WEATHERING RISK

Climate, Peace and Security Study: Uganda, West Nile sub-region

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Executive summary

As part of the Weathering Risk initiative, adelphi and the World Food Programme (WFP) set up a learning facility to explore entry points for WFP to strengthen its climate adaptation and resilience programming, and how this can contribute to maintaining and building peaceful societies in Eastern Africa. Climate change and environmental pressures have severe cascading effects on peace and human security in the region, ranging from climate migration and displacement, food insecurity and conflict over dwindling natural resources. In response, this learning facility explores entry points for WFP to, in addition to its core humanitarian mandate as first responder, undertake a more systemic and long-term approach to strengthening climate adaptation and building climate-resilient food systems as ways to prevent, mitigate and resolve violent conflicts.

This climate, peace and security study, focusing on Uganda's West Nile sub-region, is one of the outputs undertaken during phase I of the adelphi-WFP learning collaboration. The West Nile sub-region was selected as a case study because of its unique demographic situation due to the recent influx of South Sudanese refugees, which started in 2016 and increased the total population by about 30 per cent. These rapid demographic changes, but also the effects of climate change and environmental degradation, have put natural resources of West Nile under immense stress. Despite a welcoming attitude from host communities and government, intercommunal tensions over access and control over natural resources occur, and people's livelihood and food security have become more fragile. With the combination of population growth and climate change, numerous risks are at play that could jeopardise stability in West Nile (see figure 1).

Interplay of climate security risks in West Nile
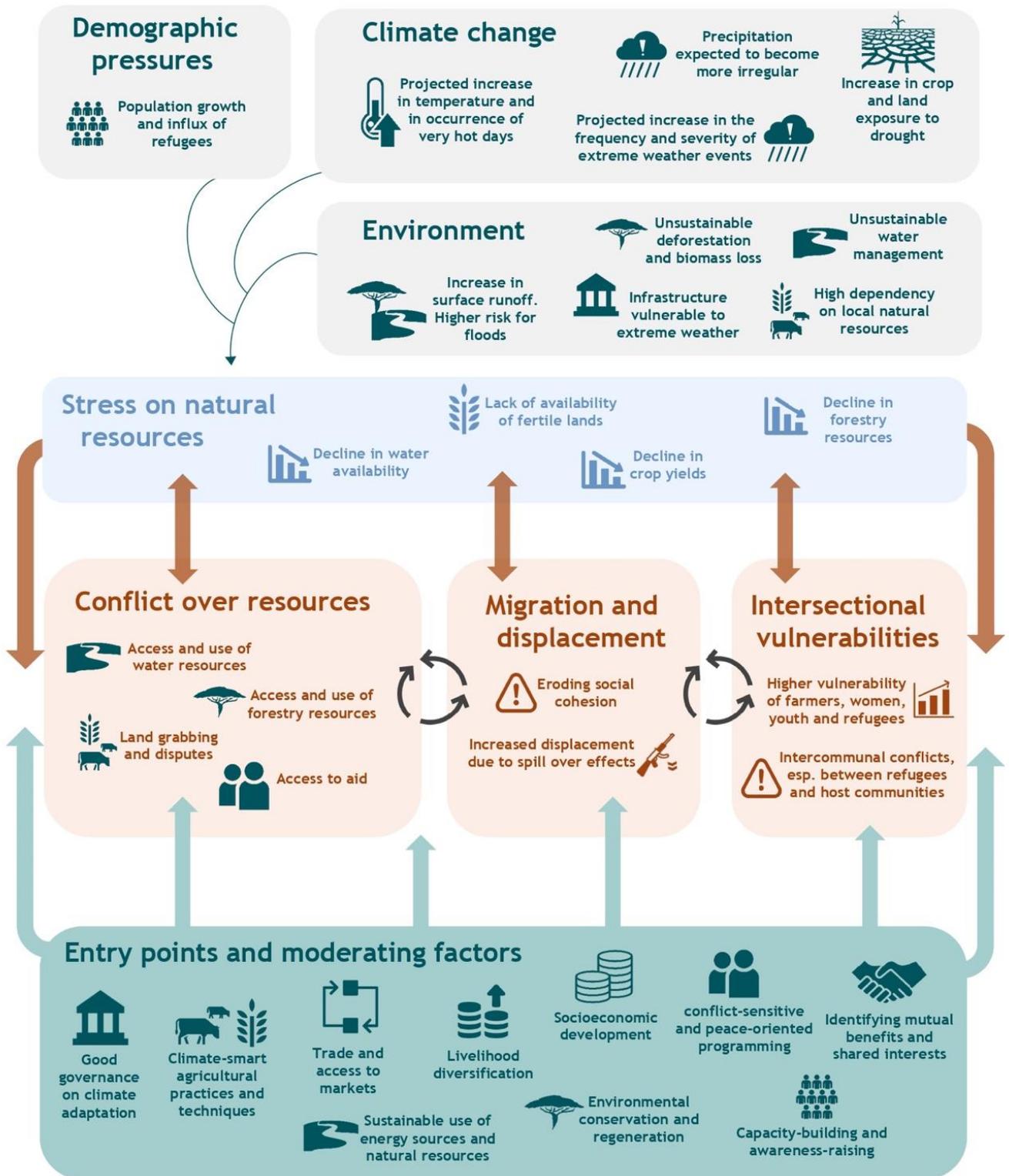
Figure 1: Interplay of climate security risks in West Nile (Weathering Risk, 2022)

Climate change in Uganda, including in West Nile, materialises in an increase in average temperature and heatwaves, more unpredictable rainfall, and increased crop and land exposure to drought. Over the past 20 years, especially the northern regions of Uganda have experienced more frequent and longer-lasting drought conditions. The livelihoods and food security of people in West Nile are highly dependent on rain-fed subsistence farming, which is vulnerable to shocks and adverse weather events related to climate change and climate variability. Droughts in West Nile have already resulted in scarcities on local food markets and inflated the prices of food staples. Even people with access to normally fertile lands have faced severe climate driven variability in recent years, contributing to increasing livelihood insecurity.

In addition to these climate change impacts, the influx of refugees has put the local environment further under strain. In particular forestry, agricultural land, and water resources are scarcer and more difficult to access. Fertile land is an important but traditionally sensitive resource in West Nile, essential for cultural identity and for sustaining livelihoods and the local food basket. Land ownership in West Nile also has a complicated history, marred by conflict and political interference. The Ugandan authorities have negotiated with local community leaders to acquire land for use by refugees. However, in some cases the allocation of portions of land to refugees caused resentment amongst the local population and intercommunal tensions.

Forestry resources in West Nile are also a source of tension and potential conflict. Trees are being cut down at an unsustainable rate due to the spike in demand for energy sources driven by the rapid population growth, but also because the vast majority of refugee and host population households still rely on wood as primary cooking fuel. This problem is particularly critical in rural areas and around refugee settlements, where forestry management is weak and unsustainable. A scarcity of forestry products increases the risk of tensions and conflict around the competition to control and access these resources. It also heightens the risk of sexual- and gender-based violence, as women and girls are primarily responsible for collecting firewood, and a lack thereof means they have to spend more time and cover greater distances in this process.

Further, per capita water availability in West Nile is expected to continue to decline, due to population growth, the effects of climate change and poor water infrastructure. While conflicts over access and availability of water in West Nile are still rare, communal competition and small-scale conflicts over water points and natural springs are already occurring. As most of the population in West Nile is dependent on rain-fed subsistence farming, a further decrease in water availability will directly impact people's livelihoods and food security, risking water becoming more salient in conflict dynamics.

Access to aid and development resources - including food distributions - available to refugees in West Nile has also been a major point of contestation amongst host communities. Refugees have a shared interest that the host population also benefits from these resources, as they depend on their goodwill to be accepted. However, when non-aid resources become scarce, this could increase competition and resentment over aid relief, during which the host community could perceive themselves as unfair losers of the refugee presence.

Finally, West Nile also experiences risks related to climate- and conflict-induced migration and displacement. Firstly, further deterioration of the security situation in South Sudan could result in a renewed influx of refugees in West Nile, leading to

increased pressures on livelihoods and food security, potentially driving communal conflict. On the other hand, more stability in South Sudan may result in out-migration as refugees decide to return home, which could relieve some of the current pressures on land, forestry and water resources. In the mid- to longer term, changes in internal migration patterns and trends in Uganda could lead to increased demographic pressures, including in West Nile. For instance, when the arid north-eastern regions of Uganda become less suitable for livestock rearing due to climate change, the more fertile north-western regions could serve as better alternatives for herders in search of grazing lands. Poorly managed seasonal migration could quickly lead to transhumance-related conflicts, as seen in other regions in sub-Saharan Africa. In contrast, accelerated deforestation and further decreases in water availability and crop production in West Nile could also lead to major out-migration hotspots in the future. Finally, such climate-induced human mobility could lead to a population spatial shift from rural to urban areas, causing demographic pressures in regional towns.

As intra and inter-communal conflict in West Nile over access to and use of forestry, water, fertile land, and aid risk to worsen due to demographic pressures, climate change and environmental degradation, this report has explored ways to build climate resilient livelihood and food systems which also contribute to peaceful societies. As climate, peace and security are interconnected, the responses to them must also be interconnected. By linking climate change adaptation to peacebuilding, both host and refugee communities in West Nile can increase their resilience to climate security risks. This report identifies a number of entry points for WFP and partner organisations to further explore, such as livelihoods diversification, strengthened regulatory frameworks and natural resource sharing agreements, climate-smart agricultural practices and techniques, sustainable use of energy, and environmental conservation and regeneration. One critical, cross-cutting element is that initiatives need to draw linkages between climate adaptation and social cohesion, which is essential for managing conflict and building sustainable peace. This includes identifying synergies between climate adaptation and activities that help bridge communities and strengthen social relations, as well as focus on opportunities to work towards shared interests, common goods and mutual benefits between and within communities, especially between refugees and host communities.

In recent years, the World Food Programme (WFP) has been one of the key humanitarian actors in West Nile to support refugees. The primary focus for WFP in West Nile has been crisis response via in-kind and cash-based general food assistance for refugees. In addition to WFP's mandate as a first responder to crises, this report explored additional avenues for WFP to contribute to building climate-resilient food systems and sustainable peace. Some non-exhaustive and complementary entry points are summarised in the table on the following page.

No.	Area	Entry points and priorities for WFP
1	**Promoting climate-smart agriculture**, which includes tools and practices to support farmers and pastoralists to build resilience to climate pressures and increase productivity.	• Collaborate with partners and local stakeholders to **identify needs / challenges** related to climate-smart agriculture. • **Explore approaches** like agroforestry, urban farming, promoting nutrient-dense foods, intercropping, bio-fortified crop varieties, high-yielding seed varieties, and supporting enhanced food storage and post-harvest handling. • **Promote mixed groups** of participants to strengthen social cohesion within and between communities.
2	**Livelihood diversification**, which can help communities dependent on natural resources adapt to environmental shocks and build resilience.	• Develop a **strategy to diversify livelihoods**, particularly for refugees, while ensuring alternative livelihoods do not have negative environmental impacts. • **Enhance refugees' access to markets**, for instance by scaling WFP's Agriculture and Market Support (AMS) programme. • **Promote synergies** within and between communities.
3	**Sustainable management of natural resources**, which is essential for ecosystem services, food security, and the ongoing viability of pastoralism and agriculture. Forestry, water, wetland and fertile land resources must be better managed.	• Identify and build on **shared interests and mutual benefits** between and within communities. • Help to **broker formal and informal natural resource sharing agreements** between refugees and host communities. • Explore ways to **increase water availability,** e.g. through irrigation systems and water capture and storage. • Invest in **reforestation and conservation projects**, particularly around agroforestry. • Support / lead efforts to **protect wetlands from degradation.** • Promote **energy-saving and green cooking systems,** including solar, to minimise use of firewood and charcoal.
4	**Draw linkages between climate adaptation and social cohesion**, which is essential for managing conflict and building sustainable peace.	• **Identify synergies** between climate adaptation and activities that help **bridge communities** and **strengthen social relations.** • Focus on opportunities to work towards **shared interests**, **common goods** and **mutual benefits** between and within communities, especially between refugees and host communities.
5	In line with entry point 4, **WFP should integrate a climate- and conflict-sensitive, peace-oriented approach**, which actively seeks to prevent conflict, enhance climate resilience and build	• Adopt a **conflict-sensitive and peace-oriented approach** to inform design, implementation, monitoring and evaluation of programmes and projects. • Develop specific **climate, peace and security indicators and objectives** that enhance social

	sustainable peace, and considers how WFP's interventions interact with its context and follows the 'do no harm' principle.	cohesion, build synergies and improve relations between and within communities. • **Appoint designated staff and focal points** that are responsible for mainstreaming a **climate, peace and security lens** within WFP.
6	**Address research and data gaps to strengthen policy and regulatory frameworks**, through integration of climate security issues.	• Develop / implement **policies and regulatory frameworks** that contribute to climate-smart, more resilient food systems, agriculture and natural resources management. • Address **research gaps** by collaborating with partners / stakeholders to **collect and analyse climate and food-related data**. • Integrate **climate modelling and projections** into WFP's reporting and assessments
7	**Capacity-building and awareness raising,** to improve the delivery of climate information across different sectors of the food system.	• Collaborate with partners / stakeholders to **develop programmes that can build capacity** in climate security and resilience, climate adaptation and climate-smart food programmes. • Develop **information products targeting climate fragile communities**, e.g. related to weather forecasts, seasonal forecasts, agricultural information etc. • Incorporate **climate security information** for the different components of food systems **in early warning systems** and emergency response mechanisms.
8	**Partnerships and coordination,** to strengthen climate adaptation and resilience-building.	• WFP could establish new **partnerships** and strengthen existing ones to bring in more experience and expertise around climate- and conflict-sensitive programming in West Nile. Especially partnerships with local actors should be fostered. • WFP could develop a **climate security and adaptation platform** to periodically bring together different actors and stakeholders in West Nile, during which relevant issues could be discussed. This will also lead to fruitful exchanges and improved planning and coordination of activities.

Table 1: Summary of entry points and priorities for WFP

Introduction

Climate change and its impacts can have severe risks to food systems and human security more broadly, making peaceful coexistence between people and communities harder to maintain or achieve. Both slow onset changes such as temperature rise and increased variability in precipitation patterns, as well as fast onset events such as extreme weather events can severely affect people's livelihoods and food security, especially in contexts that are already fragile and impacted by conflict. These cascading effects can lead to further socioeconomic and political instability, increasing the risk of violent conflict.

As part of the Weathering Risk initiative, adelphi and the World Food Programme (WFP) set up a learning facility to explore entry points for WFP to strengthen its climate adaptation and resilience programming, as well as its role in maintaining and building peaceful societies in Eastern Africa. Climate change and environmental pressures have severe cascading effects on peace and human security in Eastern Africa, ranging from climate migration and displacement, food insecurity and conflict over dwindling natural resources. In response, this learning facility aims to strengthen WFP's contribution to building more climate-resilient food systems in the region as a way to prevent, mitigate and resolve climate-induced conflicts and insecurity in the region.

This climate security profile focuses on Uganda's West Nile sub-region and is one of the outputs undertaken during phase I of the adelphi-WFP learning collaboration. The West Nile sub-region was selected because of its unique demographic situation due to the recent influx of South Sudanese refugees. It is currently hosting one of the largest refugee populations on the African continent, which has put strains on access to, and availability of, natural resources, particularly fertile land and forestry. The effects of climate change have the potential to limit accessibility to, and exacerbate the current scarcity of, natural resources, consequently increasing risks of conflict.

In the past years, WFP has been one of the key humanitarian actors operative in West Nile. The primary focus for WFP in West Nile has been crisis response via in-kind and cash-based general food assistance for refugees. In addition to WFP's responsibilities as a first responder to crises, this report aims to inform how WFP could respond to environmental pressures and a changing climate in this region, and how it could support the local food system to adapt and become more resilient. It explores entry points for WFP to undertake a more systemic and long-term approach to strengthening climate resilience, climate adaptation and conflict prevention in West Nile.

Methodology

Policy- and decision-makers across multiple sectors have sought ways to predict and respond to climate impacts on peace and security. However, to do so effectively and sustainably, the complexity of different factors and interactions must be unpacked into a granular understanding of the relationship between environmental change and insecurity in a given context. In order to convert an awareness of the risks into action that improves lives, it is integral to identify concrete entry points.

This is where Weathering Risk comes in.

The Weathering Risk programme, led an interdisciplinary team from adelphi and the Potsdam Institute for Climate Impact Research (PIK), unites state-of-the-art climate impact data and expert conflict analysis to promote peace and resilience in a changing climate. It uses an innovative methodology that unpacks the complex relationship between climate change and insecurity and identifies entry points for action. Through its methodology framework Weathering Risk aims to facilitate risk-informed planning, enhance capacity for action and improve operational responses that promote climate resilience and peace.
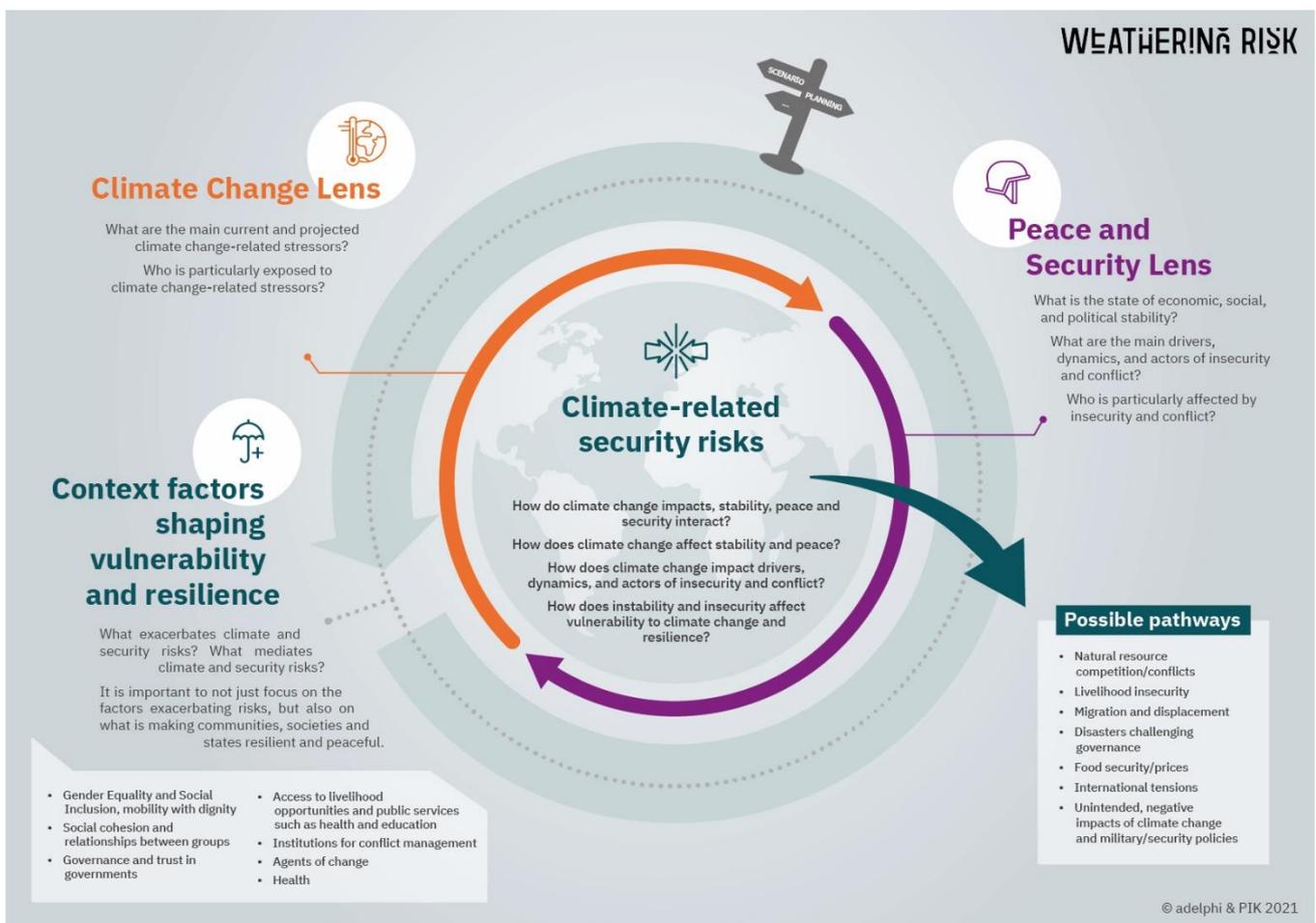

Figure 2: Weathering Risk methodology framework (Weathering Risk, 2021)

For this report, adelphi collaborated with WFP to undertake data collection in Uganda in June 2022, more specifically in Kampala and the West Nile sub-region. The research team undertook the following:

- key informant interviews (KIIs) with about 20 subject-matter experts;
- focus group discussions (FGDs) and group interviews with about 5-10 participants per session, and a total of over 80 participants;
- validation workshop to present the findings at the sub-regional and national level, which included over 50 participants from WFP, members of partner organisations, independent subject-matter experts, and government representatives.

Regional context and trends

Geography and topography

Uganda is a land-locked country located in the East African Nile Basin and surrounded by Kenya, South Sudan, Tanzania, Rwanda and the Democratic Republic of the Congo (DRC). Surrounded by several mountain ranges along its eastern, southern, and western borders, the East African country finds itself on a plateau, with the highest point the Margherita Peak (5,109m) in the Rwenzori mountains. Elevation gradually decreases towards the West Nile sub-region (north-western Uganda), where Lake Albert (614m) and the Albert Valley are the lowest elevation points nationally (Tomalka et al., 2021) (see figure 3).

Uganda is administratively divided in four regions: Central, Western, Eastern, and Northern Uganda. The latter forms about one quarter of the country and consists of three sub-regions: West Nile, Northern and Karamoja. The West Nile sub-region is divided into another nine districts[1] (see figure 3).
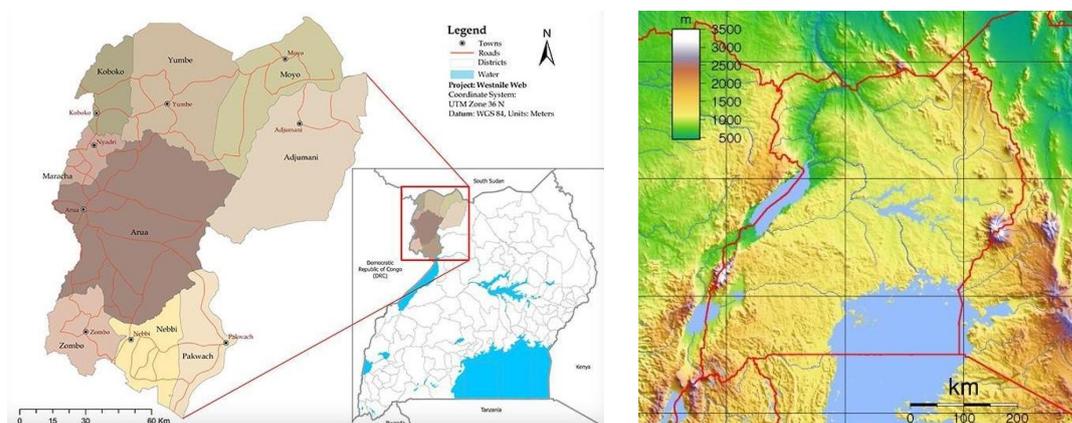
Figure 3: West Nile districts and town centres (source: West Nile Web) and Uganda topography (source: Future Climate for Africa)

Demographic and socioeconomic profile

West Nile borders both the Democratic Republic of Congo and South Sudan. It has a population of just under 3 million people, of whom approximately 80 per cent live in rural areas. Arua is the largest town in West Nile. Despite its relatively small overall population, the sub-region hosts numerous distinct local languages and ethnicities, of

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[1] Adjumani, Arua, Koboko, Maracha, Moyo, Nebbi, Yumbe and Zombo.

which the majority are Lugbara, Kakwa, Madi, and the Nilotic Alur. Other ethnicities include the Ukebu, Kuku and Nubians. West Nile also hosts a considerable number of refugees – over 1 million in 2017 and around 700.000 in 2022 -, who arrived primarily from South Sudan in 2016 due to an outbreak of violent conflict (West Nile Web, 2018).

Uganda is a low-income country with a fast-growing population that suffers from widespread poverty. Its GDP per capita in 2017 was just 606USD, much less than half of the average for sub-Saharan Africa, which stands at 1,574USD (Word Bank, 2019). Despite significant economic growth and poverty reduction at the national level in recent years, there remain strong sub-regional disparities. West Nile and northern Uganda more broadly have long faced structural challenges, such as exclusion from national political processes and persistent underdevelopment as compared to the rest of the country. Colonial divisions between the north and the south, during which the south enjoyed a privileged position, were exacerbated by successive governments after independence. This systemic marginalisation of northern Uganda continues to affect the socioeconomic situation in the region (Herbert and Idris, 2018).

Overall development indicators for the wider region, including West Nile, remain significantly weaker in comparison to central and southern Uganda. West Nile is amongst the least developed regions in Uganda, with over 84 per cent (national: 70 per cent) of people multidimensionally poor and nearly 60 per cent living in severe poverty (national: 37 per cent) (see figure 4) (AAH, 2017).
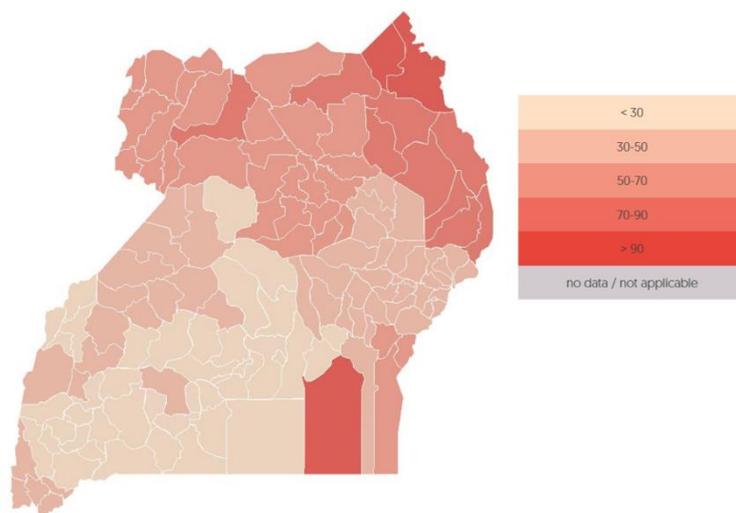
Figure 4: Poverty headcount (per cent) at district level for 2014 (source: Development Initiatives, Spotlight on Uganda)[2]

The West Nile sub-region has long functioned as a key transit point for trade along the Albert Nile River. Nowadays, both formal and informal cross-border trade remain critical for its economy. For this reason, the sub-region is highly dependent on its road, railway, and water transport networks, which link the Nile-bisected region with other Ugandan regions and neighbouring countries. The regional capital Arua has large business establishments and warehouses where beverages, food, fabric and other goods are distributed within the region and to neighbouring countries (UN-Habitat, 2021). The Uganda Vision 2040 plan listed some specific ambitions for West Nile, such as the

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[2] The poverty headcount on the map is based on the international poverty line (PPP$1.90 per day). It does not consider the depth of poverty.

development of a new air transport and railway, and the promotion of Arua to the status of 'regional city' (UNPA, 2013).

The vast majority of the West Nile population generates income from subsistence farming, which is further elaborated in the section on food systems. Another key pillar of the economic fabric in West Nile comes from international development and humanitarian aid. Approximately 60 per cent of refugee households' income comes from food aid or cash, which then flows into the local economy. Local populations, in addition to refugees, benefit from aid programmes as a way of compensating for their hospitality towards refugees households (UN-Habitat, 2021).

Migration and displacement

Uganda has a longstanding 'open-door' policy towards refugees and is generally considered as one of the world's most progressive countries on refugee protection. It is known for promoting refugee integration rather than confinement. Direct aid resources target both the refugee population as well as the host population (Easton-Calabria, 2021; DRC et al., 2018). Refugees have the right to work, to move freely and to benefit from most of the same social services as Ugandans (Uganda Refugee Act, 2006; Uganda Refugees Regulations, 2010).

In 2016, the deteriorating security situation in South Sudan triggered a large-scale influx of refugees into West Nile. The number quickly surpassed 1 million refugees and made Uganda the top refugee-hosting country in Africa. The Bidibidi refugee settlement in West Nile became the largest refugee camp in the world, and today it remains amongst the most populated refugee settlements globally (DRC et al., 2018). As of early 2022, the West Nile sub-region hosts over 736.000 registered refugees, of which some 634.000 refugees are from South Sudan. The majority reside in the districts of Yumbe (232.000), Adjumani (213.000 refugees) and Arua (183.000 refugees) (UNHCR, 2021). A significant number of refugees have opted not to register in settlements but to instead move into urban areas, where they use the cities' services, rent accommodation and try to work in both the formal and informal sector. This means that the actual number of migrants and refugees who arrived in the past years may be much higher. The refugee population is generally young and poor, as access to employment remains very limited. Livelihood systems depend primarily on aid, with some involved in agriculture, informal business and casual labour (UN-Habitat, 2021).

Refugee households in West Nile are generally poorer and less resilient than host community households. The former have lower education levels, poor diversification of income sources, and a limited number of cultivated crops. They also report a low level of productive assets, such as land for cropping and livestock. Refugees are also more food insecure and heavily rely on assistance as a main source of food and income (FAO, 2018). Another study found that in late 2019, about 79 per cent of refugees (15+ years old) in West Nile were either not in the labour force or unemployed. About 9 per cent were active in agriculture and livestock, and an estimated 9 per cent were self-employed. These figures have most likely not changed much since the time of reporting (WFP, January 2020).

Despite the fact that Uganda is a favourable environment in terms of refugee protection, the influx of refugees and the population spike in West Nile has led to increased pressure on the host community, as already limited resources and livelihoods have to be shared (GIZ, 2019). Despite these challenges, local attitudes towards migrants and

refugees in West Nile are inclusive overall, and host populations have developed positive relations with refugees. (UN-Habitat, 2019).
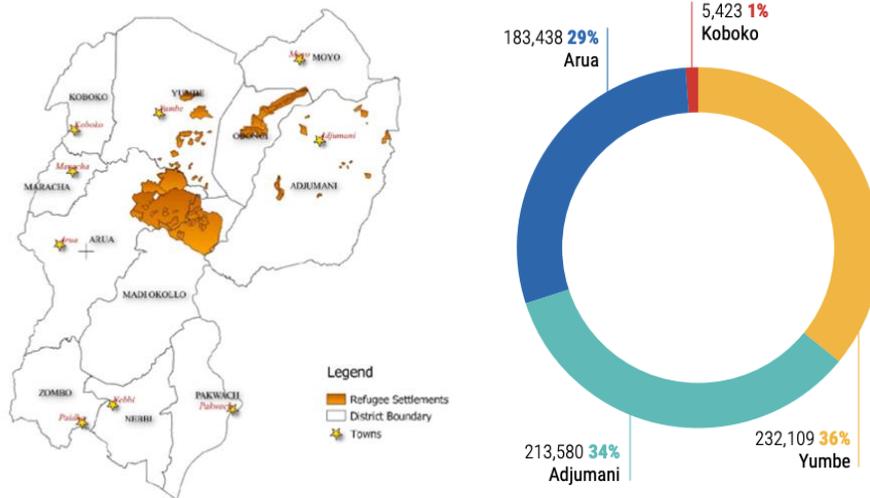
Figure 5: Refugee settlements and number of South Sudanese refugees in West Nile (source UN-Habitat and UNHCR, 2021)

Food and agriculture

The vast majority of the West Nile population generates income from subsistence farming. Most of the refugees and host communities also identify as crop farmers. For refugees, one of the main challenges related to farming is having secure access to fertile land. For host communities it is difficult to secure access to water for production (FAO, 2018). West Nile consists of several livelihood zones directly linked to agriculture and livestock rearing (see figure 6).

Note: This map is a consolidation of the 2010 national livelihood zoning, and the updated zoning completed in 2013 in the Karamoja region.

Figure 6: Uganda livelihood zones (source: FEWSNET)

Coffee cultivation (Arabica) occurs in the highlands, while the cultivation of cotton, cassava, tobacco, banana, rice, sugar cane, groundnut, sorghum and other fruits and vegetables occurs in the lower areas. Most of the produce directly contributes to the

regional food basket, while tobacco, coffee and cotton are important cash crops. West Nile is the leading producer of tobacco and cotton within Uganda. Non-traditional cash crops such as sunflower have also been adopted for export. In addition, local markets emerged to produce timber and millet (UN-Habitat, 20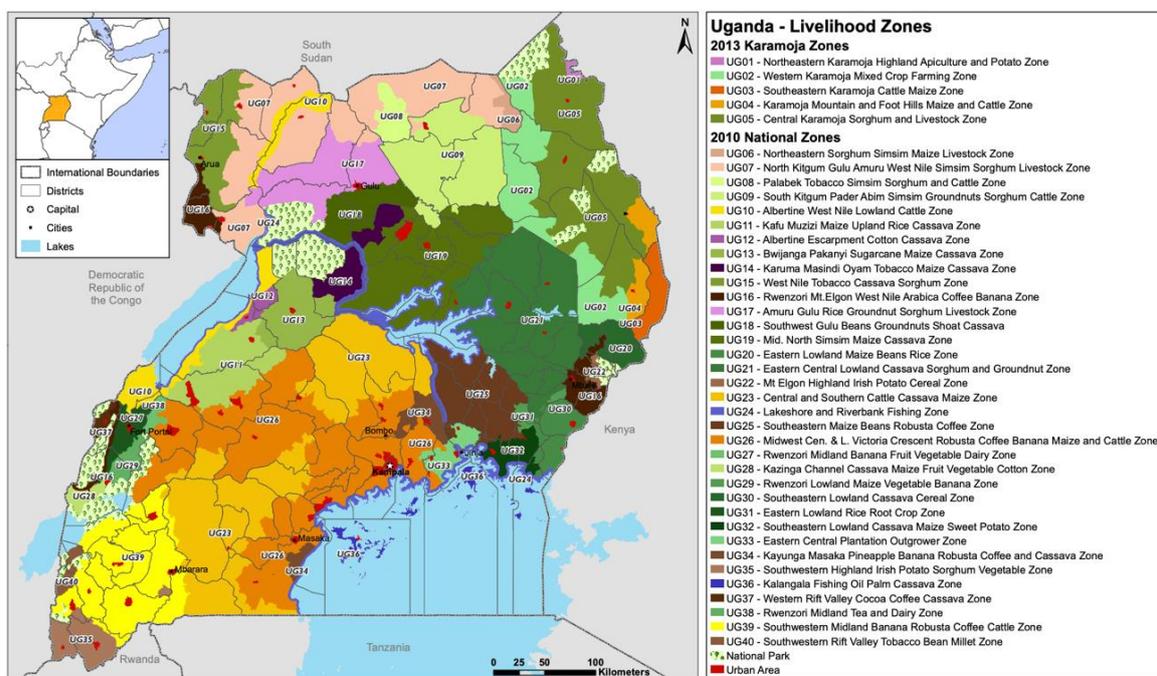21) while rice production has attracted labour migrants from other regions. Food processing facilities include some maize and cassava milling plants, as well as bakeries and distilleries producing local gin. If production could be enlarged, cassava has the potential to become a cash crop for the national market. There are also national programs for fostering entrepreneurship and small businesses, as well as women empowerment programmes, that focus on supporting the potential honey industry or small-scale cassava milling (UN-Habitat, 2019).

Another significant portion of land in West Nile is used for livestock rearing, mostly goats, sheep, cattle, and pigs. Fisheries and poultry are also important economic activities that contribute to the local food basket (FEWSNET, 2011). Livestock production in Uganda could be expected to increase due to population growth and heightened demand of animal source foods. The Government of Uganda is implementing a variety of policies and strategies to increase the productivity of the livestock sector.[3] The growth and transformation of the livestock sector could not only bring major economic opportunities, but also some serious challenges. Due to growth in the animal and human population, there will be increased risk of outbreaks and spread of zoonotic diseases, including infectious emerging and re-emerging diseases. In addition, a high level of livestock production poses an immense environmental challenge. The competition for land, feed and water is already fierce, and is expected to increase in the future. Bad management and lack of regulations could result in land degradation, soil and water pollution, high levels of greenhouse gas emissions and biodiversity loss (FAO, 2019).

At the national level, Uganda's Global Hunger Index (GHI) score is 31.2, which lies on the upper end of the 'serious' category.[4] Even though there is substantial variation in food and micronutrient intakes across regions, as well as between urban and rural areas, the typical diet in Uganda is relatively low in dietary diversity and micronutrient-rich foods. The West Nile sub-region, together with other northern districts such as Karamoja, are among the most food insecure regions of Uganda and have long been heavily reliant on donor food assistance. West Nile scores amongst the lowest along several indicators compared to other Ugandan regions and the national level, including child stunting (34 per cent), child wasting (10 per cent) and child mortality (9 per cent) (UBOS, 2018) (see figure 7).

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[3] These are guided by the Agriculture Sector Strategic Plan (ASSP) 2015/16 – 2019/20, which prioritizes investments in beef, dairy cattle, poultry and goats as well as in other agricultural commodities.

[4] The GHI severity scale is as follows: ≤ 9.9 (low), 10.0–19.9 (moderate), 20.0–34.9 (serious), 35.0–49.9 (alarming), ≥ 50.0 (extremely alarming).

Legend:
- Prevalence of wasting in children under five years
- Prevalence of stunting in children under five years
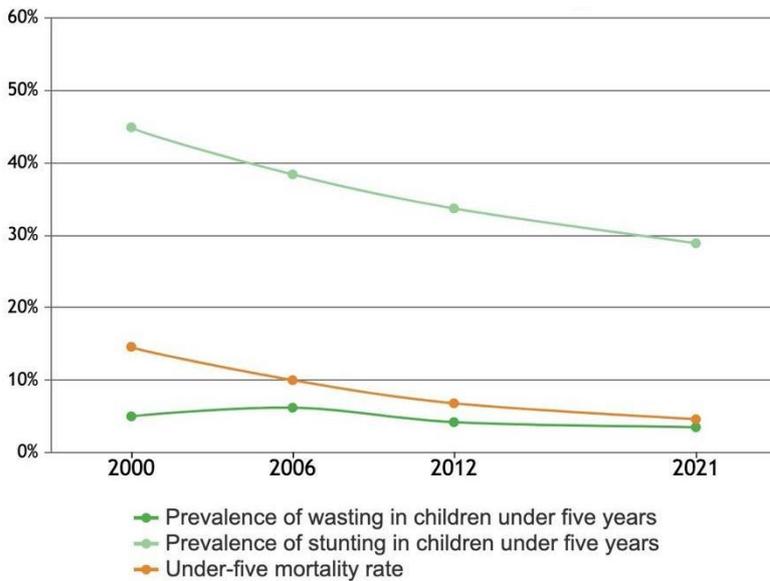- Under-five mortality rate

Figure 7: Trend at Uganda national level for food security indicator values (Global Hunger Index)

Poor nutrition scores for West Nile are partly due to the region's large refugee population, which has high rates of undernutrition. According to one study, the proportion of refugee households experiencing moderate and severe food insecurity was much higher in comparison to host communities' households (FAO, 2018). Most of the population in West Nile is dependent on rain-fed subsistence farming, and hence food security and the resilience capacities of households are mainly threatened by natural shocks such as drought, water shortage and fire. The refugee population appears to be the most vulnerable to this, as refugees are more likely to be living in extreme poverty and face food insecurity than the host populations, even though they receive food assistance (Buzigi 2018; GHI, 2019). At different points across their lifecycle, refugees experience several risks related to poverty and food insecurity (WHP, January 2020).
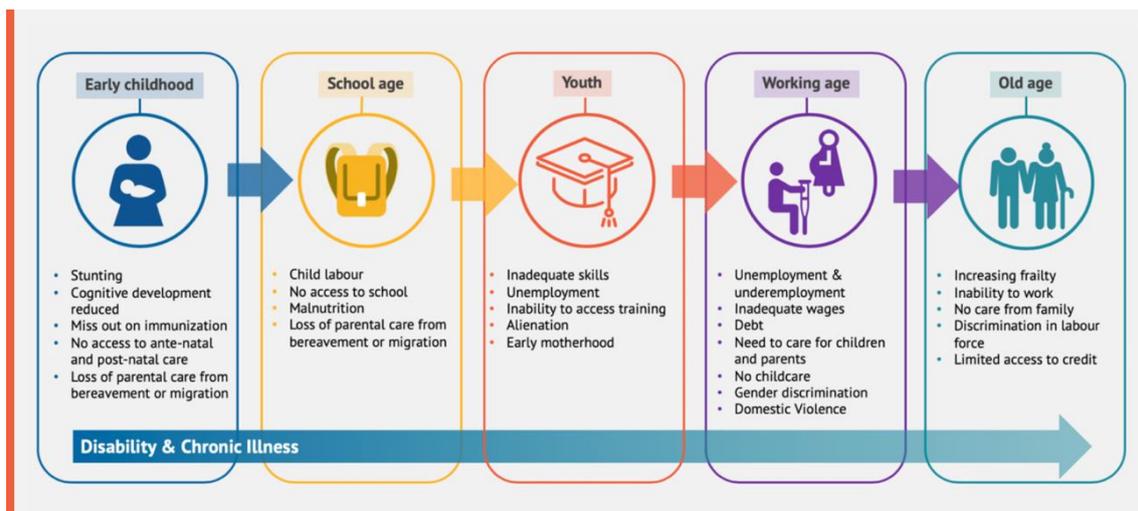
Figure 8: Risks experienced by refugees in West Nile at different points across the lifecycle (WFP, January 2020)

Refugees in West Nile remain highly dependent on food aid, with one study noting a dependency rate of nearly 79 per cent (UN-Habitat, 2021). Another study found that about 65 per cent of refugee households relied on assistance for food consumption, compared to a mere 4 per cent amongst host community households. The large influx

of refugees in West Nile has put a strain on local resources but also on the provision of food assistance. An estimated 25 per cent of refugee households in West Nile rely on the sale of food assistance as their main source of income (FAO, 2018).

Both refugee and host communities' households reported natural resource-related issues as the most significant shocks to their livelihoods, in particular drought, flooding, water logging, storm, water shortages as well as pests and diseases (see figure 9). These climate and environmental pressures directly affect food and livelihood security in West Nile (DRC et al., 2018).
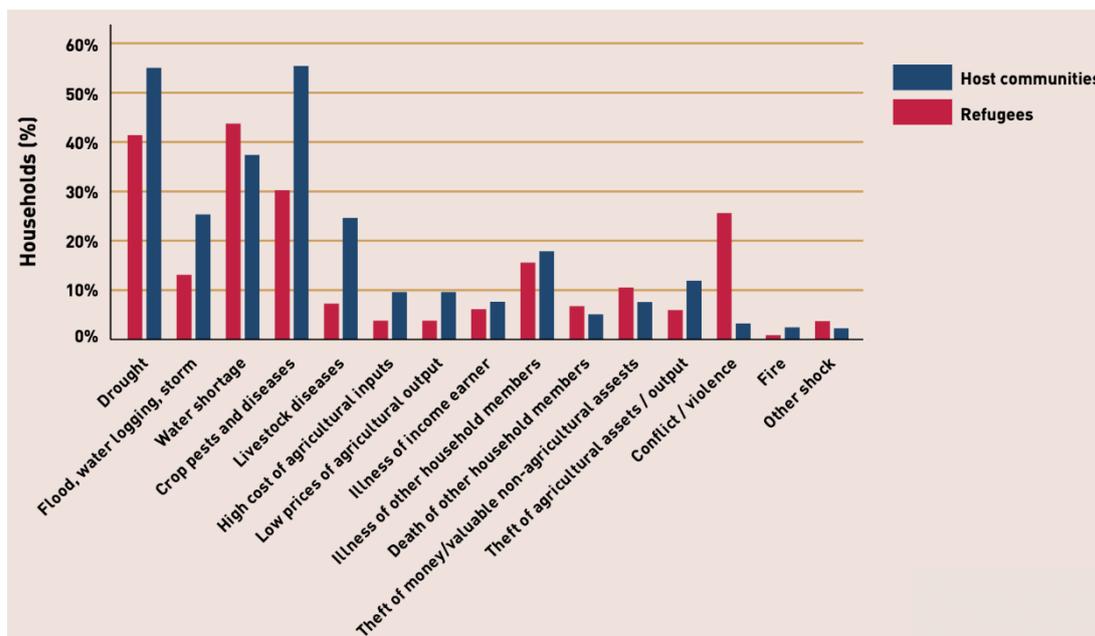

Figure 9: Percentage of refugee and host communities' households reporting shocks (FAO, 2018)

Intersectional vulnerabilities

Several factors shape people's vulnerability to climate-related security risks and their adaptive capacity. Socio-demographic groups that are generally considered as more vulnerable to climate shocks include women, youth, elderly people, disabled persons, and refugees and IDPs. Neither the impacts of climate insecurity nor capacities to adapt are distributed evenly among these population groups (Nagarajan et al., 2022). People with low socio-economic status, as well as those living in rural areas and highly dependent on weather patterns and natural resources, are generally considered as amongst the most vulnerable (Smith, 2022).

Inequality can be a key cause but also a consequence of climate insecurity. Certain groups, especially women, are blocked from undertaking strategies used by others to adjust to changing dynamics. As a result, the combined impacts of climate change and existing vulnerabilities widen already existing inequalities, with layers of exclusion often overlapping. Climate insecurity can also increase levels of gender-based violence (Nagarajan et al., 2022).

Intersectional vulnerabilities depend on existing societal inequalities, the exposure to climate shocks and people's adaptive capacity. As for gender-related issues, the Constitution of Uganda provides the foundational legal framework for gender equality and guarantees 'the right to equal treatment of women and men', including provision of

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equal opportunities in all spheres of life (Uganda Parliament, 1995). In line with this framework, the government has signed several international and regional instruments that support provisions for women's rights to protection, access to care services and resources.[5] Despite progress made at the enabling and institutional level, customary gender practices and relations often supersede civil laws, especially in rural areas such as the West Nile sub-region. Patriarchal customary beliefs and practices, which often harm women, are sustained by exclusionary cultural systems and weak enforcement of civil laws (WFP, April 2022).

Ugandese women continue to have limited access and control over productive resources and have limited opportunities to participate in community and development programmes (WFP, April 2022). Involvement of women in decision-making at the household and community level is generally low and, despite the lack of precise statistics, Gender-Based Violence (GBV) is considered to remain common (UN-Habitat, 2019). In 2021, Uganda ranked 66th out of 144 countries on the Global Gender Gap and ranked 98th and 60th on education attainment and health and survival, respectively (World Economic Forum, 2021).

Women in West Nile are a key part of the productive workforce providing more than 80 per cent of labour in the agricultural sector (WFP, April 2022). Both amongst the host population and refugees in West Nile, socioeconomic development and livelihood security are deeply intertwined with gender roles and relations. In many farming households, women are responsible for land preparation, planting, weeding and post-harvest activities of drying, processing and preparation. Additionally, women take care of off-farm household tasks such as cooking, cleaning, caring for children, caring for the sick, collecting firewood and fetching water (Bamanyaki, 2020; Mkutu, 2008). While women take up the bulk of agricultural activities, men may be active in cultivation of cash crops or pastoralism. Nonetheless, as the most common heads of households, men usually own and control all the natural, physical and a significant share of financial assets. Women rely on men to access production resources which limits their involvement in economic development activities. Widows and women that cannot bear children have limited social security and are often unable to access their late husbands' or parents' assets (WFP, April 2022).

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[5] These include the National Development Plan III and Uganda's Vision 2040.

The World Food Programme (WFP) in West Nile

The primary focus for WFP in West Nile has been crisis response via in-kind and cash-based general food assistance for refugees. To implement WFP programmes, the area office of Arua works through two field offices. One, in Koboko District, covers Bidibidi, Rhino Camp, Imvepi, Palorinya and Lobule refugee settlements. The other, in Gulu District, covers Adjumani, Palabek and Kiryandongo refugee settlements (WFP, May 2022).

WFP provides refugee households in West Nile the option to choose either in-kind food assistance or cash-based assistance. In May 2022, about 63 per cent of refugees opted for in-kind food assistance, while 37 per cent of households preferred cash-based assistance (WFP, May 2022). In addition to food and cash-based assistance, WFP works on strengthening social protection by improving community and household resilience among refugees and host populations. The Child-Sensitive Social Protection Programme (CSSP) includes cash-transfers for better nutrition, Social and Behavioural Change Communication (SBCC), market linkages, active case finding and referral, first with 'Emergency Cash-Based Transfers' (ECBT) during the COVID-19 lockdown of 2020 and 2021, and currently with longer-term 'NutriCash' transfers (WFP, May 2022).

WFP's Agriculture and Market Support programme contributes to building the resilience of smallholder farmers, especially women, refugees, and youth, for better livelihood outcomes. Interventions ensure that smallholder farmers, micro and small agricultural enterprise owners acquire the knowledge and skills to benefit from economic participation in agri-food systems, to achieve food security, improved nutrition, and resilience to shocks. Smallholder resilience-building contributes to Uganda's aspiration of the National Development Plan III (NDPIII) for inclusive agriculture-led growth and the United Nations collaboration framework's ambition for Ugandans to achieve shared prosperity in a healthy environment (WFP, May 2022).

WFP also supports supply chains in West Nile by facilitating food handling and storage, transportation, retail, access to markets, food safety and quality control, and bilateral services provision to the wider humanitarian community in the region. WFP has taken on Market Facilitation and is currently developing a comprehensive and inclusive strategy for the Uganda Country Office. The programmes will complement each other as far as market facilitation is concerned. Market Facilitation ensures a direct linkage between WFP's cash-based transfer activities and smallholders producing and adding value to value chains like cassava maize and groundnuts. Market Facilitation targets both refugees and host community members and is primarily implemented through cooperating partners in refugee hosting and impact districts in West Nile (WFP, May 2022).

WFP has worked towards making refugees self-reliant by gradually moving the most resilient households off the programme, but it has become evident that those receiving lower rations or who have stopped receiving food assistance are still far from self-reliant and face difficulties to subsist without support. Therefore, WFP sees a critical need to rethink beneficiary selection for food assistance as well as the relief system more broadly (WFP, January 2020).

Climate and environment

This chapter provides an overview of historic trends and projected changes in climate parameters, and related impacts on different key sectors for 2030, 2050 and until 2080, taking different climate change emission scenarios into account. It is important to note that, due to challenges in obtaining fine-grained analysis at the very local level, most climate data and projections in this section focus at the national level, rather than on the West Nile sub-region.

Key climate and environmental trends and projections

Historic and current trends (source: World Bank, Climate Change Knowledge Portal)

Temperature
- Average temperature in Uganda has increased by 1.3°C since the 1960s.
- Notably, minimum temperatures have increased 0.5 - 1.2°C for this period with maximum temperatures increasingly by 0.6 – 0.9°C.
- Increased average temperatures have been observed at 0.28°C per decade since 1960.
- Daily temperature observations since 1960 show significantly increasing trends in the frequency of the number of hot days, and much larger increased trends in the frequency of hot nights.

Precipitation
- Precipitation for the country is highly variable, but overall, Uganda has experienced a statistically significant reduction in annual as well as seasonal rainfall.
- Seasonal rainfall for March - May has been most affected, with decreases of 6.0 mm per month, per decade.
- Droughts have increased in Uganda over the past 60 years. Specifically, over the past 20 years, western, northern and north-eastern regions have experienced more frequent and longer-lasting drought conditions.

Climate projections (source: Potsdam Institute for Climate Impact Research (PIK))

- Depending on the scenario, temperature in Uganda is projected to rise by between 1.5 and 3.5 °C by 2080, compared to pre-industrial levels, with higher temperatures and more temperature extremes projected for the east and north of the country, including the West Nile sub-region.
- The population affected by at least one heatwave per year is projected to rise from 0.2 per cent in 2000 to 9.5 per cent in 2080. This is related to 39 more very hot days per year over this period. As a consequence, heat-related mortality is estimated to increase by a factor of four by 2080. The Northern Region, including West Nile, is expected to experience the highest increase in heatwaves.
- Precipitation trends are highly uncertain and projected to increase by 2080. Future dry and wet periods are likely to become more extreme. West Nile is considered at high-risk for both river and urban floods.
- Per capita water availability will decline by 2080 mostly due to population growth. Model projections indicate that water saving measures will become particularly important after 2050 all over Uganda.

- Models project a possibility of an increase in crop land exposure to drought. Yields of maize, millet and sorghum are projected to decline, while yields of less sensitive crops such as groundnuts are projected to increase under higher emissions scenarios.

Table 2: Key climate and environmental trends and projections (source: PIK and World Bank)

Historic Trends

Average temperatures in Uganda have increased significantly since the 1960s, with an estimated 1.3°C. Observations also indicate significant increasing trends in the occurrence of hot days and hot nights, as well as a decrease in the number of cold days and nights (UMWE, 2015; McSweeney et al., 2010).[6]

Over the past 60 years there appear to be no major changes in annual rainfall trends across Uganda, except for some modest decline in north-central and north-eastern Uganda. However, there is a significant discernible trend in the changes in heavy rainfall events with a rise in the frequency and length of droughts in western, northern and north-eastern regions (Zinyengere, 2016).

Climate projections

Temperature

All scenarios (from low emissions in line with the Paris agreement to medium or high emissions[7]) project a rise in temperature in Uganda (and the broader East African region) by 2080 compared to pre-industrial levels, ranging from 1.5°C to 3.5°C. Especially the northern and eastern regions of Uganda will experience the most extreme rise in temperatures. Similarly, the number of hot days (daily maximum temperature above 35 °C) per year will also rise throughout the country, especially in northern Uganda (see figure 10) (Tomalka, 2021). According to the World Bank, these increased temperatures will also impact increased aridity and the length and severity of the dry season (MacKenzie, 2020).

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[6] Hot days and nights are defined as the number of days/nights in which the temperature exceeded 10 per cent of days/nights in the current climate of the region and season. Cold days or cold nights are defined as the temperature below which 10 per cent of days or nights are recorded in the current climate of that region or season.

[7] Representative Concentration Pathway (RCP) is a greenhouse gas (GHG) concentration (not emissions) trajectory adopted by the Intergovernmental Panel on Climate Change (IPCC). RCP2.6 requires that emissions start declining by 2020 and go to zero by 2100. In RCP6.0, emissions peak around 2080, then decline. RCP 2.6 is therefore considered as more optimistic compared to RCP 6.0.
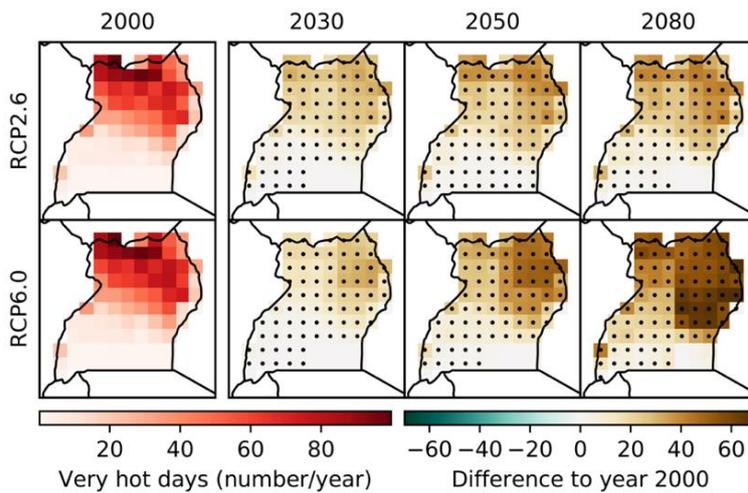
Figure 10: Projections of the annual number of very hot days (daily maximum temperature above 35 °C) for Uganda for different GHG emissions scenarios (source: PIK)

Precipitation and soil moisture

While climate models are less certain about projected precipitation levels, the number of days with heavy precipitation events is expected to increase, at least under higher emissions scenarios. Under high emissions scenarios, models project an increase in the number of days with heavy precipitation from 8 in the year 2000 to 10 in the year 2080. Under low emissions scenarios, the number of days with heavy precipitation is projected to remain the same (see figure 11). Due to this uncertainty, it is difficult to differentiate precipitation per region (Tomalka, 2021). However, some models project changes in seasonality, with an increase in rainfall during the dry season. This could have strong impacts on agriculture, especially for certain tree crops and for post-harvest activities such as drying and storage (Caffrey et al. 2013). According to the World Bank, the greatest change in the intensity and frequency of extreme rainfall events is likely to take place between the current and the mid-century period in this region, which would impact major agriculture and livestock zones and transportation routes (MacKenzie, 2020).
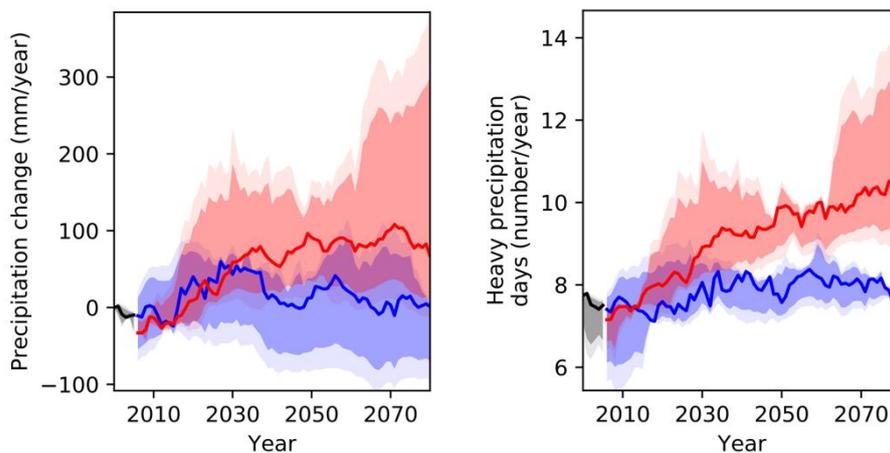

Figure 11: Projections of precipitation in Uganda for low emissions scenario, (RCP2.6, blue) and high emissions scenario (RCP6.0, red). (source: PIK)

Precipitation and evapotranspiration are two key factors that influence soil moisture, which is an important indicator for drought conditions. Evapotranspiration is the

amount of water that would be evaporated and transpired if sufficient water was available at and below the land surface. Higher temperatures translate into higher potential evapotranspiration. Consequently, hydrological projections in Uganda indicate a stronger and more continuous rise of potential evapotranspiration as temperatures rise (see figure 12). However, soil moisture projections for Uganda show considerable modelling uncertainty as different hydrological models project different directions of change (Tomalka, 2021). The combination of drying soil and heavy rain events could see an increase in runoff, which is expected to affect the Upper Nile Basin Region (Zinyengere et al., 2016).
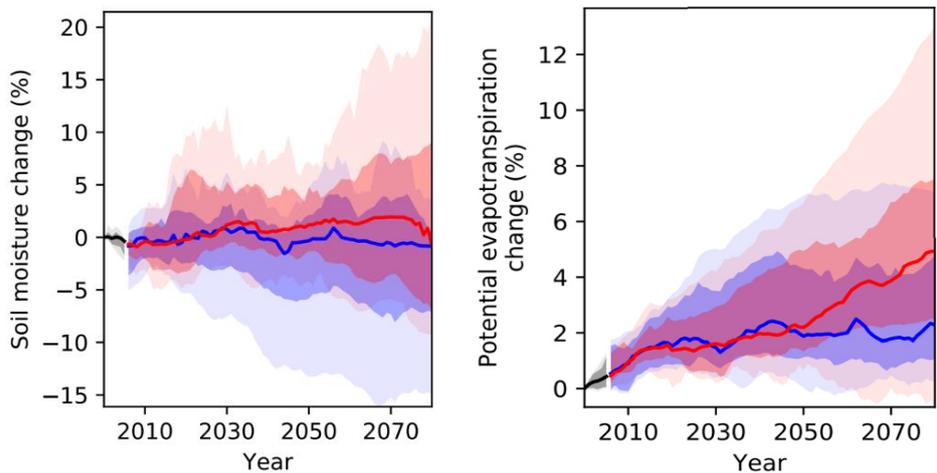
Figure 12: Soil moister change and potential evapotranspiration for Uganda for Uganda for low emissions scenario, (RCP2.6, blue) and high emissions scenario (RCP6.0, red). (source: PIK)

Extreme weather events and natural disasters

Uganda has seen an increase in the frequency and severity of extreme weather events, such as droughts, storms, flooding, and landslides. In the past decades, the number of people in Uganda affected by natural hazards has increased significantly (see figure 13).
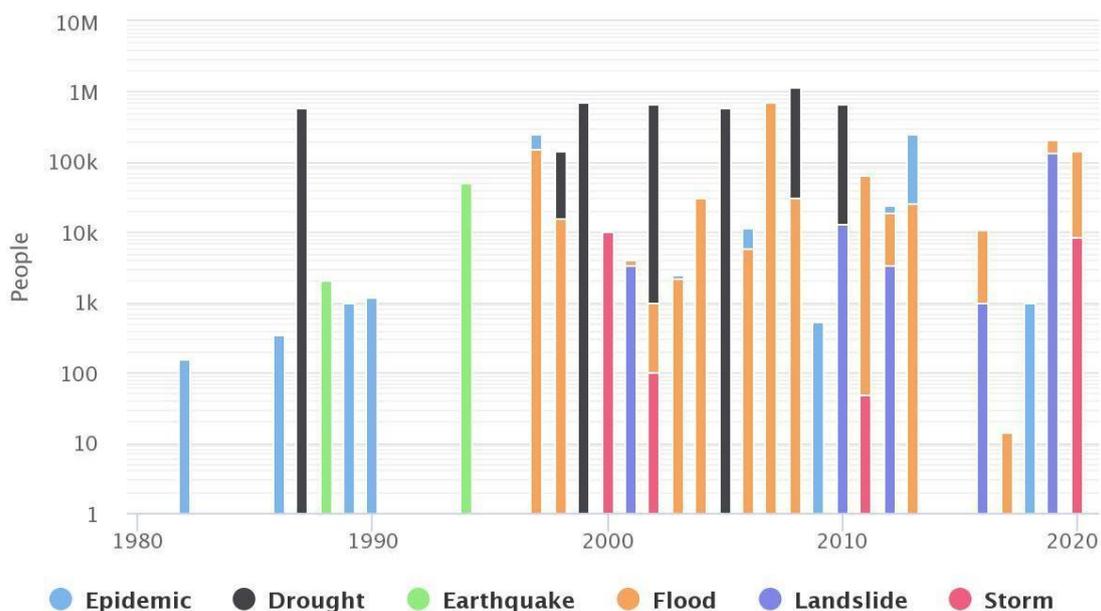
Figure 13: Number of people affected in Uganda by natural hazards (1980-2020) (source: World Bank)

Droughts have become more frequent and longer. In the future, the intensity and frequency of extreme rainfall events are expected to continue to increase in most parts of Uganda. In combination with an expected increase in heatwaves and extended periods of drought, this will lead to an increased risk in flooding, especially in river basins such as the Albert Nile (see figure 14) (MacKenzie, 2020).
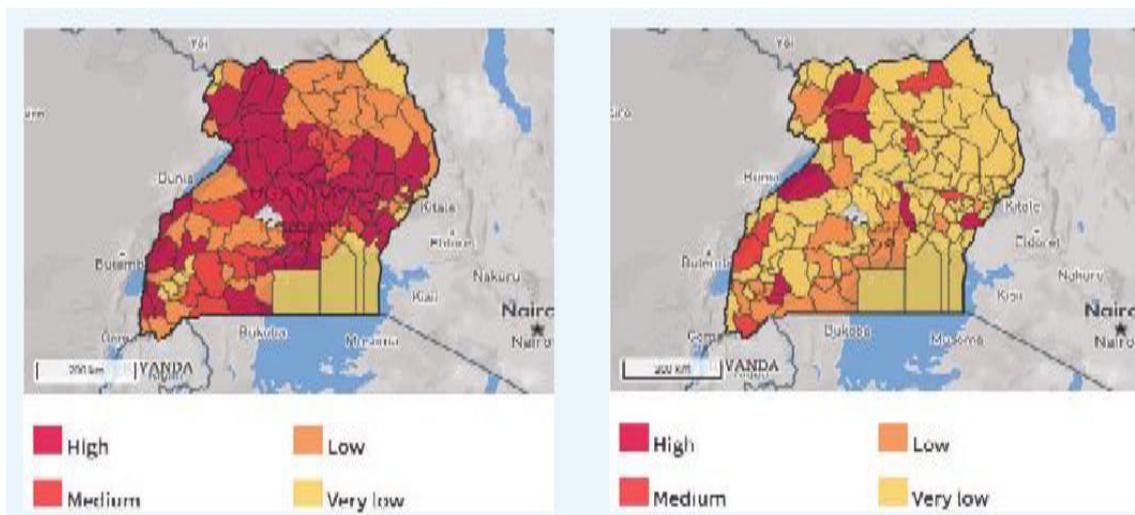
Figure 14: Uganda river flood risk (left) and urban flood risk (right) (source: ThinkHazard!, 2020)

Climate change impacts to key sectors

Climate change is already impacting different sectors in Uganda's West Nile sub-region, which is projected to further intensify in the future. Some of the most vulnerable sectors in West Nile include agriculture, health, water resources, forests, energy and infrastructure, which are all closely interlinked with livelihood security and food systems.

| Sector	Projected impact	Mechanism
Agriculture	Flooding	Increased intense rainfall events and possibly higher rainfall will increase risk of flooding, loss of life, property and infrastructure.
	Water scarcity	Higher temperatures, with more variability in rainfall may lead to drought stress, higher demands for water, conflict, and biodiversity loss.
Water	Change in crop yields	More intense rainfall, soil erosion, high temperatures, and droughts could cause loss in yields; changes in average rainfall may increase or decrease yields.
	Livestock changes	Increased droughts could cause losses in livestock; increased rainfall could expand areas suitable for livestock.
	Fisheries	High temperatures and changes in water levels can cause reduced spawning.

Health	Water borne diseases	Diseases such as diarrhoea and cholera are likely to increase with increased rainfall intensity and flooding, largely affecting areas with poor sanitation.
	Malnutrition	Reduced food options from low rainfall, high temperatures, and extreme events associated with food crop losses will result in malnutrition and famine.
	Vector borne diseases	Higher temperatures may result in an extension of vector borne diseases such as malaria.
Energy	Biomass loss	Increased temperatures will increase the risk of forest fires; reduced livelihood options will exert more pressure on forest products.
	Hydro capacity	Reduced rainfall would lead to changes in lake levels and river flows.
Infrastructure	Transport	Road networks are vital for livelihood security but generally in poor condition, especially in rural areas, where they lack resilience to flooding, landslides or other climate-related impacts.
	Human settlements	Refugee settlements and infrastructure in rural areas are particularly vulnerable to extreme weather events due to poor quality and resilience.

Table 3: Overview of impacts of climate change on various sectors in Uganda's West Nile sub-region (source: Future Climate for Africa; PIK; World Bank)

Agriculture

Subsistence farming is the main form of agriculture in West Nile and crops are predominantly rainfed, and thus highly depend on the amount of precipitation and the degree of evapotranspiration. Irrigation facilities and practices remain poorly developed throughout the West Nile sub-region, so human-influenced agricultural resilience mechanisms are lacking. As the length and intensity of precipitation becomes more and more unpredictable due to climate change, agriculture in West Nile is highly vulnerable to drought exposure. Figure 15 provides an overview of crop sensitivity to climate change for some of the main crops grown in Uganda and the West Nile sub-region. For instance, rising temperatures and erratic rainfall increase the risk of disease and pest infestations in coffee. Two major rice diseases (blast and bacterial leaf blight) affect rice yields and are significantly aggravated by weather conditions such as higher temperatures, air humidity, or soil moisture (Caffrey et al., 2013).
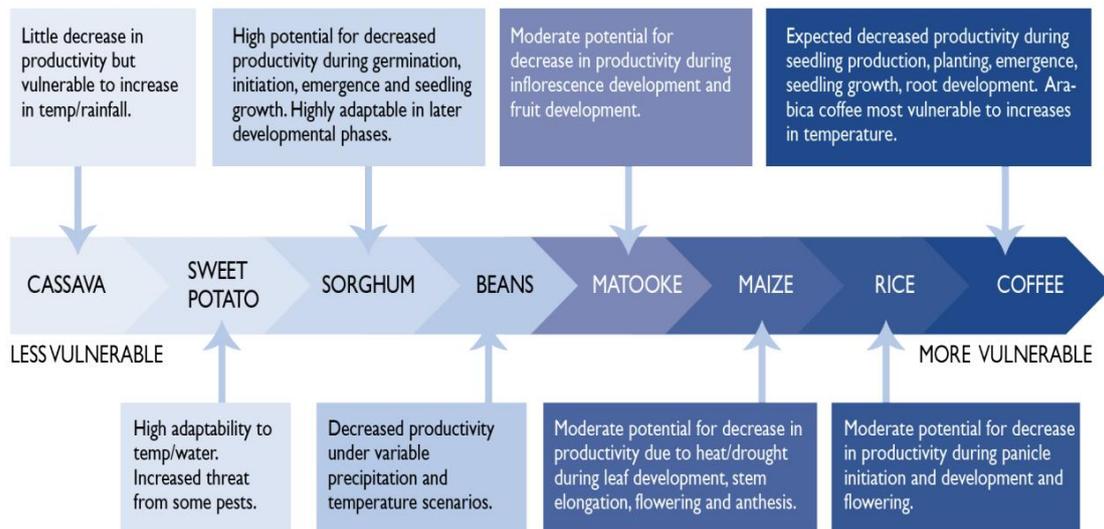
Figure 15: Phenological climate Change Vulnerability Continuum of Selected Crops (source: Caffrey et al., 2013)

Even though crops like millet and sorghum are more tolerant to hot temperatures and drought as compared to maize, climate change is expected to have a negative yield trend for all three crops. Yield projections for groundnuts and cassava are less certain and depend on the scenario (see figure 16) (Tomalka, 2021).[8]
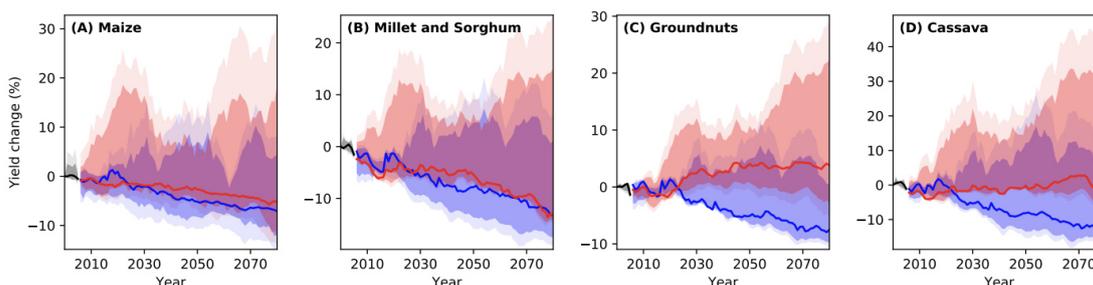
Figure 16: Projections of crop yield changes for major staple crops in Uganda for for low emissions scenario, (RCP2.6, blue) and high emissions scenario (RCP6.0, red), assuming constant land use and agricultural management

According to the World Bank, increased drought and unpredictable seasonality may increase soil erosion, reduce soil fertility and shorten growing seasons in north-western Uganda, leading to growing difficulties for many crops and reduced crop yields. Climate change could thus see a reduction in the production of food crops such as cassava, maize, millet and groundnuts by the 2050s (MacKenzie, 2020). Similarly, the Ugandan Ministry for Water and Environment expects the soil for the West Nile sub-region to become almost entirely unsuitable for coffee production by mid-century. Rising temperatures may also increase the risk for crop diseases and pest infestations, and erratic rainfall could affect the drying process and storage of crops. (UMWE, 2015). In addition, the projected increase in the number of very hot days in West Nile and the broader northern regions of Uganda could make livestock vulnerable to heat stress, which has a variety of detrimental effects on animal health and productivity. Increase in temperatures and the reduction in soil moisture may also make some grazing lands unsuitable for livestock rearing (MacKenzie, 2020). Similarly, fishing provides a source

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[8] For a more detailed overview of climate-related vulnerability comparison by crop, see annex 1 of this report.

of livelihood for about 1.2 million people in Uganda, employing an estimated 8 per cent of the total labour force. The effects of climate change are expected to stress fisheries, resulting in disrupted livelihoods and significant economic losses (Zinyengere et al., 2016).

Water availability

Future water availability is highly dependent on projected population change, as population growth comes with an increased demand. Uganda has an estimated population of 48 million with an annual demographic growth rate estimated around 3 per cent. Based on current projections, the country's population is expected to surpass 100 million people by 2050 and reach 167 million people by the end of the century (WPR, 2022). When accounting for moderate[9] projections for population growth, per capita water availability for Uganda is expected to decline by 80 per cent by 2080 relative to the year 2000 (Tomalka, 2021). This decline would be primarily caused by demographic pressures, but changes in precipitation and the frequency and length of droughts will further reduce water availability. While there is strong modelling uncertainty on projected water availability from precipitation, climate change is likely to impact Uganda's water resources through variability in precipitation, rising temperatures and drought (Tomalka, 2021). An in-depth assessment of water availability in Uganda anticipated the largest overall economic losses due to water stress to be in the Lake Victoria, Albert Nile and Lake Kyoga watersheds (Taylor et al., 2014).

Health

An increased frequency in heatwaves, floods, landslides, droughts and storms can also threaten the health and sanitation sectors, with detrimental effects on food systems and nutrition. With an increase in exposure to heatwaves, heat-related mortality, especially amongst elders, is expected to increase (Tomalka, 2021). Uganda is generally prone to climate-sensitive diseases such as malaria, cholera, and dysentery. The risk of vector-borne diseases is likely to increase with climate change and population growth. Water-borne diseases are expected to affect more people when increased flooding around rivers and lakes takes place (MacKenzie, 2020).

Energy

The energy sector in Uganda comprises petroleum, hydroelectric power, biomass, and some renewable energy sources. The vast majority of energy demand and supply in West Nile comes from traditional biomass sources such as firewood and charcoal. There is already a serious deficit in demand and supply, and this is expected to worsen in the future if forests continue to decline (Zinyengere et al., 2016).

Hydropower contributes the largest source of installed electricity capacity in Uganda, but this is very sensitive to water availability. Variability in precipitation, lowering of lake levels, reduced river flows and flooding will severely affect hydropower generation. In combination with expected demographic pressures, electricity supply could become more disrupted in the future (MacKenzie, 2020; Tomalka, 2021).

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[9] This is by following the second Shared Socio-economic Pathway (SSP), which represents the "middle of the road" pathway. Five different SSPs outline future realities according to a combination of high and low future socio-economic challenges for mitigation and adaptation.

Infrastructure

Climate change is expected to significantly affect Uganda's infrastructure sector through extreme weather events, such as flooding and droughts. Transport is highly dependent on the road network, which accounts for about 90 per cent of passenger and freight traffic. High precipitation rates and temperatures can severely damage transport infrastructure, with direct impacts on social, economic and agricultural livelihoods. Roads in rural areas, including in West Nile, are already in poor condition and limit accessibility, especially in the rainy season. This is expected to worsen with the impact of climate change. In addition, informal human settlements such as refugee camps and dwellings in rural areas are highly vulnerable to extreme weather. With a large refugee population present in West Nile, infrastructure in this region could become particularly vulnerable (Tomalka, 2021).

Climate insecurity pathways: how climate security risks affect food systems, peace and security

This section will lay out some of the pathways – or cascading effects – through which climate change and environmental pressures can compound risks to peace and security. Based on these climate insecurity pathways, the following chapter will identify some of the key risks and drivers of conflict in West Nile.

There is ample evidence that climate stressors and environmental pressures have contributed to food insecurity and violent conflict, and this is expected to increase as the impacts of climate change worsen. Evidence also suggests that climate-related conflict is more likely to emerge in regions highly vulnerable to climate variability and with low socio-economic development, poor infrastructure and state capacity, and high levels of food insecurity, poverty, socio-political inequality, and dependency on agriculture. Most of the regions that experience protracted crisis or high risk of famine are often simultaneously affected by violent conflict and scarcity in natural resources, which reflects the interconnection between climate, food systems, environment, climate, and insecurity (Liebig et al., 2022; Rüttinger et al., 2015).

It is important to distinguish the broader effects of climate change from more direct and localised human-made environmental pressures. The latter could result from, for instance, deforestation, pollution, or unsustainable agricultural practices. While these can rapidly lead to environmental degradation, they are often compounded by the effects of extreme weather events and climate change. Taken together, both environmental pressures and climate change lead to degradation of ecosystems and natural resources scarcity. In contexts where livelihoods are highly dependent on natural resources, such as forestry or rain-fed agriculture, this could rapidly lead to livelihood and food insecurity.
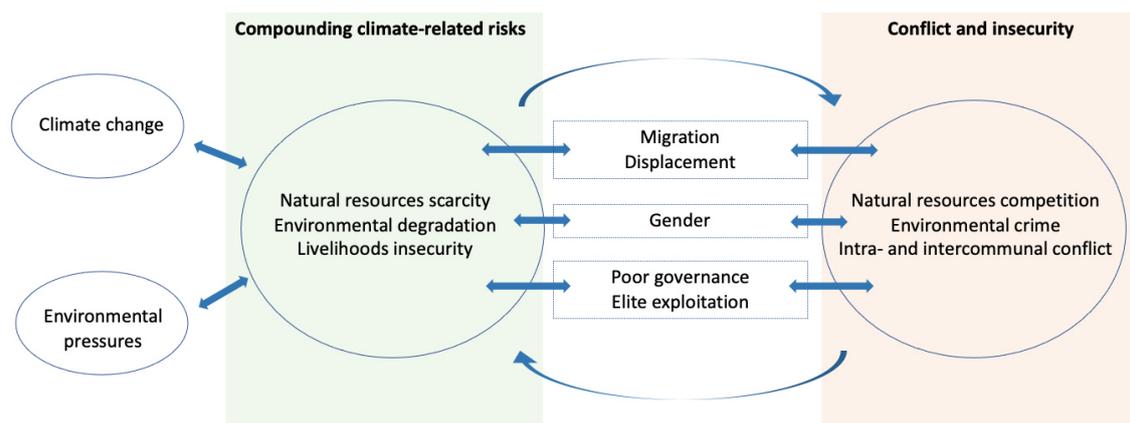
Figure 17: Climate insecurity pathways (source: adelphi, Weathering Risk)

Figure 17 illustrates the pathways how natural resource scarcity could contribute to intensified competition, which can escalate into violent conflict, especially when law enforcement and other governance structures are weak or absent. Competition over natural resources usually first plays out between communities (e.g. between ethnic or political groups, or between refugees and host communities) and potentially also within communities (i.e. between households). Conflict and insecurity can also lay the way for an increase in environmental crimes (e.g. illegal logging, poaching, trafficking of natural

resources, etc.), which can then lead to further environmental degradation. Similarly, climate pressures are known to create conditions that are conducive to the growth of armed groups. When local grievances and issues are not addressed, young men and women become more vulnerable to armed group recruitment and environmental crime (Caus and O'Neil, 2021; Tschunkert et al., 2021).

Violent conflict has severe consequences on food systems and food security, including on the production of food, as well as marketing and distribution (Tschunkert et al., 2021). Conflict over natural resources can thus lead to a vicious cycle, as insecurity worsens access to and availability of natural resources, leading to further scarcity and environmental degradation. This can take place in different forms: farmers may no longer be able to work their land and secure their harvest; women and girls may no longer collect water or firewood out of fear for sexual and gender-based violence (SGBV); local business owners might close shop out of fears for pillaging or robbery; traders no longer work in areas controlled by armed groups due to illegal road taxation and insecurity.

It is important to note that the cascading effects of climate on peace and security are highly complex, and usually first play out at the local and communal level. Multiple moving parts influence each other: there can be linear, causal linkages between climate and insecurity, but these are also shaped by indirect, intermediate factors and context-specific dynamics (Liebig et al., 2022). Although there are some general trends and patterns to discern through climate insecurity pathways, the change processes always remain difficult to apprehend or predict.

Climate, peace and security in West Nile

The West Nile sub-region has been peaceful and stable in recent years, despite its long experience with armed insurgencies in the past, including most notably the violent and terrorising presence of the Lord's Resistance Army (LRA) between 1987 and 2006. Uganda's history of political power struggles has left a legacy of violence against civilians and displacement, which has mostly affected the northern regions. Since its independence, Ugandan leaders have systematically exploited deeply rooted divisions between north and south, leading to marginalisation and underdevelopment of the northern regions. Local resentment and power vacuums have been exploited by several armed groups, causing renewed and continuous cycles of violence (Lomo and Hovil, 2004; Sample, 2021).[10] Up until today, grievances of communities in West Nile remain largely unaddressed, lacking mechanisms in place for transitional justice, post-conflict reconciliation and compensation for victims and ex-combatants (Herbert and Idris, 2018; World Vision, 2017, 2018).

While political and socioeconomic resentment exist amongst the local population, the key risk of conflict in West Nile today relates to livelihood and food security, as well as the closely related competition over natural resources. This has been a rising concern since the influx of South Sudanese refugees in 2016, which put a strain on existing forestry and agricultural resources.[11] Tensions over natural resources therefore mostly materialise between host communities and refugees. Despite generally positive and inclusive relations between both sides, access to firewood, land and water resources has triggered hostility due to scarcity (DRC et al., 2018).

The following section identifies four main climate-related risks and drivers of conflict in West Nile that affect food systems and security.

Conflict over forestry and water resources

The vast majority of refugee and host population households in West Nile rely on wood as cooking fuel. While most local communities use charcoal for cooking, the much poorer refugee population primarily relies on firewood directly collected from surrounding forestry sources (International Alert, 2013; UN-Habitat, 2021). Due to unsustainable forestry management and the spike in demand since the influx of refugees in recent years, trees are being cut down at an unsustainable rate, especially in and around refugee settlements (DRC et al., 2018).

Firewood is traditionally collected by women and girls, a process that became more difficult and time-consuming as forestry resources in the region drastically declined. During interviews and focus group discussions in West Nile, participants not only explained the collection of firewood as a critical supply issue, but also as a security concern more broadly. When women and girls venture further away from refugee settlements to collect firewood in lands owned by host communities, they are exposed to security risks such as harassment and SGBV. Local communities, for whom forestry has also become a scarce resource, are often unwilling to allow refugees to collect

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[10] One of the most significant armed groups active in West Nile was the Lord's Resistance Army (LRA), founded in 1987 by Joseph Kony during the Ugandan civil war. The extremist group also targeted civilians in the wider region, including in the DRC, the Central African Republic (CAR) and South Sudan.

[11] For example, the Yumbe district experienced an increase in population of roughly 50 per cent in the last five years.

firewood on their lands. In addition, the time-consuming process of collecting firewood also prevents women and girls from undertaking other activities, such as agriculture, household tasks, education or leisure. Female-headed households are of particular risk (Logie et al. 2021).

In addition, the expansion of agriculture, especially cash crop activities, significantly drives deforestation in north-eastern Uganda (FAO, 2021). Uganda's government has long prioritised agriculture land over forestry resources. Changes in the land classification system used by Ugandan authorities show how there have been immense losses of forest land in West Nile in the past 20 years, with gains for land classified for agriculture and grassland (see figure 18). The systematic conversion from natural landscapes to more human-influenced land-use types imply an unsustainable rate of intensive deforestation in West Nile (UN-Habitat, 2021).
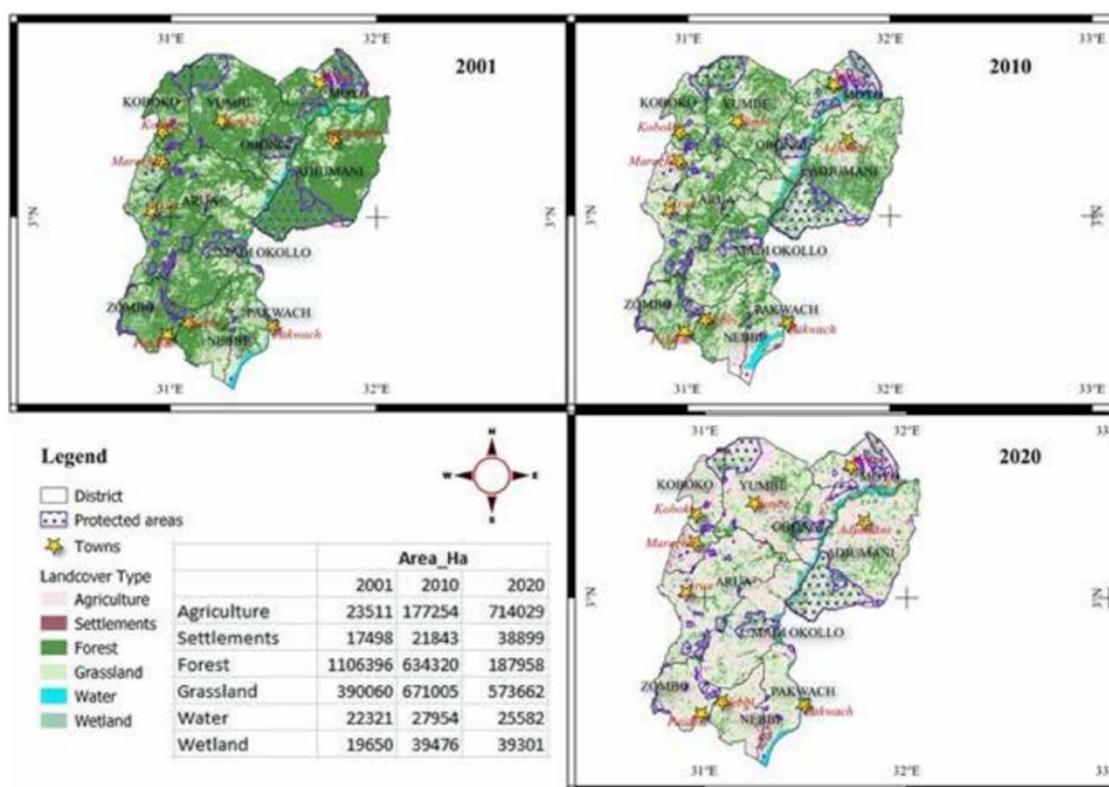
Figure 18: Land use classification by the Ugandan government for West Nile (2001-2020) (source: UN-Habitat, 2021)

In addition to firewood collection and logging, the burning of forest and grassland areas as hunting practice has put additional pressures on the tree cover. Loss of tree cover contributes to environmental degradation, with cumulative effects such as a decrease in soil fertility, higher flood vulnerability, silting of waterways and degrading water quality (AAH, 2017). With precipitation becoming more uncertain and variable, West Nile is already facing seasonal water stress. Poor crop yields are often associated with extended hot and dry periods, which are projected to become more frequent despite a potential overall increase in precipitation. Water scarcity in West Nile will be exacerbated because of its dependence on rain fed subsistence agriculture and poor infrastructure (Coffel et al., 2019). While conflicts over access and availability of water in West Nile are rare, interviewees in West Nile provided some anecdotal evidence of communal competition and conflicts over water points and natural springs. A further

decrease in water availability will directly impact people's livelihoods and food security, leading to more competition and enhanced risks of conflict in the region.

Conflict over land

Another risk of conflict in West Nile includes land use and management, especially for agriculture. Land is an important but sensitive resource, essential for cultural identity and for sustaining livelihoods and the local food basket. Land ownership in West Nile also has a complicated history, marred by conflict and political interference. While the Ugandan authorities have attempted to implement legal frameworks for land ownership, most land in rural areas in West Nile is governed through customary law and traditional chiefdoms (UN-Habitat, 2021).

Since the influx of South Sudanese refugees, the Ugandan authorities negotiated with local community leaders to acquire land for usage by refugees. In some cases, the allocation of portions of land to refugees caused resentment amongst the local population, as much of the land is considered communal land managed through customary laws. Traditional land chiefs see this as a lack of appreciation from the government for land that was promised or perceived to belong to their communities (UN-Habitat, 2021). Refugees, on the other hand, expressed concerns about sharing the land with the host population out of fear of hostility. In addition, refugees reported that most of the land they received was unfertile and impossible to cultivate or too far from their home base (DRC et al., 2018).

It should be noted that host communities in West Nile have generally been exceptionally welcoming towards refugees in the past years, including in terms of land sharing and integration in local structures. For instance, local subsistence farmers often allow refugees to make use of some part of their land for agricultural production. In return they would request a commission, either in cash or in food as part of the produced crops. Such informal agreements have in many cases worked well. However, in some reported cases, individual conflicts did occur, especially over harvest-related profits or in cases when harvest would fail.

As subsistence farming in West Nile is entirely rain-fed, it remains extremely vulnerable to covariate shocks in the form of adverse weather events related to climate change and variability. Droughts in West Nile have already resulted in scarcities in local food markets and inflated the prices of food staples such as maize, vegetables, beans, potatoes, cassava and cabbage. Even people with access to fertile lands have faced severe problems to secure their livelihoods in the past years (WFP, January 2020). While the scale of conflict-induced internal displacement has decreased significantly over the years throughout Uganda, around 1.000 people were displaced in 2020 due to conflict over land and water (IDMC, 2021). As precipitation is expected to become more uncertain and variable in the future, and overall water availability will decline due to demographic pressures and climate change, conflicts over farming land in West Nile may become more severe in the future.

Conflict over access to aid

Access to aid and development resources – including food distributions - available to refugees in West Nile has been a major point of contestation amongst host communities. In general, refugees have a shared interest that the host population also benefits from these resources, as they depend on their goodwill to be accepted.

However, as host communities usually have a larger asset base and social network on which they can build some resilience to climate shocks, they often don't have access to governmental or humanitarian support when their livelihoods come under severe pressure. This could feed resentment towards refugees and the existing support structures, causing tensions and potentially driving localised conflicts (DRC et al., 2018). When local resources get scarcer, this could increase competition and resentment over aid relief, during which the host community could perceive themselves as unfair losers of the refugee presence. For example, when droughts affect the harvest, most of the registered refugees can fall back on food assistance as a primary support mechanism, while this is more difficult for host communities.

WFP has long tried to make refugees and vulnerable populations in West Nile self-reliant in terms of food security. However, due to poor access to cultivable land, local markets and income opportunities, many refugees remain heavily dependent on food assistance, discouraging them from moving out of settlements and thereby undermining the self-reliance agenda (WFP, January 2020). Overall, despite differences in coping mechanisms, both refugees and host communities in West Nile are highly vulnerable to climate change and related shocks. One study even found that refugee households perceive themselves to be more resilient to climate impacts, with host communities reporting lower levels of perceived resilience (FAO, 2018).

Migration and displacement as conflict risks

Migration in response to environmental pressures has a long history, and mobility can be a successful and peaceful means of climate adaptation. The decision to move is a form of risk management employed by people to diversify incomes and reduce household vulnerability (Null and Herzer Risi, 2016). Climate-induced mobility could include moving away ("out-migration") from less viable areas with lower water availability and crop productivity and towards ("in-migration") areas with better options to secure livelihoods and pursue socioeconomic opportunities. However, climate change is never the sole factor prompting people to move. Migration is always multi-causal. The decision to move is often taken based on expectations around the social, economic and political situation (Akinro et al., 2008; Hassan et al., 2020). The emergence of hotspots of climate in- and out-migration can have major implications for climate-sensitive sectors and for the adequacy of infrastructure and social support systems in both rural and urban areas (World Back, 2018).

Uganda could exhibit high levels of internal migration and displacement as a consequence of slow-onset climate impacts, including water stress and drops in crop and ecosystem productivity. Internal migration is not a new phenomenon in Uganda. It has long been used as a risk management strategy, but climate change is likely to amplify historical mobility patterns (Rigaud et al. 2021). In Karamoja, for instance, herders often migrate during times of difficulty to find fresh pastures and water for livestock, or opportunities for employment through casual labour (WFP, 2017). The risk of conflict emerges when new arrivals' need for land — both for agriculture and grazing — cause tension with host communities, which can escalate into hostility and eventually even violence. Migration-related conflict generally arises at the communal level, but can also lead to larger-scale, more politicised conflict (Null and Herzer Risi, 2016; Wilson Center, 2015).

Key human mobility related risks in West Nile relate first and foremost to the current

presence of refugees and the trajectory of ongoing conflict in South Sudan. A further deterioration of the security situation across the border could result in a renewed influx of refugees in West Nile, leading to increased pressures on livelihoods and food security, potentially driving communal conflict. On the other hand, more stability in South Sudan may result in out-migration as refugees decide to return home, which could relieve some of the current pressures on land, forestry and water resources.

Finally, in the longer term, changes in internal migration patterns and trends in Uganda could lead to increased demographic pressures, also in West Nile. For instance, when the arid northeastern regions of Uganda become less suitable for livestock rearing due to climate change, the more fertile northwestern regions could serve as better alternatives for herders in search of grazing lands. Poorly managed seasonal migration could quickly lead to transhumance-related conflicts, as seen in other regions in sub-Saharan Africa. In contrast, accelerated deforestation and further decreases in water availability and crop production in West Nile could also lead to major out-migration hotspots in the future. Finally, climate-induced human mobility could lead to a population spatial shift from rural to urban areas, causing demographic pressures in regional towns (Rigaud et al. 2021).

Intersectional risks and vulnerabilities

Climate change and environmental issues affect people differently depending on gender, age, occupational group, socioeconomic situation, disability, migration status, etc. Displaced persons, women, youth, elderly or disabled people can be considered as the most vulnerable because they have limited strategic options at their disposal to respond to challenges or take advantage of opportunities. The basis for adaptive capacity is often captured under the term 'optionality' (IOM and ICPALD, 2022). Major societal groups in the West Nile sub-region with arguably the lowest optionality include subsistence farmers - due to their dependence on weather patterns and natural resources -, as well as women, youth and refugees. Taken together, intersectional vulnerabilities experienced by women and other societal groups can further exacerbate inequality and exclusion as climate and environmental insecurity increases, which heighten the risk of eroding social cohesion and conflict.

In terms of gender, climate-related security risks can lead to shifting roles, norms, and dynamics in varying ways. This could be related to work and productivity, to migration and displacement, or result in gender-specific adaptation strategies (Carr and Thompson, 2014). For example, a well-documented climate adaptation strategy includes male migration in search for economic opportunities, while women stay behind with the family, become heads of household and take up other leadership functions. Interlocutors in West Nile explained how refugee men migrated towards the cities or regularly attempted to return temporarily to South Sudan to take care of property or other assets, while women stayed behind in refugee settlements.

Single-parent families and female-led households are generally less resilient to stressors, as new roles for women often come in addition to existing responsibilities, significantly increasing women's workload (Djoudi and Brockhaus, 2011). Nonetheless, women have consistently developed innovative ways to adapt to climate-induced pressures. When men migrate, women often become responsible for food preparation, processing, and preservation, as well as for land and property management. However, in addition to increased workload, women also face severe limitations due to gender

disparities and gender-biased traditions (Ibnouf, 2011). Women may have a lower uptake of climate-smart agricultural technology and practices compared to men due to lower access to information, time constraints, financial constraints including limited access to credit, lack of technologies and tools that are culturally and physically appropriate for use by women, weaker land tenure security and the additional labour requirements that are associated with implementing some agricultural practices (Bamanyaki, 2020).

Towards climate resilient and conflict sensitive food systems in West Nile

The previous sections highlighted how climate change and environmental pressures can affect livelihoods and food security in West Nile. It then laid out how these could increase the risk of violent conflict, especially around competition over forestry, water and land resources. The following chapter explores ways to build climate resilient livelihood and food systems in West Nile by identifying some best practices and lessons learned around climate adaptation.

As climate, peace and security are interconnected, the responses to risks related to them must also be interconnected. By linking climate change adaptation to peacebuilding, communities can increase their resilience to climate security risks. The UNEP framework around sustainable livelihoods and conflict sensitivity helps to connect different concepts and guide practitioners on how to build resilience against climate security risks (see figure 19).

It is based on two principles:
- If **sustainable livelihoods** are the foundation for human security and for successfully coping with and recovering from stresses and shocks, then building capacities that support sustainable livelihoods can build resilience and may also mitigate conflict; and,
- If **social cohesion** and **inclusive and effective governance** are key to coping with shocks and stresses such as violent conflict and climate change, then strengthening social cohesion within and between groups, while developing inclusive and effective governance, makes it possible to manage shocks peacefully. Social cohesion and improved governance can mitigate the factors that exacerbate security and conflict in times of stress, as well as mitigate the impacts of climate change (UNEP, 2019).

Sustainable livelihoods are the foundation of human security and for successfully coping with and recovering from stresses and shocks.

Core elements
- Social cohesion + inclusive and effective governance
- They underpin key capacities to cope with shocks and stresses including violent conflict and climate change
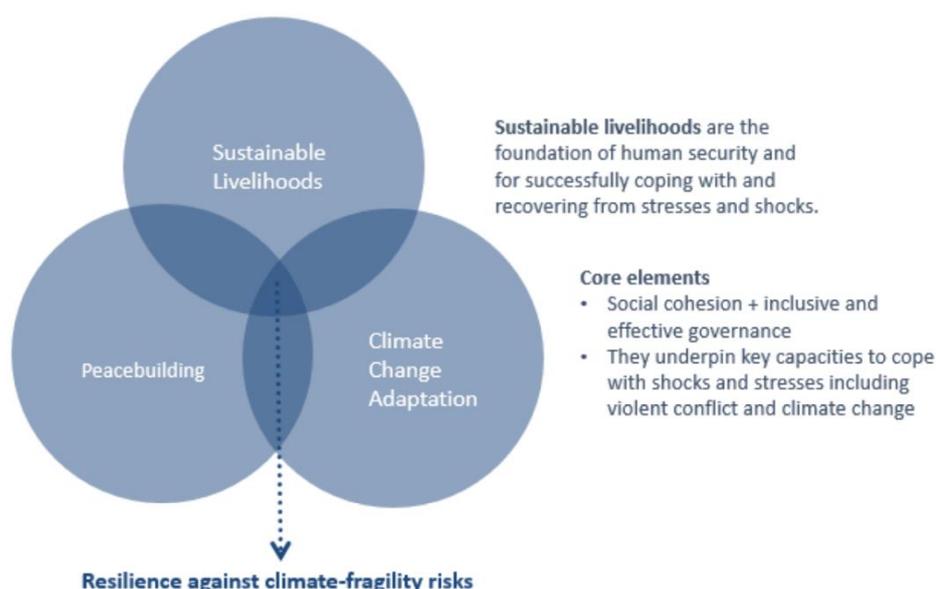
Figure 19: Linking climate adaptation and peacebuilding will increase resilience to climate security risks (UNEP, 2019)

Based on the principles of sustainable livelihoods, social cohesion, and inclusive and effective governance, WFP can contribute to building food systems in West Nile that are resilient under a range of climate and environmental pressures, while simultaneously contributing to conflict prevention and resolution. This requires interventions to be both climate-smart and conflict-sensitive, allowing different pillars of the food system to adapt to climate change and promote environmental restoration, increasing overall productivity and allowing more stable nutrition intake and livelihood security. This in turn strengthens social cohesion, allowing communities to improve internal and external relationships and sustain peaceful societies.

Based on a literature review and consultations with experts and practitioners, conflict-sensitive and climate-smart food systems require holistic and integrated approaches. The following best practices could be explored further by WFP and its partners for Uganda's West Nile sub-region:

Livelihood diversification and access to markets

Livelihood diversification is the process by which households construct a more diverse portfolio of activities and social support capabilities to improve their standards of living. This is a proven, successful coping strategy for people involved in climate sensitive sectors such as agriculture, forestry, pastoralism, and fisheries. It could include a more diverse crops portfolio, agropastoralism and agroforestry, enhanced vocational skills, investment in both on-farm and off-farm sources, as well as combining different agricultural activities and occupations (MacKenzie, 2020). Supporting people in diversifying their livelihoods can also contribute to strengthening social cohesion, for example between refugees and host communities. This could be done by decreasing the pressures on natural resources, by promoting mechanisms to enhance production, by fostering mutual benefits through resource-sharing or improved practices and technologies, and finally by creating synergies between people and communities around different socioeconomic opportunities.

Some small-scale projects in West Nile that showed promising results in terms of diversifying and generating income amongst refugees and host populations included beekeeping and agroforestry, but other options for skilled crafts or trades could be explored. According to key informants, skills development in tailoring and salon services had mixed results. Some of the suggested alternatives included urban farming, agroforestry, agro-processing, carpentry, energy production, the service sector, and construction. Such activities need to be based on a gender sensitive market assessment in which gaps, needs and opportunities can be identified. Women in particular have specific training needs in order to enhance their knowledge and skills in income-generating activities.

Providing a broader portfolio of training options from which beneficiaries can chose also helps to tailor skills development and increase the uptake. Livelihood diversification can only be successful when linked to better access to markets and facilities. These can help farmers to diversify their income by investing in businesses and to produce a surplus for local and regional markets (Hegazi et al., 2022). Some challenges that exist in West Nile in terms of accessing regional markets include the poor road infrastructure between refugee settlements and trade centres. However, improving this would require significant investments and private sector engagement. Some key informants suggested that one effective alternative to enhance access to markets for farmers and traders was to increase agricultural productivity within refugee settlements, which

would boost trade in and around refugee settlements and thus no longer require costly travel to regional markets.

The story of the maize trader

Climate change not only affects farmers, but also the traders who buy from them. Aruna Sanya, a refugee from the DRC, usually buys maize grain, beans, cassava chips and cassava flour from different farmer groups, to then sell to contractors. He began this business in 2018, when WFP introduced cash-based food assistance in Lobule Refugee Settlement.

He was then linked to farmer groups who were being supported by WFP, in order to buy their produce. Aruna sells the maize grain to Power Source Millers in Koboko town, who then process it as maize flour that is consequently packaged and sold on local markets.

During the dry season, Aruna's business slows down because there is less maize grown by the farmer groups. This not only affects Aruna's individual household income as a trader, but also affects everyone who plays a part in the maize value chain in Koboko District. Despite the lack of business during the dry season, Aruna hopes to continue linking with farmer groups throughout the year. When seasons become drier and less predictable due to climate change, Aruna might not be able to sustain his business.

Strengthened regulatory frameworks and natural resource sharing agreements

Inclusive and effective regulatory and policy frameworks for natural resource management that are supported and owned by all stakeholders are key to peacefully managing conflicts over land, water or forestry resources. Some examples of such policies could include regulations around environmental restoration planning, conservation practices, land management, pest control, trade regulations, cultivation policies, environmental law enforcement, etc.

While West Nile already has a relatively strong regulatory framework for agriculture and environment in place, the main challenge remains the implementation and enforcement of such policies. This is mainly due to the lack of presence and capacity of state authorities. In addition, most land, environmental management and agricultural practices are organised under customary law in West Nile rooted in local customs and practices. Top-down approaches to implement rules and regulations therefore need to be inclusive, conflict- and gender-sensitive, and carefully aligned with existing systems.

Apart from formal regulations, customary and informal systems that are climate- and conflict-sensitive have also resulted in positive impacts. For example, communal saving systems, as seen with the Yambara saving group (see story box), can help groups of smallholder farmers to build resilience, increase productivity, and strengthen social cohesion. Another proven effective way to prevent and mitigate the risk of conflict are natural resource sharing agreements in support of water, land, forest or pasture sharing. These are often informal and brokered at the household level, and allow continued and

safe access to fertile land, pastures and forestry, which can help people to increase their agricultural productivity. Especially when climate-related shocks and stressors affect natural resource availability, such agreements could help communities to engage with each other and discuss adaptation measures.

Informal land sharing agreements between refugees and local farmers in West Nile have, despite some cases of conflict, brought communities closer to each other and proven to be mutually beneficial. For instance, some farmers have managed to significantly increase their agricultural productivity by allowing refugees to work parts of their land. Oftentimes, such agreements could be facilitated by engaging local community leaders or through organisations working in and around the refugee settlements.

The story of the Yambura savings group

One day in Yambura village, Koboko District, a group of women realised that in order to fend for their families, they needed to start saving their money collectively, as a group. The women had some agricultural knowledge, but little to no capital to take advantage of the land around them.

They were eventually supported by WFP and its implementing partner *Associazione Centro Aiuti Volontari* (ACAV), and received training in group dynamics, post-harvest handling, financial literacy and record-keeping.

They also received agricultural inputs including a maize crib and pallets, all of which have helped them to harvest more. The group members were supported to open individual bank accounts and were linked to markets where they could sell their produce. The group later admitted male members, becoming the 'Yambura Women and Men Savings Group'.

One aspect that continues to affect this group of farmers is the long dry season from December to March. According to Rashid Agele, one of the members, they target to grow crops during the wet season, because during the dry season there is no access to water and very low productivity. While they manage to bridge this period through their savings from the wet season, improved irrigation and rainwater collection systems could help them to better secure their livelihoods during the dry season.

Climate-smart agricultural practices and techniques

Agriculture can become more climate resilient by using improved soil and water management, including through terrace farming, no-burn agricultural practices, rangeland rehabilitation, and investing in water management infrastructure such as water ponds, groundwater monitoring wells, small-scale irrigation systems and valley dams in water catchment areas to provide water for agricultural production. This would also include the protection of lake and river catchments and other sources of freshwater

(including aquifers) to secure a steady supply of freshwater across all sectors and communities.

Importing and increasing the production of nutrient-dense foods can also enable more diverse diets and achieve nutrition security in the face of increasing demographic and environmental pressures in the coming decades (GCRF-AFRICAP, 2022). Similarly, climate resilience can be strengthened by introducing and improving intercropping and bio-fortified crop varieties that are high yielding, early maturing, drought tolerant, flood-prone and more resistant to diseases. New crop varieties need to be in line with local agricultural knowledge and practice, local dietary practices and preferences, as well as market needs and demands (Bonilla-Findji, 2019). Cassava, sweet potato and sorghum are crops that are already grown in West Nile and known to be more climate resilient. In addition, considering the challenges related to accessing fertile land for refugees in West Nile, it is important to consider space-saving agricultural practices such as urban and vertical farming.

Introducing quality and high-yielding seed varieties that are adapted to changing climatic conditions can increase agricultural production and resilience to environmental shocks. Linking future climate and environmental conditions to seed systems can inform trade-offs in crop breeding, such as between shortening growing seasons and increasing temperatures (GCRF-AFRICAP, 2022). Seeds need to be adapted to the local environment and effectively distributed. Seed supply needs to be seasonally matched to farmers' needs (NU-TEC, 2022). Finally, better food storage and post-harvest handling can avoid loss of produce during or after harvest by streamlining food procurement and developing on-farm storage technologies and practices.

Climate-smart agricultural practices and techniques can also have important contributions to peace as they allow farmers to build resilience to climate shocks and enhance food security. Establishing a community of practice around climate-smart, sustainable agriculture can also help farmers to share knowledge, build synergies and strengthen relationships between and within communities, which can contribute to better mechanisms for conflict prevention and resolution. This requires initiatives to be conflict-sensitive, as illustrated in the example of agroforestry below.

World Vision's mixed group agroforestry project in Bidibidi refugee settlement

Osman, a local farmer and landowner near the Bidibidi refugee settlement in West Nile, looks pleased when presenting his farmland. He grows casava, sweet potatoes and several other vegetables together with fruit trees and other shrubs. His land looks much different compared to a few seasons ago, when, as he explains, his land was not used to its full potential and agricultural production remained low. After the arrival of refugees in and around his land, he decided to participate in a mixed group farming project of World Vision, one of WFP's implementing partners in West Nile.

He allowed to share his land with refugee farmers and received training and support from World Vision in agroforestry techniques and practices. Now, trees and shrubs

are growing across his farmland, which according to Osman has helped to keep the soil fertile and resulted in higher yielding crops, even after extended periods of drought.

Thanks to the profits made, Osman has been able to save some money, which he invested in livestock. In time, he hopes to expand his agricultural business. The refugees too have profited from this project as they gained access to farmland and share in the profits from the production.

Sustainable use of energy

Since energy is an enabler which underlies all economic activity, sustainable energy access is known to help improve livelihoods. This, in turn, prevents in the long run some of the structural causes of livelihood and food insecurity, and migration (Moralez Muñoz, 2017). Given the high dependency of both the local population and refugees in West Nile on firewood and charcoal for cooking, the sustainable use of energy sources is one of the key priorities to avoid further environmental degradation, especially loss of tree cover. Energy saving stoves, charcoal briquettes, or solar power are proven alternatives for cooking fuel that reduce the demand for timber (AAH, 2017). Given the different preferences, characteristics and financial means of households, the most effective way to make energy use in West Nile more sustainable would be to facilitate access to different types of 'greener' cooking stoves and promote more sustainable cooking practices.

In order to most effectively scale-up the provision of improved cooking solutions and advancement of reforestation, a market-based approach should be adopted. This would allow private sector participation to more sustainably meet the cooking energy needs. Improved cooking solutions need to have a high degree of user acceptance and be tailored for the end-users' cooking needs, preferences and practices, whilst ensuring a high degree of usability, efficiency and safety. To reach scale and ensure long-term sustainability most effectively in modern cooking access, it is necessary to enable a sustainable market and to move away from the traditional humanitarian response mechanism of donations and handouts. Finally, if improved cooking efforts are coupled with reforestation initiatives, innovative financing mechanisms can be developed such as access to climate funding (World Vision, 2019).

Environmental conservation and regeneration

In parallel with promoting sustainable cooking solutions, regreening the environment is critical for healthier soils and ecosystems. This also reduces the adverse effects of climate-related shocks, such as drought, flooding, water runoff and landslides. The disappearance of tree cover can speed soil erosion and rob the land of its ability to hold water. Regreening programmes can include planting wood lots, tree nursery projects, agroforestry, and awareness raising about tree planting and care.

Host communities and refugees in West Nile could work together in such initiatives, which are mutually beneficial and allow to strengthen social cohesion. Identifying specific roles, shared approaches and interests are important elements to make sure such initiatives contribute to sustainable peace.

Conflict-sensitive programming

Humanitarian and development programmes cannot be separated from the complex system in which they intervene, especially when the context is volatile to conflict within or between communities. Otherwise, such projects and activities may create divisions and can contribute to local tensions between people who benefited from the intervention and those who felt excluded. A conflict-sensitive approach takes different conceptual and contextual principles into account, allowing humanitarian and development actors to gain a deeper understanding of risks and avoid unintended or harmful consequences of their intervention.

Though there are numerous examples of initiatives in and around refugee settlements that focus on renewable energy sources or environmental conservation and regeneration, these projects are seldom designed, implemented or evaluated in ways that address their potential to provoke or prevent conflict. These projects can lead to unequal access to and distribution of benefits, potentially raising tensions. To take steps in anticipating, preventing, reducing and addressing discord that can arise from such projects, local stakeholders and communities need to be included and consulted throughout each stage of the project. This will increase awareness of conflict risks and other potential ramifications, allowing to develop approaches for mitigation (Nyakerario and Mirumachi, 2022).

Conflict-sensitive programming therefore involves an extensive stakeholders mapping and conflict analysis, which provide the necessary contextual information to make conflict-sensitive decisions. It considers existing analyses and applies conflict sensitivity indicators to identify and manage the risks, formulates options to adapt activities and leverage opportunities for building and sustaining peace. A positive example of conflict-sensitive programming in West Nile includes block farming projects in which mixed groups of smallholder farmers – consisting of host community members and refugees - are allocated appropriate land area for cultivation. Beneficiaries not only gain access to farmland but also receive other forms of support, including start-up kits and training and capacity building. According to implementing organisations and participants, such an inclusive approach helped to bring communities closer to each other, fostering natural resource sharing agreements and preventing communal conflict over farmland. Another successful strategy was to develop dialogue platforms in which refugees and host community members participate, and during which they could discuss what kind of aid is needed and how aid should be shared amongst them. This helped to generate ownership and responsibility amongst communities. Finally, implementing organisations also need to work through the host community and refugee structures, as they have their own governance mechanism. Ignoring existing structures may also cause intra-communal tensions.

Capacity-building and awareness raising

Agricultural production and practices in West Nile remain relatively poor, and the uptake of high-yield, climate-smart farming has generally been slow. Investing in more capacity building can help to increase agricultural productivity and enable farmers to adapt climate-smart agricultural technologies and practices to improve production and management, through which they can build climate resilience. Increased capacity also allows local actors to better manage and share natural resources. Positive examples in West Nile also included linking agriculture to education by organising climate-smart agriculture and agroforestry projects in and around schools, involving both students and

parents. This not only provided better access to school meals, but also worked as an incentive to school enrolment and increased agricultural skills (see WFP's cross-learning visits)

Similarly, access to weather information services, especially extreme weather warning, weather forecasts, and seasonal information, can help farmers to better prepare their land and increase their agricultural productivity. Such services have been piloted with promising results, but some challenges remain, including the reliability of meteorological data.

WFP's cross-learning visits: The story of the school that feeds itself

Often when WFP wants to replicate best practices, it organises 'cross-learning visits' where stakeholders travel to areas to learn about good practices and take them back to their own regions. One group of stakeholders from Koboko District were supported by WFP to travel to Gulu District to witness the practice of feeding children at school, as an incentive for students to come to school, and keep in school.

When they took what they had learned back to Koboko District, one participant, Felix Bakole, the headteacher of a small primary school, became particularly interested. He began growing cassava at the school, which is taken care of by the students, and eventually fed to them. The project is primarily led by the students' parents.

Felix noticed immediately the effect of feeding the pupils at school. There was an increase in school enrolment, and the rate of absenteeism and school dropout reduced. Students participated more vigorously in class, and their test scores improved. Felix also made sure that the project is primarily run by the parents, which has strengthened the relationship between the school and the community.

However, during the dry season, the vegetables do not grow as easily, which affects the students' diet. Felix devised a solution. He began to plant trees all around the border of the school, which he says has allowed the school gardens to flourish throughout the year, and for the parent-led school-feeding programme to run smoothly. He told WFP that he hopes to expand the students' diet by growing a wider variety of food and improving the school's food storage practices.

Coordination and harmonisation

Different kinds of support provided by different actors can quickly cause resentment between beneficiaries and those who do not have access to these services. Some examples included the lack of standardisation around cash transfers (i.e. different amounts provided by different implementing organisations) and the differing quantity and quality of aid packages or food distributions, depending on the donor. Similarly, humanitarian and development actors were not always aware of which kind of projects or activities were being undertaken by partner organisations active in West Nile.

Implementing organisations therefore argued for more coordination and harmonisation of activities. Imbalanced service distribution can also be a source of conflict within and between communities. Therefore, projects and activities implemented by different actors should be well-aligned along shared principles of fairness.

Another key aspect of enhanced coordination and harmonisation is around sharing information and identifying research and data gaps. These include, but are not limited to, gender dynamics of climate insecurity, best practices around climate adaptation, conflict analysis, climate risk management, climate change indicators, environmental and climate monitoring, climate modelling and forecasting.

Entry points and priorities for WFP

Based on the analysis in previous sections, this report lists some non-exhaustive and complementary entry points for WFP to strengthen its work related to climate resilience, climate adaptation and peacebuilding in West Nile. These are summarised in the table below.

These entry points are intended as a starting point to inform WFP's strategic planning and future programming. As part of the process of incorporating these into WFP's work, they should be tested and discussed with other stakeholders active in the West Nile region. Implementation will require coordination between WFP, its partners, and other stakeholders.

No.	Area	Entry points and priorities for WFP
1	**Promoting climate-smart agriculture**, which includes tools and practices to support farmers and pastoralists to build resilience to climate pressures and increase productivity.	• Collaborate with partners and local stakeholders to **identify needs / challenges** related to climate-smart agriculture. • **Explore approaches** like agroforestry, urban farming, promoting nutrient-dense foods, intercropping, bio-fortified crop varieties, high-yielding seed varieties, and supporting enhanced food storage and post-harvest handling. • **Promote mixed groups** of participants to strengthen social cohesion within and between communities.
2	**Livelihood diversification**, which can help communities dependent on natural resources adapt to environmental shocks and build resilience.	• Develop a **strategy to diversify livelihoods**, particularly for refugees, while ensuring alternative livelihoods do not have negative environmental impacts. • **Enhance refugees' access to markets**, for instance by scaling WFP's Agriculture and Market Support (AMS) programme. • **Promote synergies** within and between communities.
3	**Sustainable management of natural resources**, which is essential for ecosystem services,	• Identify and build on **shared interests and mutual benefits** between and within communities.

	food security, and the ongoing viability of pastoralism and agriculture. Forestry, water, wetland and fertile land resources must be better managed.	- Help to **broker formal and informal natural resource sharing agreements** between refugees and host communities. - Explore ways to **increase water availability,** e.g. through irrigation systems and water capture and storage. - Invest in **reforestation and conservation projects**, particularly around agroforestry. - Support / lead efforts to **protect wetlands from degradation.** - Promote **energy-saving and green cooking systems,** including solar, to minimise use of firewood and charcoal.
4	**Draw linkages between climate adaptation and social cohesion**, which is essential for managing conflict and building sustainable peace.	**Identify synergies** between climate adaptation and activities that help **bridge communities** and **strengthen social relations.** - Focus on opportunities to work towards **shared interests**, **common goods** and **mutual benefits** between and within communities, especially between refugees and host communities.
5	In line with entry point 4, **WFP should integrate a climate- and conflict-sensitive, peace-oriented approach**, which actively seeks to prevent conflict, enhance climate resilience and build sustainable peace, and considers how WFP's interventions interact with its context and follows the 'do no harm' principle.	- Adopt a **conflict-sensitive and peace-oriented approach** to inform design, implementation, monitoring and evaluation of programmes and projects. - Develop specific **climate, peace and security indicators and objectives** that enhance social cohesion, build synergies and improve relations between and within communities. **Appoint designated staff and focal points** that are responsible for mainstreaming a **climate, peace and security lens** within WFP.
6	**Address research and data gaps to strengthen policy and regulatory frameworks**, through integration of climate security issues.	- Develop / implement **policies and regulatory frameworks** that contribute to climate-smart, more resilient food systems, agriculture and natural resources management. - Address **research gaps** by collaborating with partners / stakeholders to **collect and analyse climate and food-related data**. - Integrate **climate modelling and projections** into WFP's reporting and assessments.
7	**Capacity-building and awareness raising,** to improve the delivery of climate information across different sectors of the food system.	Collaborate with partners / stakeholders to **develop programmes that can build capacity** in climate security and

		resilience, climate adaptation and climate-smart food programmes.
		• Develop **information products targeting climate fragile communities**, e.g. related to weather forecasts, seasonal forecasts, agricultural information etc.
		• Incorporate **climate security information** for the different components of food systems **in early warning systems** and emergency response mechanisms.
8	**Partnerships and coordination,** to strengthen climate adaptation and resilience-building.	• WFP could establish new **partnerships** and strengthen existing ones to bring in more experience and expertise around climate- and conflict-sensitive programming in West Nile. Especially partnerships with local actors should be fostered. • WFP could develop a **climate security and adaptation platform** to periodically bring together different actors and stakeholders in West Nile, during which relevant issues could be discussed. This will also lead to fruitful exchanges and improved planning and coordination of activities.

Table 1: Summary of entry points and priorities for WFP

References

Action Against Hunger (AAH) (2017). Bridging the Gap: Long-Term Implications for South Sudanese. Refugees in West Nile, Uganda. Retrieved from: https://www.csrf-southsudan.org/repository/bridging-gap-long-term-implications-south-sudanese-refugees-west-nile-uganda/

Akinro, A. O., Opeyemi, D. A. and Ologunagba, I. B. (2008). Climate change and environmental degradation in the Niger Delta Region of Nigeria: Its vulnerability, impacts and possible mitigations. Research Journal of Applied Sciences, vol. 3, no. 3. Retrieved from: https://medwelljournals.com/abstract/?doi=rjasci.2008.167.173

Bamanyaki, P.A. (2020) Barriers and opportunities for gender-responsive climate-smart agriculture adoption in Northern Uganda. Climate Change, Agriculture and Food Security (CCAFS) Info Note. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Retrieved from: https://ccafs.cgiar.org/resources/publications/barriers-and-opportunities-gender-responsive-climate-smart-agriculture

Bonilla-Findji, O. ; Eitzinger, A.; Andrieu, N.; Jarvis, A.; Recha, J.; Ambaw, G.; Kakeeto, R. (2019). 2018-CSA Monitoring: Hoima Climate-Smart Village (Uganda). Retrieved from: https://doi.org/10.7910/DVN/RJGSDF

Buzigi, E. (2018) Trends of Child Wasting and Stunting in Uganda from 1995 to 2016, and Progress Towards 65th World Health Assembly Global Nutrition Targets. Journal of Food and Nutrition Sciences. Vol. 6, No. 4. Retrieved from: https://www.sciencepublishinggroup.com/journal/paperinfo?journalid=154&doi=10.11648/j.jfns.20180604.11

Caffrey, P.; Finan, T.; Trzaska, S.; Miller, D.; Laker-Ojok, R.; Huston, S. (2013). Uganda Climate Change Vulnerability Assessment Report. African and Latin American Resilience to Climate Change Project (ARCC) Retrieved from: https://www.climatelinks.org/resources

Carr, E. R.; and Thompson, M. C. (2014). Gender and climate change adaptation in agrarian settings: Current thinking, new directions, and research frontiers: Gender and climate change adaptation in agrarian settings. Geography Compass, vol. 8, no. 3. Retrieved from: https://compass.onlinelibrary.wiley.com/doi/abs/10.1111/gec3.12121

Caus, J.; O'Neil, S. (2021) Climate change is fueling recruitment into armed groups. United Nations University (UNU). Retrieved from: https://ourworld.unu.edu/en/climate-change-is-fueling-recruitment-into-armed-groups

Coffel, E. D., Keith, B., Lesk, C., Horton, R. M., Bower, E., Lee, J., & Mankin, J. S. (2019). Future hot and dry years worsen Nile Basin water scarcity despite projected precipitation increases. *Earth's Future*, 7, 967– 977. Retrieved from: https://doi.org/10.1029/2019EF001247

Coppock, D. L. ; and Desta, S., (2013) Collective action, innovation, and wealth generation among settled pastoral women in northern Kenya. Rangeland Ecology & Management, vol. 66, no. 1. Retrieved from: https://repository.arizona.edu/handle/10150/642692

Danish Refugee Council (DRC), Danish Demining Group (DDM), European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO), Save the Children, ZOA. (2018). Contested Refuge: The Political Economy and Conflict Dynamics in Uganda's Bidibidi Refugee Settlements. Retrieved from: https://reliefweb.int/report/uganda/contested-refuge-political-economy-and-conflict-dynamics-ugandas-bidi-bidi-refugee

Danish Refugee Council (DRC), et al. (2017). Conflict Analysis Assessment: Support Program to the Refugee Settlements and Host Communities in Northern Uganda. Retrieved from: https://eutf.akvoapp.org/media/db/project/5455/document/DRC_EUTF%20Conflict%20Assessment%20Baseline%20Report_SuVrY5C.pdf

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2019). Response to increased demand on Government Services and creation of economic opportunities in Uganda (RISE): Support to refugees and host communities in Northern Uganda. Retrieved from: https://www.giz.de/en/worldwide/74940.html

Development Initiatives (DI). (2020). Poverty in Uganda : National and regional data and trends. Retrieved from: https://devinit.org/resources/poverty-uganda-national-and-regional-data-and-trends/#:~:text=Moses%20Owori-,Key%20findings,slightly%20between%202013%20and%202016

Djoudi, H. ; and Brockhaus, M. (2011) Is adaptation to climate change gender neutral? Lessons from communities dependent on livestock and forests in northern Mali. International Forestry Review, vol. 13, no. 2. Retrieved from: https://www.cifor.org/knowledge/publication/3524

Easton-Calabria, E. (26 August 2021). Uganda has a remarkable history of hosting refugees, but its efforts are underfunded. Retrieved from: https://theconversation.com/uganda-has-a-remarkable-history-of-hosting-refugees-but-its-efforts-are-underfunded-166706

Famine Early Warning Systems Network (FEWS NET) (2011) Livelihood Zone Map
Food and Agriculture Organization (FAO) (2018) Food security, resilience and well-being analysis of refugees and host communities in Northern Uganda. FAO Resilience Analysis Report No. 12. Retrieved from: https://www.fao.org/publications/card/en/c/I9708EN

Food and Agriculture Organization (FAO) (2019) The future of livestock in Uganda: Opportunities and challenges in the face of uncertainty. Retrieved from: https://www.fao.org/documents/card/en/c/ca5420en

Food and Agriculture Organization (FAO) (October 2021) Evidence and policy options on migration, cash crop production and deforestation in Uganda. Retrieved from: https://www.fao.org/publications/card/en/c/CB7080EN

Glaser, S. M.; Cullen, S.; Hendrix, B.F.; Weding, K. ; Kaufman, L. (2019). Armed conflict and fisheries in the Lake Victoria basin. Ecology and Society 24 (1): 25. Retrieved from: https://www.ecologyandsociety.org/vol24/iss1/art25/

Global Challenges Research Fund programme, Agricultural and Food System Resilience: Increasing Capacity and Advising Policy" (GCRF-AFRICAP) (2022) Agricultural and food system resilience: Increasing capacity and advising policy. Retrieved from: https://africap.info/climate-change-threatens-sub-saharan-food-supplies-but-action-now-could-avert-shock-and-dramatically-increase-yields-modelling-finds/#more-2018

Global Hunger Index (GHI) (2019). Uganda: A closer look at hinger and undernutrition. Retrieved from: https://www.globalhungerindex.org/case-studies/2018-uganda.html

Hassan, I. et al., (2020). Potential impacts of climate change on extreme weather events in the Niger Delta part of Nigeria. Hydrology, vol. 7, no. 1. Retrieved from: https://www.mdpi.com/2306-5338/7/1/19

Hegazi, F.; Murugani, V.; Pacillo, G.; Läderbach, P. (2022) The World Food Programme's contribution to improving the prospects for peace in Ethiopia. Stockholm International Peace Research Institute (SIPRI). Retrieved from: https://www.sipri.org/sites/default/files/2022-04/wfp_country_report_ethiopia_0.pdf

Herbert, S. & Idris, I. (2018). Refugees in Uganda: (in)stability, conflict, and resilience. Rapid Literature Review. Birmingham, UK: GSDRC, University of Birmingham. Retrieved from: https://gsdrc.org/publications/refugees-in-uganda-instability-conflict-and-resilience/

Ibnouf, F.O. (2011). Challenges and possibilities for achieving household food security in the Western Sudan region: the role of female farmers. Food Security volume 3, pages 215–231. Retrieved from: https://link.springer.com/article/10.1007/s12571-011-0118-3

Impacts of Climate Change in Uganda. Data Water Sector Report. Retrieved from: https://www.futurewater.eu/projects/climate-change-uganda/

Internal Displacement Monitoring Centre (IDMC) 2021. Global Report on Internal Displacement (GRID). Retrieved from: https://www.internal-displacement.org/global-report/grid2021/

International Alert (2013). Governance and livelihoods in Uganda's oil-rich Albertine Graben. Retrieved from: https://www.international-alert.org/publications/governance-and-livelihoods-ugandas-oil-rich-albertine-graben/

International Crisis Group (2022) A Vicious Cycle: Climate and Conflict in the Horn of Africa. In: The Horn (podcast series). Season 3, Episode 9. Retrieved from: https://www.crisisgroup.org/africa/horn-africa/horn

IOM and ICPALD (2022) Equipped to adapt? A review of climate hazards and pastoralists' responses in the IGAD region. Retrieved from: https://icpald.org/wp-content/uploads/2022/09/ICPALD-IOM-Pastoralism-Report.pdf

Liebig, T.; Pacillo, G.; Osorio, D.; Läderach, P. (2022) Food systems science for peace and security: Is research for development key for achieving systematic change? World Development Sustainability Volume 1. Retrieved from: https://doi.org/10.1016/j.wds.2022.100004

Logie, C.H.; Okumu, M.; Latif, M.; et al. (2021) Exploring resource scarcity and contextual influences on wellbeing among young refugees in Bidi Bidi refugee settlement, Uganda: Findings from a qualitative study. Conflict and Health, vol. 15, no. 1. Retrieved from: https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-020-00336-3#citeas

Lomo, Z. and Hovil, L., (2004). Behind the Violence: The War in Northern Uganda. Monograph No 99, Institute for Security Studies, Pretoria, South Africa. Retrieved from: https://gsdrc.org/document-library/behind-the-violence-the-war-in-northern-uganda/

MacKenzie, D. (2020) Climate Risk Profile: Uganda. The World Bank Group. Retrieved from: https://climateknowledgeportal.worldbank.org/sites/default/files/2020-06/15464-WB_Uganda%20Country%20Profile-WEB_v1.pdf

McSweeney, C.; New, M.; Lizcano, G. (2010). UNDP Climate Change Country Profiles: Uganda. Retrieved from: https://www.undp.org/content/dam/LECB/docs/pubs-reports/undp-ndc-sp-uganda-ggds-green-growth-dev-strategy-20171204.pdf

Ministry of Water and Environment (UMWE) (2015). Economic Assessment of the Impacts of Climate Change in Uganda – National Level Assessment: Agricultural Sector Report. Retrieved from: https://www.preventionweb.net/publication/economic-assessment-impacts-climate-change-uganda

Ministry of Water and Environment (UMWE) (April 2015). Uganda National Climate Change Policy: Transformation through Climate Change Mitigation and Adaptation. Retrieved from: https://www.mwe.go.ug/library/national-climate-change-policy

Mkutu, K. A. (2008). Uganda: Pastoral Conflict & Gender Relations. Review of African Political Economy, 35(116), Retrieved from: http://www.jstor.org/stable/20406504

Moralez Muñoz, H. (2017) The Role of Sustainable Energy Access in the Migration Debate. European Union. Retrieved from: https://www.researchgate.net/publication/340528004_The_Role_of_Sustainable_Energy_Access_in_the_Migration_Debate

Mugyenyi, O.; Kisaame, K.E.; Kaggwa, R. (2011) Marginalization of Environment and Natural Resources Sub-Sector Undermining the Economic Base and Entrenching Poverty in Uganda. Advocates Coalition for Development and Environment (ACODE). Retrieved from: https://www.africaportal.org/publications/marginalization-of-environment-and-natural-resources-sub-sector-undermining-the-economic-base-and-entrenching-poverty-in-uganda/

Nagarajan, C.; Binder, L.; Destrijcker, L.; Michelini, S.; Rüttinger, L.; Sangaré, B.; Šedová, B.; Vivekananda, J.; Zaatour, R. (2022) Weathering Risk climate, peace and security

assessment: Mali. Retrieved from: https://weatheringrisk.org/en/publication/climate-peace-and-security-assessment-mali

Nkhoma, B.; and Kayira, G. (2016). Gender and power contestations over water use in irrigation schemes: Lessons from the lake Chilwa basin. Physics and Chemistry of the Earth, Parts A/B/C, vol. 92. Retrieved from: https://ui.adsabs.harvard.edu/abs/2016PCE....92...79N/abstract

NU-TEC (2022) Northern Uganda - Transforming the Economy through Climate Smart Agriculture. Retreived from: https://beamexchange.org/practice/programme-index/259/

Null, S.; Herzer Risi, L. (2016) Navigating Complexity: Climate, Migration, and Conflict in a Changing World. Wilson Center. Retrieved from: https://www.wilsoncenter.org/publication/navigating-complexity-climate-migration-and-conflict-changing-world

Nyakerario, R.; Miumachi, N. (2022) Conflict sensitivity and renewable energy: a case study from Kenya's Kakuma Refugee Camp. Stockholm Environment Institute (SEI) and King's College London (KCL). Retrieved from: https://www.sei.org/wp-content/uploads/2022/12/conflict-sensitivity-and-renewable-energy.pdf

Rigaud, K.K.; de Sherbinin, A.; Jones, B.; Casals Fernandez, A.T.; Adamo, S. (2021). Groundswell Africa : A Deep Dive Into Internal Climate Migration in Uganda. World Bank, Washington, DC. Retrieved from : https://openknowledge.worldbank.org/handle/10986/36447

Rugumayo, A. I.; Jennings, E.; Linnane, S.; Misstear, B. (2015). Water Resources in Uganda. In : Water is Life, Honor Fagan, G. ; Linnane, S.; McGuigan, K. G. ; Rugumayo, A. I. Eds. Rugby, United Kingdom: Practical Action Publishing, pp. 73–96. Retrieved from: https://www.adaptationcommunity.net/wp-content/uploads/2021/02/GIZ_Climate-risk-profile-Uganda_EN_final.pdf

Rüttinger, L., Smith, D., Stang, G., Tänzler, D., Vivekananda, J. (2015) A New Climate for Peace: Taking action on climate and fragility risks. adelphi: climate diplomacy. Retrieved from: https://climate-diplomacy.org/magazine/conflict/new-climate-peace

Sample, E. (2021). An Assessment of the Risk of Mass Atrocities in Uganda. International Order & Conflict Policy Paper. The Stimson Centre. Online. Retrieved from: https://stimson.org/wp-content/uploads/2021/10/An-Assessment-of-the-Risk-of-Mass-Atrocities-in-Uganda.pdf

Slater, R.; McCord, A.; Devereux, S.; Baur, D.; Trotter, D.; Bright, R. (2021) Beyond COVID-19: Lessons for social protection from WFP's work in East Africa in 2020. Retrieved from: https://www.wfp.org/publications/beyond-covid-19-lessons-social-protection-wfps-work-east-africa-2020

Smith, E. (2022) Gender dimensions of climate insecurity. Stockholm International Peace Research Institute (SIPRI). Retrieved from: https://www.sipri.org/publications/2022/sipri-insights-peace-and-security/gender-dimensions-climate-insecurity

Taylor, T., A. Markandya, P. Droogers, A. Rugumayo (2014) Economic Assessment of the
Tomalka, J.; Lange, S.; Röhrig, F.; Gornott, C. (2021). Climate risk profile: Uganda.
Potsdam Institute for Climate Impact Research (PIK). Retrieved from:
https://www.adaptationcommunity.net/wp-content/uploads/2021/02/GIZ_Climate-
risk-profile-Uganda_EN_final.pdf

Transparency International (2022) Corruption Perceptions Index. Retrieved from:
https://www.transparency.org/en/cpi/2021/index/uga

Tschunkert, K.; Murugani, V.; Delgado, C. (2021) Food Systems in Conflict and
Peacebuilding Settings: Pathways and Interconnections. Stockholm International
Peace Research Institute (SIPRI). Retrieved from:
https://www.sipri.org/publications/2021/other-publications/food-systems-conflict-
and-peacebuilding-settings-pathways-and-interconnections

Uganda Livelihood Zones. Retrieved from: https://fews.net/east-
africa/uganda/livelihood-zone-map/march-2010

Uganda Ministry of Water and Environment (UMWE) (2015). Intended Nationally-
Determined Contributions (INDC). Retrieved from:
https://www4.unfccc.int/sites/NDCStaging/pages/Party.aspx?party=UGA

Uganda National Planning Authority (UNPA) (2013). Vision 2040. Retrieved from:
http://www.npa.go.ug/uganda-vision-2040/

Uganda National Planning Authority (UNPA) (2018). The Uganda Green Growth
Development Strategy, 2017/18–2030/31. Retrieved from:
http://www.npa.go.ug/about-npa/uganda-green-growth-development-strategy/

Uganda Parliament (1995) Constitution of the Republic of Uganda.

Uganda Refugee Act (2006) Government of Uganda. Retrieved from:
https://www.refworld.org/docid/4b7baba52.html

Uganda Refugees Regulations (2010) Government of Uganda. Retrieved from:
https://www.refworld.org/pdfid/544e4f154.pdf

UNEP (2019) Addressing Climate-Fragility Risks. Toolkits, manuals and guides.
Retrieved from: https://www.unep.org/resources/toolkits-manuals-and-
guides/addressing-climate-fragility-
risks?_ga=2.211006871.365554300.1656485530-1855594995.1651480114

UN-Habitat (2019). Integrated and Multi-Scalar Planning in West Nile Region, Uganda.
Retrieved from: https://unhabitat.org/integrated-and-multi-scalar-planning-in-west-
nile-region-uganda

UN-Habitat (2021). Economic Development Assessment in West Nile Region, Uganda.
Retrieved from: https://unhabitat.org/economic-development-assessment-in-west-
nile-region-uganda

UNHCR (2021). Uganda Comprehensive Refugee Response Portal. Retrieved from: https://data2.unhcr.org/en/country/uga

USAID (2012). Uganda Climate Vulnerability Profile. Retrieved from: https://www.climatelinks.org/sites/default/files/asset/document/uganda_climate_vulnerability_profile_jan2013.pdf

West Nile Web (2018). Regional Overview. Retrieved from: https://www.westnileweb.com/index.php/the-region

Wilson Center (2015, August). Climate Change, Migration, and Conflict Workshop. Woodrow Wilson International Center for Scholars, Washington, DC.

World Bank (2018) Groundswell: Preparing for Internal Climate Migration. Retrieved from: https://openknowledge.worldbank.org/handle/10986/29461

World Economic Forum (2021). Global Gender Gap Report 2021, Retrieved from: https://www3.weforum.org/docs/WEF_GGGR_2021.pdf

World Food Programme (WFP) (April 2022) Report of the Gender Assessment in Refugee Hosting Districts of West Nile.

World Food Programme (WFP) (2017) The impacts of climate change on food security and livelihoods in Karamoja. Retrieved from: https://www.wfp.org/publications/2017-impacts-climate-change-food-security-and-livelihoods-karamoja

World Food Programme (WFP) (2021). WFP's support to the government of Uganda's COVID-19 response. Retrieved from: https://www.wfp.org/publications/wfp-support-government-uganda-covid-19-response-2021

World Food Programme (WFP) (December 2020). Social Protection Learning Facility Policy Brief #2. Retrieved from: https://www.wfp.org/publications/social-protection-and-covid-19-amidst-climate-shocks-2020

World Food Programme (WFP) (January 2020). Analysis of Refugee Vulnerability in Uganda. Retrieved from: https://www.wfp.org/publications/analysis-refugee-vulnerability-uganda-2020

World Food Programme (WFP) (May 2022). WFP in West Nile and Acholi. Arua Area Office Brief. May 2022.

World Food Summit (WFS) (1996). Rome Declaration on World Food Security. Retrieved from: https://www.fao.org/wfs/index_en.htm

World Population Review (WPR) (2022) Uganda Population 2022 (Live). Retrieved from: https://worldpopulationreview.com/countries/uganda-population

World Vision International (WVI) (2017). Good Enough Context Analysis for Rapid Response (GECARR) for West Nile, Uganda, July 2017. World Vision International. Retrieved from: https://www.wvi.org/world-vision-european-union/publication/good-enough-context-analysis-rapid-response-gecarr-west-nile

World Vision International (WVI) (April 2019) Cooking Energy Assessment in the Bidi Bidi Settlement Yumbe District, Uganda.

World Vision International (WVI) (2020). Navigating the Nexus; A brighter future for refugee and host community children in West Nile, Uganda. World Vision International. Retrieved from: https://www.wvi.org/publications/case-study/uganda/navigating-nexus-brighter-future-refugee-and-host-community-children

Zinyengere, N.; Araujo, J.; Marsham, J.; Rowell, D. (November 2016). Uganda country fact sheet: current and projected future climate. In: Africa's climate helping decision-makers make sense of climate information. Future Climate for Africa. Retrieved from: https://cdkn.org/resource/africas-climate-helping-decision-makers-make-sense-climate-information

Annexes

Annex 1: Commodity comparison and climate-related vulnerability comparison by crop

	Maize	Coffee	Beans	Cassava	Matooke	Sweet Potato	Rice	Sorghum
Level of Strategic Priority (DSIP)	I	2	3	4	5	6	7	8
Time of Introduction I= indigenous, 2=pre-colonial & colonial, 3=recent	2	I R 2 A	I	2	I	2	3	I F 3 S
Importance for Food Security	Med	Low	High	High	High	High	Med	High
Importance for Livelihoods	High	High	Low	Med	High	Low	High	Med
Level of Integration & Commercialization of Value Chain	High	High	Low	Med	Med	Low	High	Low F High S
Vulnerability to Disease	Low	High	Med	High	High	Med	Med	Low
Vulnerability to Climate	Med	High A Med R	Med	Low	Med	Low	High	Med

Key: A=Arabica and R=Robusta, F= Sorghum for Food, and S= Sweet Sorghum for Brewing

Figure 20: Overall commodity comparison (Caffrey et al., 2013)

Vulnerability	Coffee*	Matooke	Maize	Beans	Rice	Sorghum	Sweet Potatoes	Cassava
Rising temperature threatens suitability for production	+++	++	++	+	+	+	+	0
Falling soil fertility reduces yields and makes crop more vulnerable to climatic stresses	+++	+++	+++	++	++	++	+	+
Poor moisture retention capacity of soils increases vulnerability to precipitation variability	+++	+++	++	++	++	+	+	+
Pests and diseases increasing with rising temperatures	+++	+++	+	++	++	+	+	-
International prices increasingly volatile as a result of climate change impacts on supply	++	0	++	0	0	0	0	0
High temperatures and unseasonable rain promote rapid spoilage and threaten quality	+++	+++	++	+	0	0	+	+
Rising international concern over carbon footprint may threaten demand for exports	+++	++	0	0	0	0	0	0
Shortages of disease-free planting materials, exacerbated by unreliable precipitation	+++	+++	0	0	0	0	+++	+++
Crop is perishable. Extreme precipitation and flooding make transport more costly & difficult	++	++	+	+	+	+	++	++
Increasing variability of precipitation and extreme events threatens suitability for production	++	++	+++	+++	+++	+	+	+

Key: Relative impact of climate change on various aspects of vulnerability by crop:

+++ Highly Vulnerable
++ Moderately Vulnerable
+ Limited Vulnerability
0 Not Affected

Note: Threat of rising temperatures is much more acute for Arabica coffee than for Robusta

Figure 21: Comparison of the extent of climate-related vulnerability by crop (source: Caffrey et al., 2013)

Imprint

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