2019)

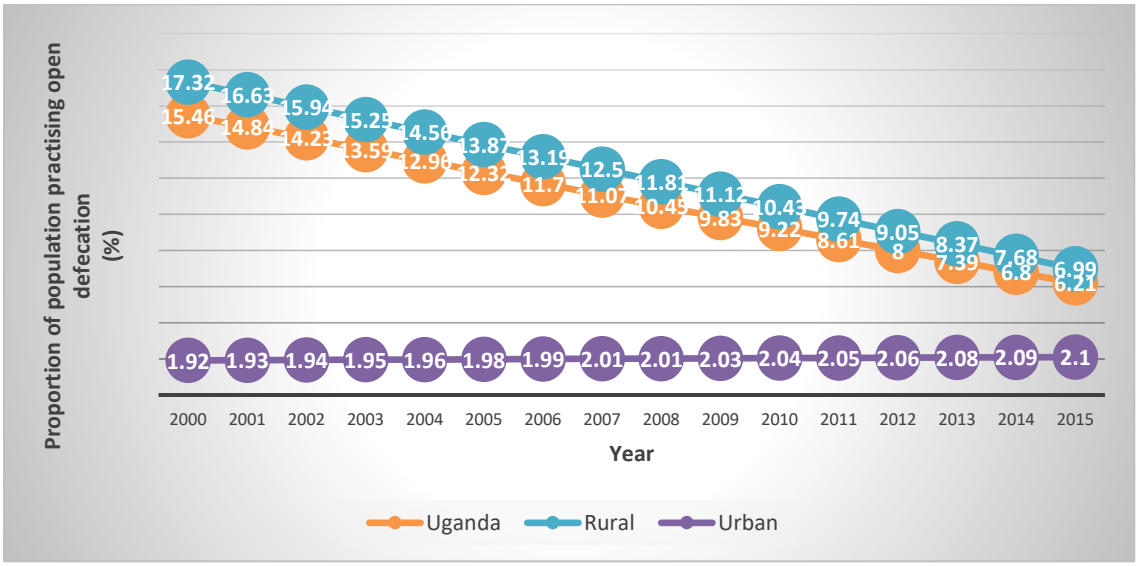

Figure 5: Trends in open defecation in Uganda 2000-2015 (UN Stats, 2019)

Sustainable Management of Fisheries

This sector is important to the economy with fish and fish products making up 4.7 per cent of exports and 1.5 per cent of sector (agriculture, forests and fisheries) GDP in 2017 (UBOS, 2019). In 2016, total fisheries production was at 507,295 metric tonnes. Capture fisheries declined from 461,167 to 389,244 metric tons between 2014 and 2016 respectively. Aquaculture has been growing increasing from 111,000 to 118,000 metric tons over the same time period (World Bank, 2018). Figure 6 highlights this in more detail.

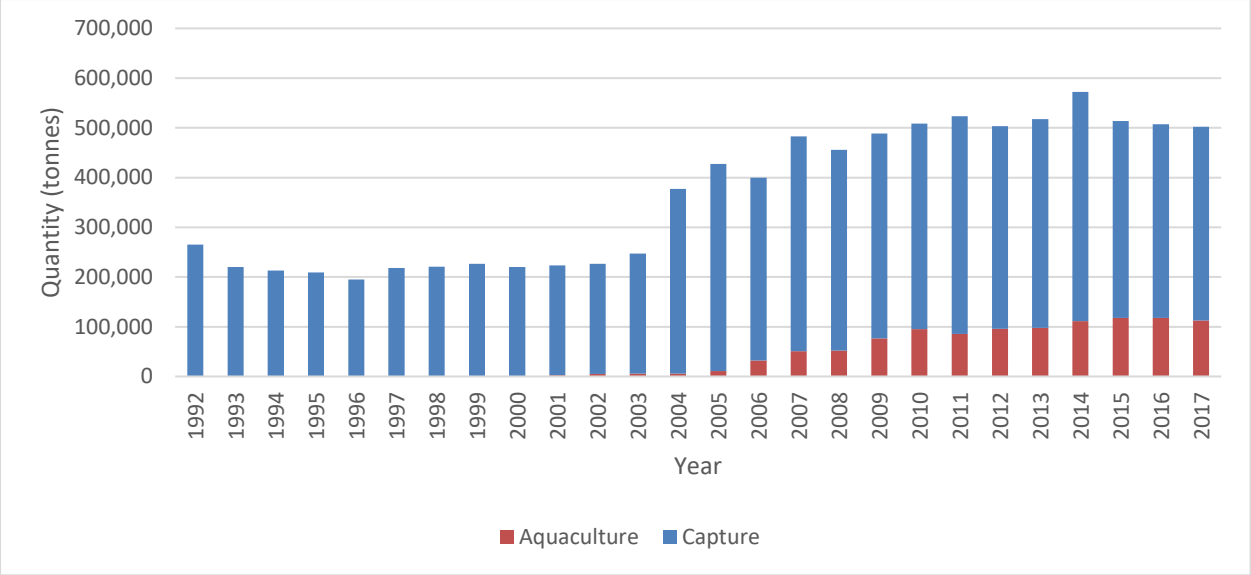

Figure 6: Total capture and aquaculture production for Uganda in tonnes (FAO, 2019b)

Illegal Fishing

Most fishing in Uganda is done by artisanal fishermen. Declining fish stock and an increasing number of fish processing factories has led to intense competition for landed fish. As a result, illegal fishing methods are being employed. These include the use of banned equipment such as cast nets, the use of small gillnets and the continued capture of juvenile fish (UNCTAD, 2017).

Relevant SDG 14 indicators

14.2.1: Proportion of national exclusive economic zones managed using ecosystem-based approaches
14.4.1: Proportion of fish stocks within biologically sustainable levels
14.5.1: Coverage of protected areas in relation to marine areas.
14.6.1: Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing.
14.b.1: Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries

Terrestrial Ecosystems: Land, Biodiversity and Forests

Tree and Forest Cover

Trees and forests are important to the economy, livelihoods and human wellbeing. In 2017/2018, forests contributed 3.5 per cent to the sector (agriculture, forests and fisheries) GDP. Uganda's forests contributions to ecosystem services such as soil and water conservation are estimated at US $89 million (MWE, 2015).

Relevant SDG 15 indicators

15.1.1 Forest area as a proportion of total land area
15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
15.2.1 Progress towards sustainable forest management
15.3.1 Proportion of land that is degraded over total land area
15.5.1 Red List Index

Forest cover is on the decline reducing from 3,860,000 to 2,077,000 ha between 2000 and 2015 (UN Stats, 2019); and since 1990, the country has lost 60 per cent of its forest (UBOS, 2019). See Table 3Table 1, Figure 7 and Figure 8.

Table 3: Forest area as a proportion of total land area 2000-2015 (UN Stats, 2019)

Year	2000	2005	2010	2015
%	19.29	17.10	13.72	10.35
‘000 ha	3,869	3,429	2,753	2,077
		-2.38	-4.29	-5.47

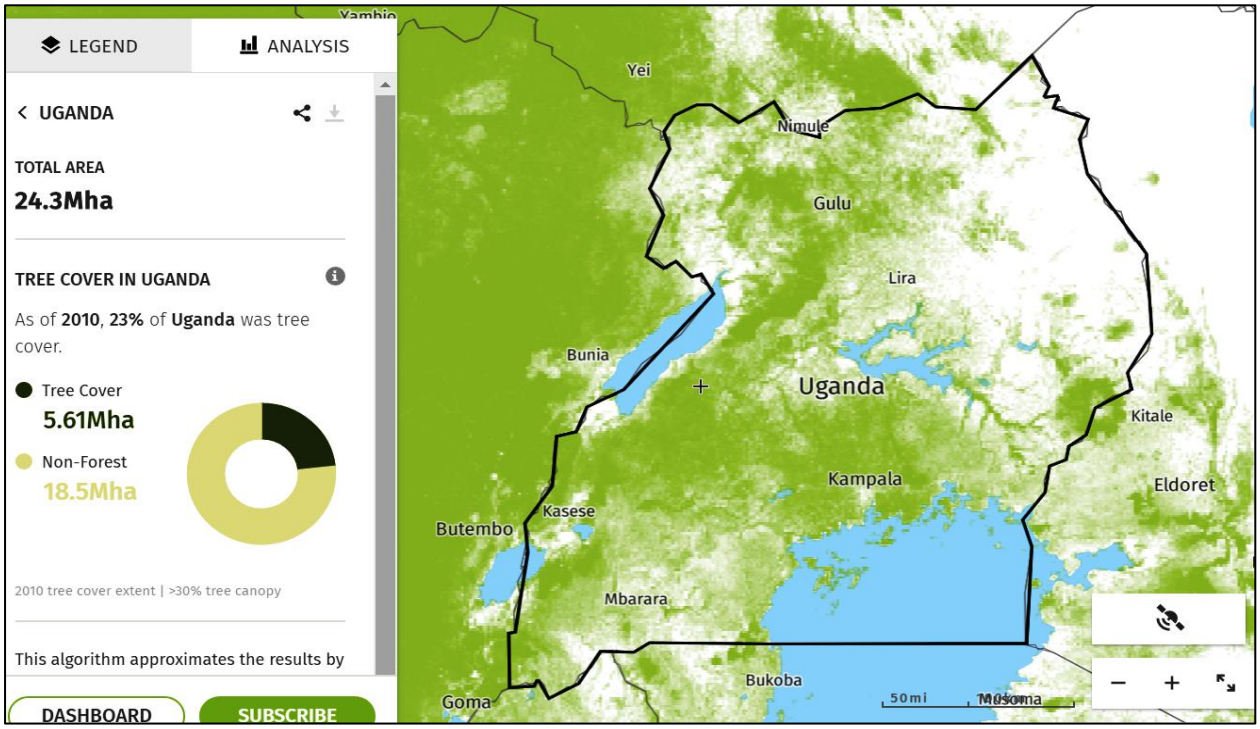

Figure 7: Uganda with a 30%+ tree canopy (2010). Data source: Global Forest Watch

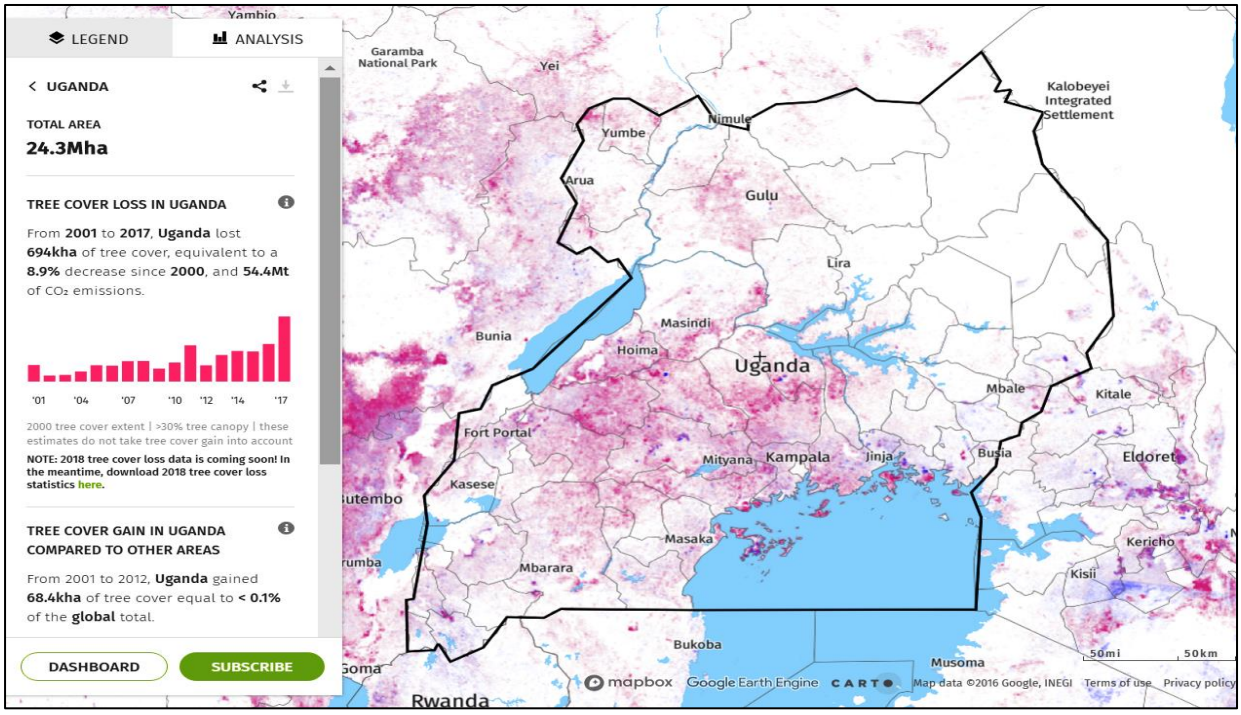

Figure 8: Tree cover loss in Uganda 2001-2017. Data source: Global Forest Watch

Encouraging Sustainable Forest Management

The environmental value of forests as measured by above-ground biomass is increasing – from 60.48 tonnes/ha in 2000 to 61.68 tonnes/ha in 2015 (UN Stats, 2019). The proportion of forest within legally established protected zones has also increased has been 35.19 between 2000 and 2015 (UN Stats, 2019).

However, illegal harvesting and trade in illegal timber are major issues as is encroachment from agriculture. The policy and legal framework for sustainable forest management includes the National Forestry Policy 2001 and National Forestry and Tree Planting Act 2003. Vision 2040 also includes tree planting actions to restore forest cover across the country.

Protected Areas

The number of threatened species among the birds, fish, mammals and higher plants in Uganda stands at 30, 60, 31 and 64 respectively (World Bank, 2017).

The Red List Index is a measure of extinction risk, and data from Uganda shows has been on a slow but sure downward spiral and in 2019 was estimated at 0.75 down from 0.80 in 2000 (UN Stats, 2019). This implies a certain level of degradation of the biodiversity resource.

The management of biodiversity is guided by the National Biodiversity Strategy and Action plan 2015-2025. Some of the policies and laws relevant to biodiversity include the National Biotechnology and Biosafety Bill 2012, Uganda Wildlife Education Centre Bill 2013, the National Wildlife Research and Training Institute Bill 2013 and the Uganda Wildlife Policy 2014.

The proportion of freshwater biodiversity covered by protected areas was estimated at 65.69 per cent in 2018 up from 43.43 in 2000 and 46.31 in 2005. The proportion of terrestrial biodiversity covered by protected areas was estimated at 75.73 in 2018, which was an increase from 62.81 per cent in 2000 (UN Stats, 2019). See **Figure 9**.

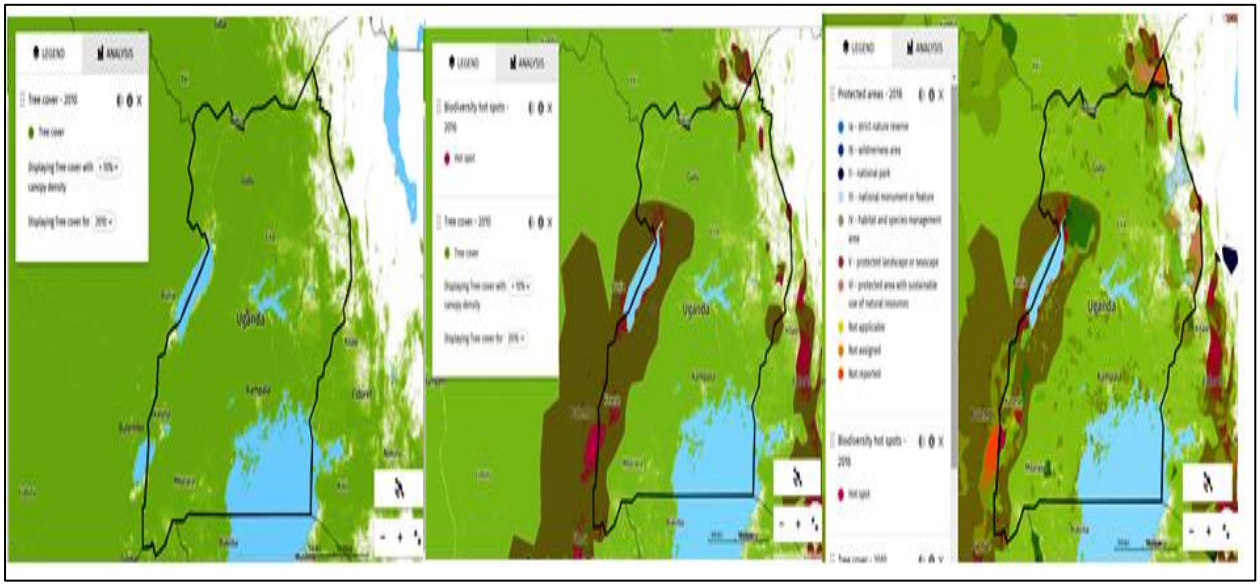

Figure 9: From left to right – Uganda with a 10%+ tree canopy cover (2010), then with hotspots (2016) and then protected areas (2018) Data source: Global Forest Watch

Emerging Environmental Challenges

Relevant SDG 12 indicators
12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment
12.5.1 National recycling rate, tons of material recycled

Waste Production and Management

Municipal solid waste generated per annum is 0.3 kg per capita while the generation of e-waste is 0.9 kg per capita (SDGCA and SDSN, 2018).

Uganda is 16.6 per cent compliant with the requirements of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; 39.2 per cent complaint with the Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade; 50 per cent compliant with the Stockholm Convention on Persistent Organic Pollutants; and fully compliant with the Montreal Protocol on Substances that Deplete the Ozone Layer.

At national level, the legal and policy framework includes the Kampala City Council Authority Solid Waste Management Ordinance 2000, Solid Waste Management Strategy 2006, the National Environment (Waste Management) Regulations, S.I. No 52/1999.

Relevant SDG 13 indicators
13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other
13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions

Climate Change

The Climate Change Department under the Ministry of Water and Environment is responsible for implementing and ensuring Uganda meets the obligations under the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

The country has also localized these protocols by adopting the following: a National Adaptation Program of Action (NAPA), National Climate Change Policy 2015 and the Climate Change Bill 2018 which has been approved to pass into law. It provides a framework for enforcing climate change adaptation actions and for Uganda to pursue its voluntary mitigation targets of reducing national greenhouse gas emissions.

The country has also developed a strategy to ensure the integration of climate change concepts into the formal education system starting with the upper primary classes.

Relevant SDG 15 indicators
15.a.1 and **15.b.1** Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems
15.c.1 and **15.7.1** Proportion of traded wildlife that was poached

Financing Natural Resources Management

Expenditure on environment has varied over the years from a low of US $2.63 million in 2002 to US $64.22 million in 2016 as shown in Figure 10**Error! Reference source not found.**. National data shows that the share of donor funded development expenditure that goes towards environment protection has ranged from 2.5 per cent in 2013/14 to 0.2 per cent in 2017/18 (UBOS, 2019).

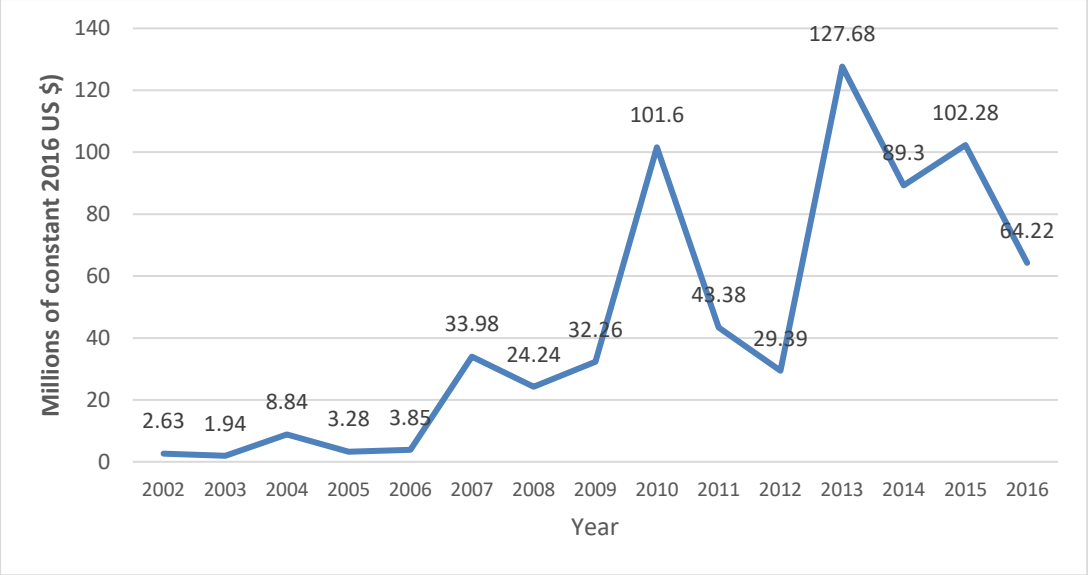

Figure 10: Total official development assistance for biodiversity (millions of constant 2016 US $) 2002-2016 (UN Stats, 2019)

Supporting Actions to End Hunger

Sustainable Fisheries Management

The establishment of beach management units in 2003 was an attempt to encourage sustainable fishing practices at the landing sites. Their mandate included regulating the catch size, and regulating mesh size of fishing nets. There is a Fisheries and Aquaculture Bill, 2018 that addresses aquaculture issues such as the organization of commercial fishing, post-harvest handling, fish transportation and trade, inspection and control monitoring of fisheries units and fisheries research.

Uganda is a member of the Committee on Inland Fisheries and Aquaculture of Africa (CIFAA) and the Lake Victoria Fisheries Organization (LVFO). The country is also party to the 1982 UN Convention on the Law of the Sea and a signatory to the 1995 UN Fish Stocks Agreement.

Sustainable Management of Mountain Ecosystems

The proportion of mountain key biodiversity areas has been increasing very slowly over the years. In 2000 it was estimated at 83.4 per cent and increased slightly to 83.7 per cent in 2018 (UN Stats, 2019).

Relevant SDG 15 indicators

15.4.1 Coverage by protected areas of important sites for mountain biodiversity

Sustainable Management of Biodiversity

The National Environment Management Authority is the focal point for implementing the Convention on Biological Diversity, which Uganda is a signatory to. The second National Biodiversity Strategy and Action Plan 2015-2025 was approved in 2016 with the main aims of improving biodiversity conservation, management and sustainable use and fair sharing of the benefits.

Relevant SDG 15 indicators

15.6.1 Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits

15.8.1 Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species

15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020

The Aichi Biodiversity target 2 has been integrated into the National Development Plan, the budget framework papers, ministerial policy statement and district development plans.

The National Biodiversity Strategy and Action Plan 2015-2025 highlights specific actions to promote food security such as maintaining seed banks as genetic adaptation to climate change; and proposes protection measures to guard against food insecurity when introducing crop bio-fuels (NEMA, 2016). At an international level, Uganda is a party to the International Treaty on Plant and Genetic Resources for Food and Agriculture and the Convention on Biodiversity-Nagoya Protocol. There are already positive outcomes such as a community seed bank established in 2018 in Hoima (western Uganda) which has now become a repository of local and regional food crop diversity for over 50 food plant varieties adapted to prevailing local climatic and environmental conditions (Otieno, Mulumba, Namulondo, & Halewood, 2017). Other relevant laws include the National Land Use Policy 2011 and the Plant Variety and Protection Health Bill 2010.

Woman displaying a variety of beans. Source CGIAR.org

Conserving Agricultural Biodiversity

The National Agricultural Research Organization established in 2005 is in charge of all agricultural research activities in Uganda. Other supporting laws for agricultural biodiversity include the Seeds and Plant Act 2006 and the Plant Variety Protection Act 2014. The Agriculture Sector Strategic Plan 2015/16-2019/20 guides the sector.

Sustainable Water Resources Management

Relevant SDG 6 indicators

6.5.1 Degree of integrated water resources management implementation (0-100)

6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation

On a scale of 0-100, the degree at which Integrated Water Resources Management is undertaken is 59 (UN Stats, 2019). The Ministry of Water and Environment is the lead institution for IWRM in the country. There is a legal and policy framework which includes the National Water Policy 1999, the Water Act 1995, the Water Resources Regulations and the National Water Resources Strategy and Action Plan among others.

Transboundary Water Resources Management

Much of Uganda is covered by transboundary or shared waters. The Nile basin covers 90 per cent of the country and its cooperative framework is the Nile Basin Initiative. The organizational framework for Lake Victoria, another shared water body, is the Lake Victoria Basin Commission. The percentage of transboundary basin (rivers, lakes and aquifers) area with an operational arrangement for water cooperation is estimated at 83.56 per cent while that for rivers and lake basins was 97.54 per cent (UN Stats, 2019).

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