UGANDA

Climate Hazard Assessment– Isingiro District

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Climate Hazard in Uganda's Refugee-Hosting Districts

INTRODUCTION

Uganda hosts one of the largest refugee populations in Africa,[1] many of whom live in climate-sensitive landscapes highly vulnerable to the impacts of climate change due to its reliance on rain-fed agriculture, limited adaptive capacity, and high exposure to extreme weather events such as floods, droughts, and prolonged dry spells.[2] Over recent decades, the country has experienced more frequent and intense climate hazards, undermining livelihoods, food security, health, and infrastructure.[34] Uganda's climate is characterized by a bimodal rainfall pattern; however, this pattern has become increasingly unpredictable, with delayed onset and erratic distribution of rainfall that disrupts agricultural cycles.[5]

Key National Signals

Temperatures have risen by ~1.0 –1.5°C over the last five decades, increasing heat stress and evapotranspiration.

More erratic rainfall: delayed onset, mid-season dry spells, intense rainfall events

Prolonged dry spells and flooding now co-exist as dominant hazards, disrupting agriculture, water access, transport, and shelter

Climate hazards vary across the country, with distinct patterns between the Northern/West Nile and Southwestern regions, highlighting the need for localized analysis. Although both regions are projected to become warmer and wetter by mid-century, the impacts will differ significantly due to variations in baseline conditions, terrain, and livelihood systems.

In the Northern/West Nile region including Yumbe, Koboko, Adjumani, Madi Okollo, Terego, Obongi, and Lamwo, average temperatures are projected to rise from about 25°C to 30°C by mid-century, while annual rainfall increases from roughly 1,138 mm to 1,587 mm. Despite higher rainfall, increased temperatures will accelerate evapotranspiration, leading to greater soil moisture loss and prolonged dry periods during key agricultural seasons. According to the Multi-Sectoral Needs Assessment (MSNA), conducted by **IMPACT Initiatives** in 2024, prolonged dry spells and heavy rains are the hazard types most frequently reported across West Nile and Southwestern regions. With accelerating climate change, they will remain dominant hazards, alongside a growing risk of flash flooding in low-lying and poorly drained areas.[6]

Hazard Type	West Nile	Adjumani	Terego	Koboko	Lamwo	Madi Okollo	Obongi	Yumbe
Drought/Prolonged dry spells	x	31%	39%	40%	46%	31%	36%	46%
Heavy Rains	x	38%	40%	42%	24%	33%	35%	38%
Extreme Temp. Events	x	19%	13%	12%	18%	26%	13%	7%
Flood	x	13%	8%	6%	12%	10%	15%	9%

Table 1: Climate hazards reported in the 2024 MSNA, Northern/West Nile Region

In Southwestern Uganda districts, Isingiro, Kamwenge, Kyegegwa, Kiryandongo, and Kikuube, historical temperatures average about **20.3°C** but are projected to rise to around **26°C** by mid-century, marking significant warming. Annual rainfall is also expected to increase from about **842 mm** to roughly **1,372 mm**.

Hazard Type	South west	Kiryandongo	Isingiro	Kamwenge	Kikuube	Kyegegwa
Drought/ Prolonged dry spells	x	49%	74%	45%	48%	58%
Heavy Rains	x	30%	17%	28%	25%	25%
Extreme Temp. Events	x	16%	6%	23%	18%	13%
Flood	x	6%	3%	4%	9%	3%

Table 2: Climate hazards reported in the 2024 MSNA, Southwestern Region

Across both regions, warmer and wetter conditions do not reduce climate risk. Instead, they increase overlapping hazards, with seasonal droughts, floods, and heat stress occurring in the same districts and seasons. These pressures are especially acute in refugee-hosting areas where land, water, and services are already limited. District-level Climate Hazard Assessments translate national and regional climate trends into local evidence, highlighting key hazards, seasonal risks, and exposures to support targeted planning and resilience for host and refugee communities.

Climate Hazard Assessment– Isingiro District

CONTEXT & RATIONALE

Isingiro District is located in the Western Region of Uganda, bordering Tanzania to the south and Mbarara to the northwest. More specifically, Isingiro is in the Ankole sub-region and therefore positioned in the country's cattle corridor.[7] The district experiences a **bimodal rainfall pattern** with two distinct rainy seasons occurring from March to May and September to November. The dry seasons, characterized by water scarcity, typically occur from December to February and June to August. The district receives an average annual rainfall of 842 mm, which is unevenly distributed, with lower-lying areas in the eastern and southern parts receiving significantly less.[8] The local economy is dominated by small-scale farming and livestock rearing. More specifically, Isingiro is a major hub for banana (matooke) production.[9] Cattle rearing is mostly practiced in the eastern and southern areas characterized by a water-stressed, semi-arid ecosystem.[10] Isingiro District faces increasing climate variability and environmental degradation that compound existing development challenges. The district faces fluctuating rainfall, prolonged dry spells, and declining soil fertility, which undermine agricultural productivity and food security.

Climate projections under the Moderate Socio-economic Path (SSP2-4.5 scenario), which represents a middle of the road development trajectory with moderate emissions and limited climate mitigation, indicate that Isingiro will become warmer and wetter by mid-century. Mean annual temperatures are projected to rise from **20.3°C to 22.8°C,** while annual rainfall is expected to increase from **842 mm to about 964 mm**.[1] Despite this increase in rainfall, intensifying heat stress is expected to pose greater risks to rural households and displaced populations.[11]

As of early 2026, Isingiro hosts **over 280,000 refugees and asylum-seekers**, primarily residing in and around Nakivale and Oruchinga Refugee Settlements.[12][13] The settlement of refugees has **increased pressure on natural resources**, with reliance on wood fuel driving deforestation and rising demand for farmland intensifying land competition, together increasing vulnerability to climate-related shocks. This analysis therefore seeks to generate evidence-based insights into historical and projected climate trends to inform climate-resilient humanitarian and development programming in Isingiro District.

By identifying hazard susceptibility, exposure patterns, and future climate hazards, the assessment aims to support OPM, UNHCR, WFP, district authorities and humanitarian partners in developing targeted interventions, strengthening disaster preparedness and enhancing resilience within one of Uganda's largest refugee-hosting districts.

Key Messages

- Isingiro District currently receives **~842 mm** of annual rainfall, projected to rise moderately to **~ 964 mm** by mid-century under the SSP2-4.5 scenario. However, persistent dry-season deficits and higher evapotranspiration will intensify water stress, especially in areas like Ruborogota, Kikagate and Kashumba.
- Temperatures are projected to increase by **2.2-2.4°C** during the hottest and driest quarters, increasing the risk of droughts, heat stress and the frequency of very hot days across agricultural and settlement areas.
- Seasonal drought remains a dominant hazard, with the Standard Precipitation Index and Vegetation Condition Index (VCI), which capture rainfall deficits and vegetation stress respectively, showing **severe dryness across Masha, Kaberebere Town Council, Kabingo as well as Rushasha, Rugaaga, and Kashumba**, leading to vegetation stress, reduced crop yields, and limited pasture and water availability.
- **Flood** hazard is highly **localized**. Recurrent flash floods mostly affect the western and northeastern parts, where low-lying terrain and poor drainage cause repeated damage to shelter, farmlands, and infrastructure.

[1] SSP2-4.5 refers to a *moderate climate change scenario* that combines the "Middle-of-the-Road" Shared Socio-economic Pathway (SSP2) with a radiative forcing level of 4.5 W/m² by 2100. It assumes continued socio-economic development along current trends, moderate population growth, and limited but ongoing climate mitigation, resulting in continued warming and increasing climate variability.

Location and Topography

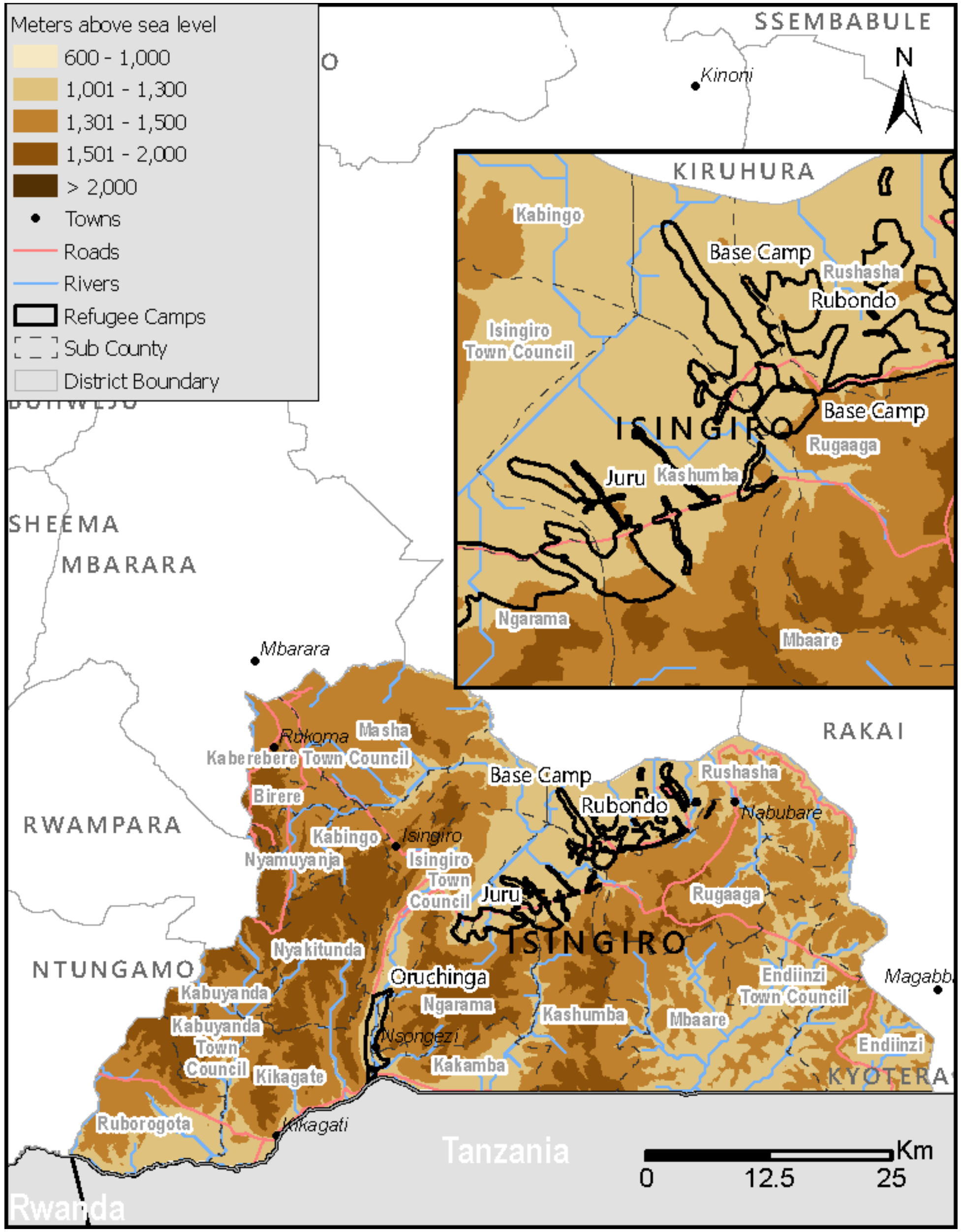
Isingiro District is in the Akole sub-region in the Southwest of Uganda. It is bordered by Mbarara to the northwest, Rakai to the east, and Tanzania to the south. As shown in *Map 1*, Isingiro District is characterized by a **challenging and rugged terrain** consisting of steep, bare hills, deep valleys, and extensive rocky areas with an **average elevation of 1,356 meters**, ranging from 1,1050 meters to 1,902 meters above sea level.[14] The district's topography is dissected by streams, and the area is home to parts of the of the Kagera River drainage basin.

Isingiro's **lower-lying areas** are generally found in the **eastern parts of the district**, and include the sub-counties of Endiizi, Rushasha, and parts of Rugaga. The district's high-altitude areas are primarily located in the western and central parts, with elevations here ranging from 1,200 to over 1,800 meters above sea level.[15] One of the **prominent topographic features** in the district is **Lake Nakivale**, a 26 km^2 water source located within a hilly terrain and serving residents in the Nakivale Refugee Settlement.[16]

The district's varied topography directly shapes its land use and settlement patterns. High-altitude areas are often used for crop cultivation, especially for bananas, coffee and Irish potatoes. These areas offer more reliable rainfall and cooler temperatures than the district's drier lowlands.[17] Settlements here are often dispersed and tend to concentrate in valleys. Featuring rolling hills, natural grasslands, and water sources, the district's lowlands are ideal for livestock rearing and agro-pastoralim.[18] The lowlands in Isingiro District form an integral part of Uganda's cattle corridor, a 84,000 km^2 semi-arid, agricultural region, holding nearly 90% of the country's cattle.[19] Because Isingiro's topography features steep hills that drain into low-lying areas, the district's plains are highly vulnerable to floods, with poor land use practices and environmental degradation further increasing this risk. This underscores the **importance of location-specific planning and risk reduction strategies** to address differential climate sensitivities, including soil moisture deficits, surface runoff, and erosion risks across the district.

Demographics and Population Distribution

According to the 2024 National Population and Housing Census, Isingiro District has a **population of over 635,000 people**, making it one of the most populous districts in the



Map 1: Map showing the Location and Elevation of Isingiro District.

Ankole sub-region.[20] It is primarily inhabited by the Banyakole people, specifically the Bahima and Bairu subgroups, who speak Runyankole. The local economy is dominated by smallholder agriculture and livestock rearing, with significant reliance on banana farming and cattle keeping.[21]

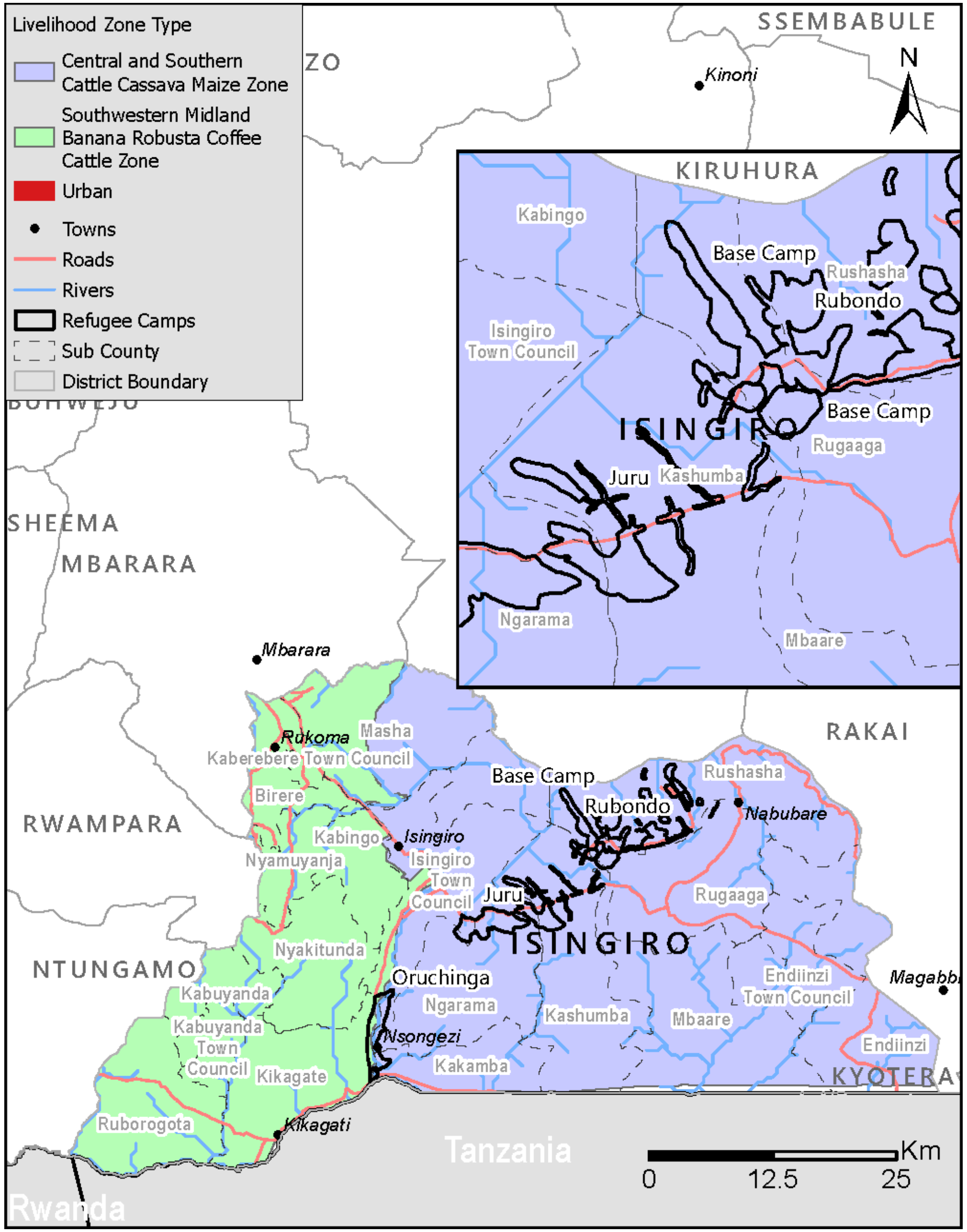
Isingiro District is a **major refugee-hosting area** in Southwest Uganda. The district hosts a large refugee population, mainly from the Democratic Republic of Congo, Burundi, Rwanda and Somalia, primarily residing in and around Nakivale Refugee Settlement and to a lesser extent in Oruchinga Refugee Settlement. As of early 2026, the **refugee population** is estimated to be **281,000 people**.[22] Refugees account for a substantial share of the district's total population, significantly increasing population density in settlement-hosting sub-counties.

This demographic composition has important implications for district planning and climate hazard management. Both host and refugee populations depend heavily on climate-sensitive natural resources and basic services, including land, water, education, health, and sanitation. The high concentration of people in settlement areas intensifies pressure on land, forests, and water resources, **increasing vulnerability to climate-related hazards** such as seasonal droughts, erratic rainfall, and localized flooding.

Livelihoods

The majority of Isingiro District's population depends on **agriculture as the main source of livelihood**, with most households practicing mixed farming systems (see *Map 2*). Crop production is predominantly rain-fed and varies across livelihood zones. The *Central and Southern Cattle Cassava Maize Zone* covers much of the central and southern areas and is characterized by cassava, maize, and cattle production under low and variable rainfall conditions. The *Southwestern Midland Banana Robusta Coffee Cattle Zone* supports banana and Robusta coffee cultivation alongside cattle rearing, benefiting from relatively higher rainfall. In the higher-altitude areas, the *Southwestern Highland Irish Potato Sorghum Vegetable Zone* is dominated by Irish potatoes, sorghum, and vegetable production.

Livestock keeping (especially cattle, goats, and poultry) complements crop production across the district. **Agricultural productivity** is strongly shaped by **spatial variations in rainfall and elevation**. Lower-lying areas, particularly in the central and southern zones, are vulnerable to seasonal droughts and climate shocks that disrupt agricultural cycles and contribute to food insecurity. The southwestern midland and highland zones



Map 2: Map showing Livelihood Zones in Isingiro District.

experience more reliable rainfall and intensive cultivation, but face growing challenges from land pressure, soil erosion, and environmental degradation. Refugee settlements, including Oruchinga, Rubondo and Base Camp, are mainly located in the southern parts of the district within the *Central and Southern Cattle Cassava Maize Zone*. Both refugee and host communities largely rely on small-scale, rain-fed agriculture and livestock rearing, but high population density, limited land access, declining soil fertility, and water scarcity continue to constrain sustainable livelihoods.

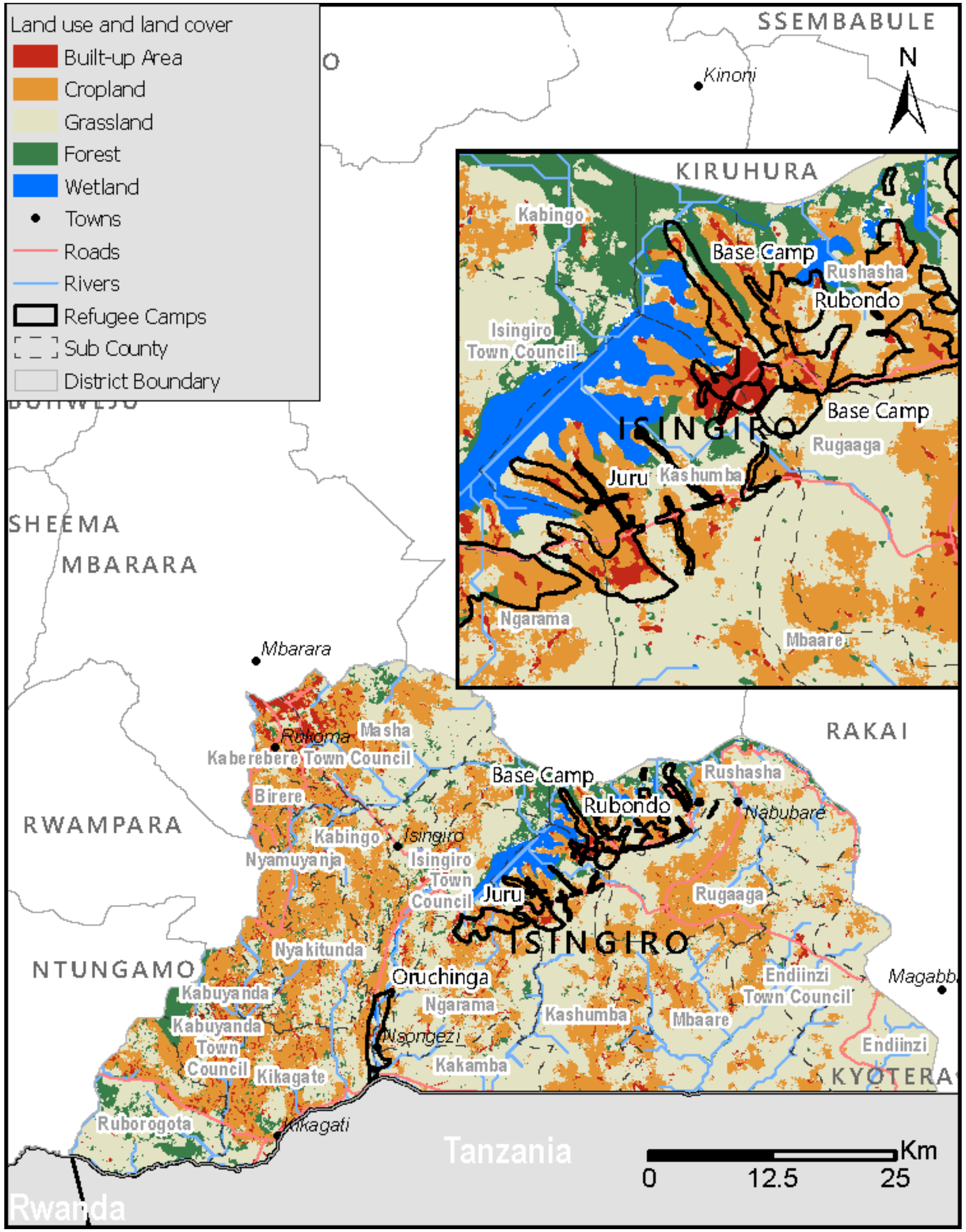
Environment, Land Use and Land Cover

Isingiro District's natural environment is characterized by **rolling hills, rocky ridges and valleys**, with vegetation transitioning from open grassland to denser acacia woodlands. The district is experiencing severe ecosystem degradation, particularly the destruction of wetlands and loss of vegetation cover, primarily driven by agricultural encroachment, climate change-induced droughts, and rapid population growth. The surge in population from 486,000 in 2014 to 635,000 in 2024 has led to **increased demand for land, food, and construction materials**, resulting in **wetland destruction, deforestation and soil erosion and degradation**. Isingiro District faces a severe and chronic water crisis, with up to 67% of residents lacking access to safe water, aggravated by frequent, intense seasonal droughts.[23]

The district increasingly faces climate-related hazards, primarily driven by recurrent seasonal droughts, unpredictable rainfall, and rising temperatures, which had a negative impact on livelihoods. Consequences include **widespread crop failure (notably bananas), acute water shortages, food insecurity and reduced livestock productivity**.

As shown in *Map 3*, Isingiro District's landscape is predominantly composed of grasslands (approximately 54.0%) and croplands (32.38%), reflecting the district's strong reliance on livestock rearing and subsistence agriculture. While these land uses underpin local livelihoods, they also increase sensitivity to climate variability and environmental stress. Forest cover accounts for only about 7.04% of the land area and is largely fragmented around settlements, reducing its capacity to regulate water flow, retain soil moisture, protect catchment areas, and control soil erosion. Built-up areas are closely associated with cropland and wetlands, increasing environmental vulnerability.

Wetlands (1.65%) and open water bodies (0.05%), though limited in extent, play a critical



Map 3: Map showing Land Use and Land Cover in Isingiro District. Source: ESRI land cover map.

role in domestic water supply, livestock watering, dry-season farming, and brick making. However, their intensive use and encroachment by agriculture and settlements, particularly in low-lying areas such as Rubondo, have reduced their natural flood-buffering and water-storage functions. During periods of heavy rainfall, this has increased exposure to seasonal flooding, while during dry periods, degradation of wetlands further constrains water availability.

CLIMATE CONTEXT

This section presents an analysis of Isingiro District's climate using key indicators. Rainfall and temperatures are examined from both historical records and future climate projections to understand long-term trends and emerging risks of the hazards associated with them. The aim is to provide a clear picture of how climate patterns have evolved over time and how they are expected to change in the coming decades, informing both vulnerability profiling and resilience planning.

Rainfall

Isingiro District experiences a **bimodal rainfall pattern** with two main rainy seasons (March-May and September-November) and two dry seasons (December-February and June-August), as can be seen from the long-term average rainfall patterns (1981-2024) shown by the dashed line in *Figure 1*. The **driest months** remain **June, July and August**, each typically receiving less than 50 mm of rainfall. **Year-to-year variation** is also evident, with 2022, 2023, and 2024 showing different magnitudes and timing of rainfall within these general seasonal patterns. As shown in *Figure 1*, recent observations (2022-2024) reveal year-to-year variability in both the timing and amount of rainfall compared to historical averages. For example:

- 2022: Rainfall was generally closely following the 1981-2024 average. That said, February and especially April recorded totals above the long-term mean.
- 2023: Rainfall departed more strongly from the 1981-2024 average, with July recording hardly any rainfall at all, and below average totals in August and February. September, November and December were clearly wetter than the long-term mean.
- 2024: Rainfall fluctuated around the 1981-2024 average, with below average totals in March and August whereas April and especially November recorded clearly above average rainfall.

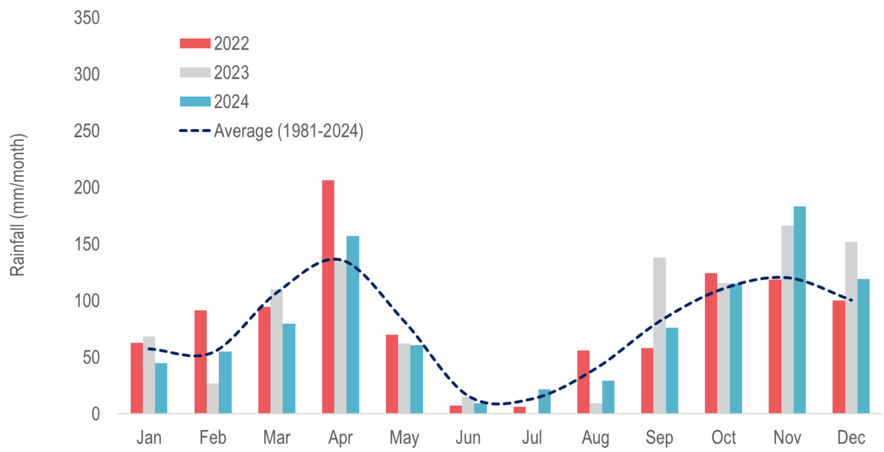


Figure 1: Graph showing Long-term Average Rainfall (2022-2024) in Isingiro District.

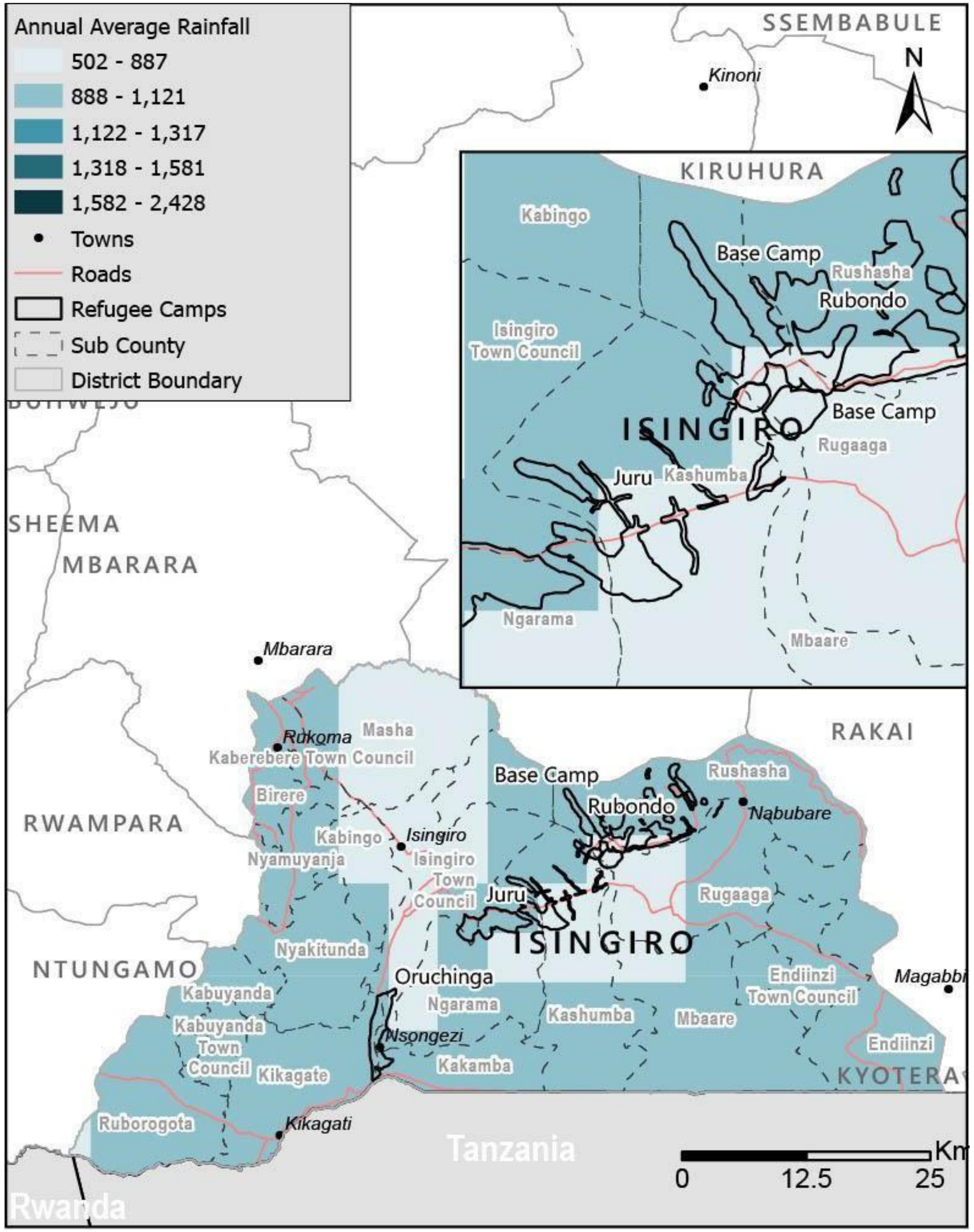
These fluctuations are influenced by climate variability phenomena, such as the El Niño Southern Oscillation (ENSO), which can alter the onset, duration, and intensity of seasonal rains. Historically, the El Niño Southern Oscillation (ENSO) typically occurred in an irregular cycle of two to seven years, with the individual El Nino persisting for 9 to 12 months. In recent decades, greater variability in ENSO timing, intensity and impacts has contributed to less predictable rainfall patterns across the region and as a result, Isingiro is increasingly vulnerable to both seasonal droughts and flooding. Prolonged dry spells, especially during the June-August period, lead to water scarcity, crop stress, and pasture depletion. Conversely, intense rainfall events during the two main rainy seasons (March-May and September-November) can trigger flash floods, crop damage, and disruption of transport and livelihoods.

Overall, Isingiro District is frequently impacted by **unreliable rainfall patterns** and **extreme seasonal droughts**. The area often experiences delayed onset of rain, unpredictable breaks in the rainy seasons, and relatively low total precipitation. Some areas receive annual rainfall of around 1,200 mm, but with high variability, while others are lower, bordering on semi-arid conditions.[24]

The increasing variability in rainfall patterns combined with the district's reliance and rain-fed agriculture and pastoralism have heightened climate risks for both refugees and host communities. Recurrent extreme weather events, mostly in the form of intense and prolonged dry spells, have a negative impact on agricultural productivity and livestock, threatening the livelihoods of inhabitants. This underscores the urgent **need for integrated climate adaptation and resilience strategies** to safeguard water availability, food security and sustainable livelihoods.

Map 4 displays the spatial distribution of average annual rainfall across Isingiro for the period 1981-2024, derived from long-term CHIRPS precipitation data. Isingiro District straddles the **502-887 and 888-1,121 mm annual rainfall zones**, with higher elevation areas experiencing more rainfall compared to the lower-lying, drier parts, such as Masha, Mbaare, Endiinzi, and parts of Birere. **Rainfall in Isingiro is increasingly insufficient to reliably sustain rain-fed agriculture**, even in high-altitude areas. This is due to high climate variability, unreliable rainy seasons, and frequent seasonal droughts.[25]

Located within Uganda's dry cattle corridor, Isingiro exhibits an extremely high susceptibility to seasonal droughts.[26] Over the last decade, rainfall has become more unreliable, leading to more frequent dry spells, affecting both agricultural and pastoral livelihoods. Seasonal rainfall variability often drives environmental degradation-such as soil erosion, soil nutrient loss and water availability which in turn disrupts traditional agricultural calendar (the timing of planting, growing and harvesting). Overall, the increasing variability in rainfall patterns, coupled with the district's reliance on rain-fed agriculture, heightens climate risks for both refugee and host communities. For example, bananas, one of the main sources of livelihood in the area,[27] are a highly vulnerable crop: even a short dry spell can negatively impact their growth and yield.[28] Isingiro District is also a major area for cattle farming. That said, cattle can generally survive only 3 to 7 days without water before suffering severe dehydration, stress or death.[29] During peak dry season in July, Isingiro has an average of only 3.6 days of precipitation, implying that there is little to no rainfall the rest of the month. This increases the risk for complete crop failure and livestock death.



Map 4: Map showing Average Annual Rainfall (1981-2024) of Isingiro District.

In recent years, **complete banana crop failures** have become more common, particularly in areas like Bukanga County. Farmers reported irreversible damage to banana plantations as a result severe, prolonged dry spells. Those affected face food insecurity and heightened poverty risks. Pastoral livelihoods are equally affected. In 2016, Isingiro experienced a devastating livestock crisis, causing hundreds of cattle, goats, and sheep to die due to lack of pasture and water.[30]

The recent changes pose **specific challenges for refugee-hosting areas**. Nakivale and Oruchinga Settlements, both located in semi-arid ecological zones, are prone to recurrent seasonal droughts and depend heavily on predictable seasonal rains to sustain small household gardens. When rainfall becomes erratic and unpredictable, refugees have fewer livelihood alternatives to buffer these shocks, causing significant on natural resources like Lake Nakivale. As a result of overcultivation and overgrazing, soils in and around the settlements are already severely degraded and depleted of fertility, making **agricultural productivity low**.[31] Overall, this makes refugee communities more vulnerable than host communities whose livelihoods are distributed across a wider landscape and diversified through larger landholdings and livestock.

It is the increasing variability and rapid shifts in the known climatic patterns that pose growing risks in Isingiro. These shifts influence water availability, crop performance, pasture regeneration and the reliability of rain-fed farming systems that both host and refugee communities depend upon.

Temperature

Over the past four decades, Isingiro District has experienced a significant rise in temperatures, with an **increase of approximately 2.2 to 2.6°C**, a substantial warming trend for a single district. As shown in the graph in Figure 2 the most pronounced rise has occurred in recent years (2015-2024), albeit also with greater year-to-year variability in temperatures.

The long-term temperature trend can be summarized as follows:

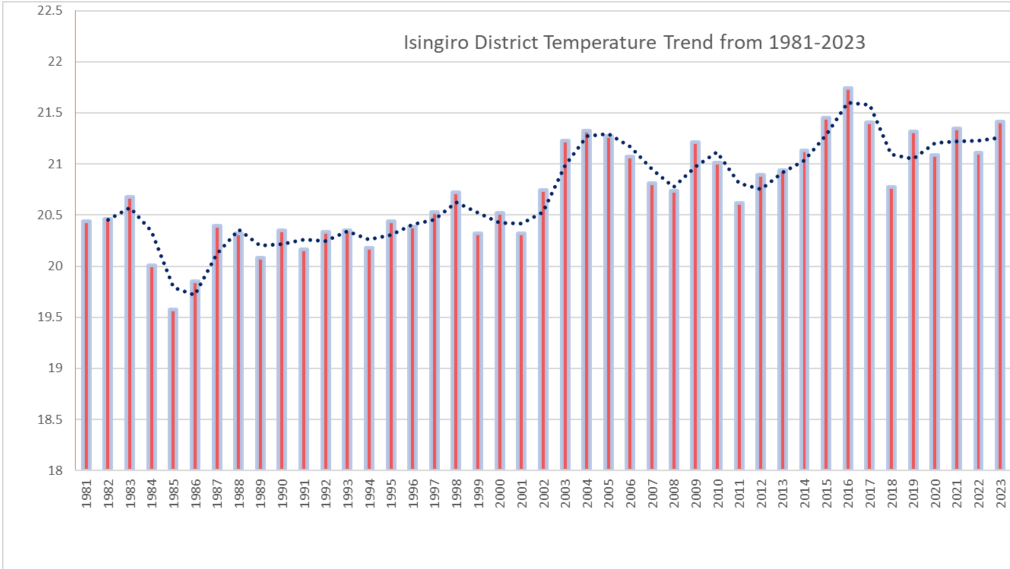


Figure 2: Graph showing the long-term temperature trend (1981-2023) in Isingiro District.

- 1980s-mid 1990s: Average annual temperatures generally ranged between about 23.9°C and 24.8°C, with modest year to year variability and no strong warming trend.
- Late 1990s-2014: Average annual temperatures rose gradually to between approximately 24.8°C and 25.5°C but remained relatively consistent until 2014.
- 2015 onwards: A clearer warming signal and greater variability, with most years above 25.5°C and peaks approaching 26°C-26.5°C, followed by an exceptional spike above 27°C in 2023.

The rise in temperatures coupled with greater variability highlights the **growing climate stress in the region**, with implications for agriculture, water availability, health and overall resilience.

In Isingiro, the warmer periods generally coincide with the transition into the rainy seasons. The hottest temperatures typically occur during the drier, sunny periods immediately preceding the two main rainy seasons (March-May and September-November). February is often considered one of the hottest months before the March/Aprils rains start. The graph in *Figure 3* indicates a rise in temperatures, with recent years showing more days where average daily temperatures exceed the long-term mean. This suggests that hotter-than-normal years are becoming more frequent, increasing heat stress on crops, pasture, livestock and water resources. These emerging extremes, coupled with rising seasonal temperatures, highlight Isingiro district's growing vulnerability to climate-induced heat stress.

The long-term monthly temperature average (2022-2024) shown by the dashed line in *Figure 3,* indicates temperature rises leading up to or within the rainy seasons that coincide with crop flowering (April/May and October/November) and crop germination (February/March and August/September).

The recent monthly temperature trend (2022-2024) can be summarized as follows:

- 2022: Monthly temperature in the crop flowering stage was above normal of the long-term average in May and October.
- 2023: Monthly temperature in the crop flowering stage was above normal of the long-term average in May and October while it was below normal in March-April.
- 2024: Monthly temperature in the crop flowering stage was generally above normal of the long-term average, from April/May to October.

Above-normal temperatures negatively affect crops at all stages-reducing,

- germination by accelerating metabolism leading to depletion of energy reserves, impairing starch breakdown and causing poor root development before seedlings establish.
- flowering by hindering pollination, fertilization, and impairing chlorophyll function, thus lowering carbohydrate supply and leading flowers to drop prematurely.
- seed development by reducing carbohydrate and oil accumulation in seeds, resulting in smaller seeds and thus lowering the seed germination potential of harvested seeds.

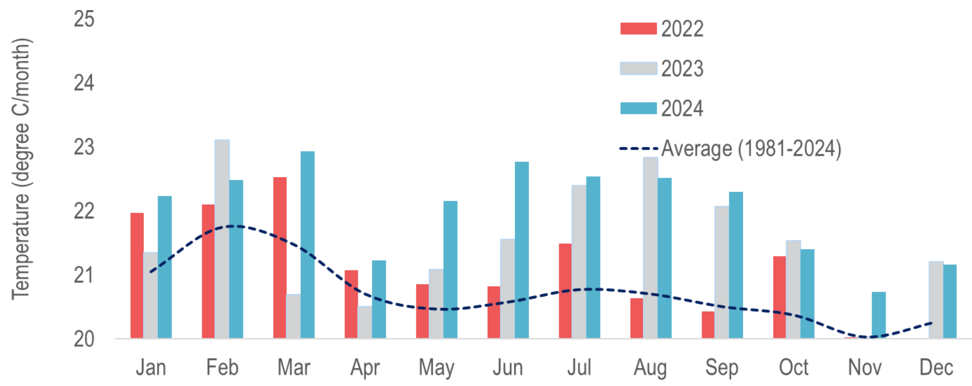


Figure 3: Graph showing Average Annual Temperature (2022-2024) of Isingiro District.

In short, heat stress is most damaging during flowering and seed development. Farmers might mitigate heat stress effect through adjusted sowing dates, use of heat-tolerant varieties and irrigation scheduling.

CLIMATE CHANGE PROJECTIONS

In this study, bioclimatic variables from WorldClim v2.1, which provide historical high-resolution baseline climate data, such as temperature and precipitation patterns, were compared with future climate projections generated by the UKESM1-0-LL Earth system model under the SSP2-4.5 scenario, a "middle-of-the-road" pathway. Under this scenario, socio-economic development and moderate mitigation policies lead to stabilizing greenhouse gas emissions. This comparison allows researchers to assess how key climatic factors like seasonal rainfall, temperature extremes, and drought indices are expected to shift in coming decades, highlighting potential impacts on ecosystems, agriculture, and water resources under a moderately warming future.

Precipitation changes (1970-2000 vs 2041-2060)
SSP2-4.5 Moderate Emission Scenario
Annual precipitation changes

+122 mm

Temperature changes (1970-2000 vs 2041-2060)
SSP2-4.5 Moderate Emission Scenario
Annual Mean Temperature Increase

+2.56 °C

Figure 1: Annual precipitation and temperature changes in Isingiro District

Temperature

The mean annual temperature is projected to rise from **20.3°C** in the historical baseline to **22.8°C** by **2041-2060.** Both minimum and maximum temperatures show substantial increases. The strongest warming (up to **2.61-2.63°C**) is expected in **Ruborogota, Kabuyanda Town Council, Kabuyanda and Kikagate**.

An increase in mean temperature during both the **warmest months (+2.2°C)** and **driest quarter (+2.4°C)** indicates more intense heatwaves particularly during already dry periods. This combination heightens **heat stress for people, crops and livestock, greater evapotranspiration, and reduced soil-moisture retention**.

An increase in mean temperature during both the **coldest months (+3.1°C)** and **wettest quarters (+2.6°C)** indicates a **general warming across seasons**, including periods that are typically cooler. This suggests reduced seasonal cooling and more persistent heat throughout the year.

These impacts pose challenges for **crop production, livestock, and human health** particularly in areas with limited vegetation cover, including parts of Nakivale and Oruchinga settlement.

+ 2.2 ^{0} C — *Increase in mean temperature in the warmest month*

+ 2.4 ^{0} C — *Increase in mean temperature in the driest quarter*

+ 3.1 ^{0} C — *Increase in mean temperature in the coldest month*

+ 2.6 ^{0} C — *Increase in mean temperature in the wettest quarter*

Figure 5: Projected changes in temperature in bioclimatic variables.

Precipitation

Mean annual rainfall is projected to increase from **842 mm to 964 mm** by mid-century. However, the distribution of rainfall gains is uneven across the district. The largest precipitation increases **(129-133 mm)** are expected in **Birere, Kaberebere Town Council and Endiinz,** while areas such as **Ruborogota, Kikagate and Kashumba** show smaller increases (115-118mm).

An Increase in precipitation of the **wettest month (+13.7 mm)** and **coldest quarter (+100.8 mm)** indicates intensifying rainfall during already wet and cold periods. This may lead to more frequent and intense floods, waterlogging, with potential impacts on agriculture, settlements and access to services.

+ 13.7 mm — *Increase in precipitation of the wettest month*

+ 43.2 mm — *Precipitation of the warmest quarter*

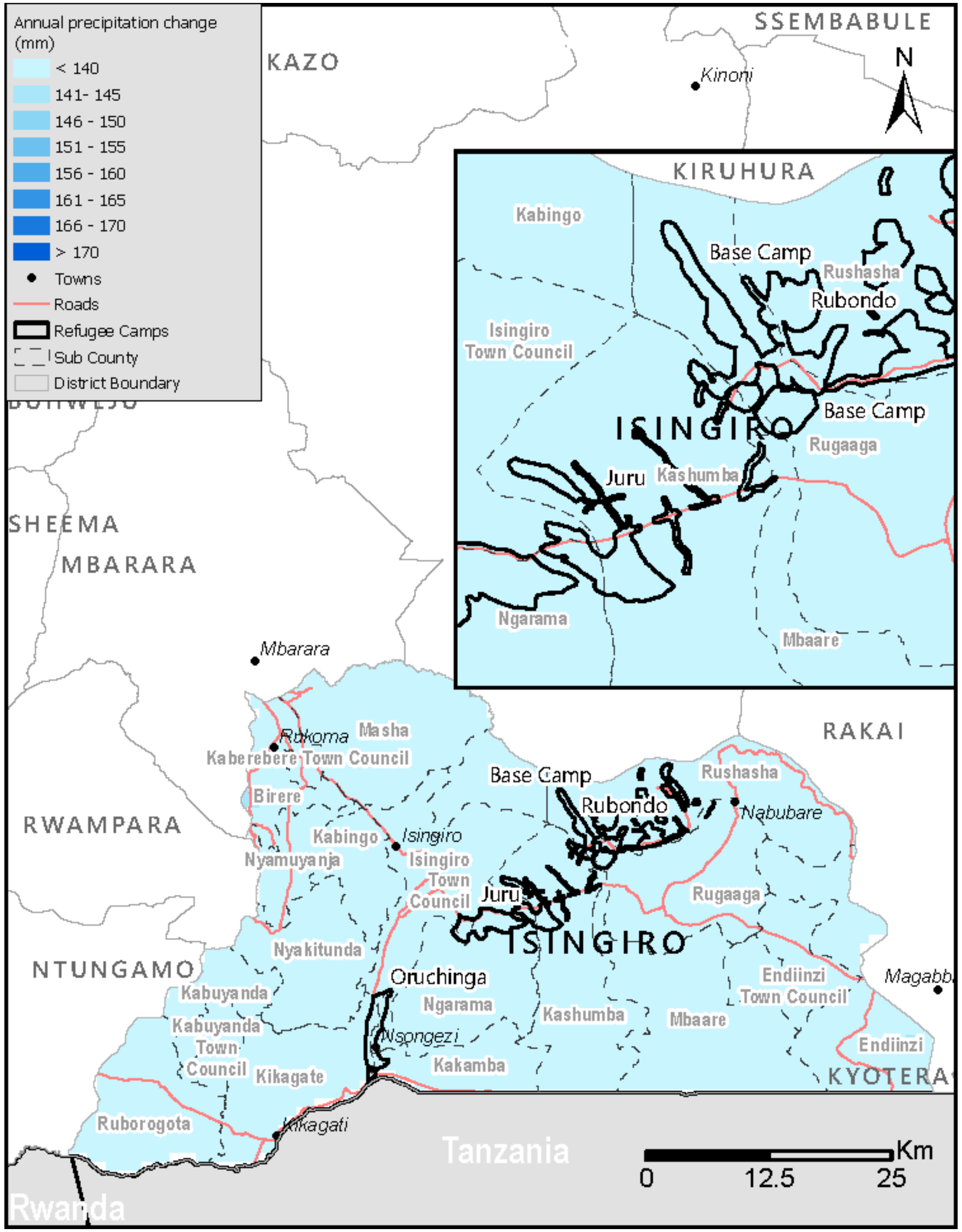
+ 0.3 mm — *Increase in precipitation of the Driest month*

+ 100.8 mm — *Precipitation of the coldest quarter*

Figure 6: Projected changes in precipitation in bioclimatic variables

An increase in precipitation during the **driest month (+0.3 mm)** and the **warmest quarter (+43.2 mm)** indicates **a shift toward wetter conditions outside the traditional rainy season**, suggesting more evenly distributed rainfall across the year. This means dry-season water scarcity will persist, even under wetter annual conditions. This change **reflects increasing seasonal variability, with implications for agricultural planning, water management, and flood risk during periods that were previously drier or hotter.**

Rainfall seasonality also remains largely unchanged, continuing Isingiro's district's



Map 5: Map showing Projected Precipitation Changes from the Baseline (1970-2000) to the Near Future (2041-2060).

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dependence on two distinct rainy seasons. That said, these seasons become increasingly unpredictable in their timing and intensity.

Implications

The combination of rising temperatures, changes in dry-season rainfall, and moderate increases in annual precipitation creates a complex climate-hazard profile for Isingiro District. **Increased evapotranspiration may reduce the benefits of higher annual rainfall, limiting improvements in soil moisture and water availability.** Areas with fragile vegetation cover or high settlement density, such as certain zones within Nakivale and Oruchinga Refugee Settlements, are likely to face rising exposure to heat stress, seasonal drought and water scarcity.

South-eastern and north-western Isingiro, which already experiences drier conditions, may face heightened vulnerability to climate-related shocks compared to the rest of the district which receives larger rainfall gains. These shifts have significant implications for agriculture, livestock production, water systems, and community resilience.

These projections align closely with broader national and East African climate patterns. According to the Uganda Third National Communication to the UNFCCC[32] and the IPCC Sixth Assessment Report[33], temperatures across Uganda are expected to rise by 1.5-2.5°C by mid-century, while rainfall is projected to increase with greater variability and intensity. The projected warming and rainfall changes observed in Isingiro District fall within these ranges, indicating that the district is experiencing climate shifts consistent with regional trends.

This comparison reinforces the need for targeted adaptation measures, as increased rainfall intensity, elevated flood risk, and intensified heat stress may further affect agriculture, water resources, and overall livelihood resilience.

SEASONAL DROUGHT HAZARD ASSESSMENT

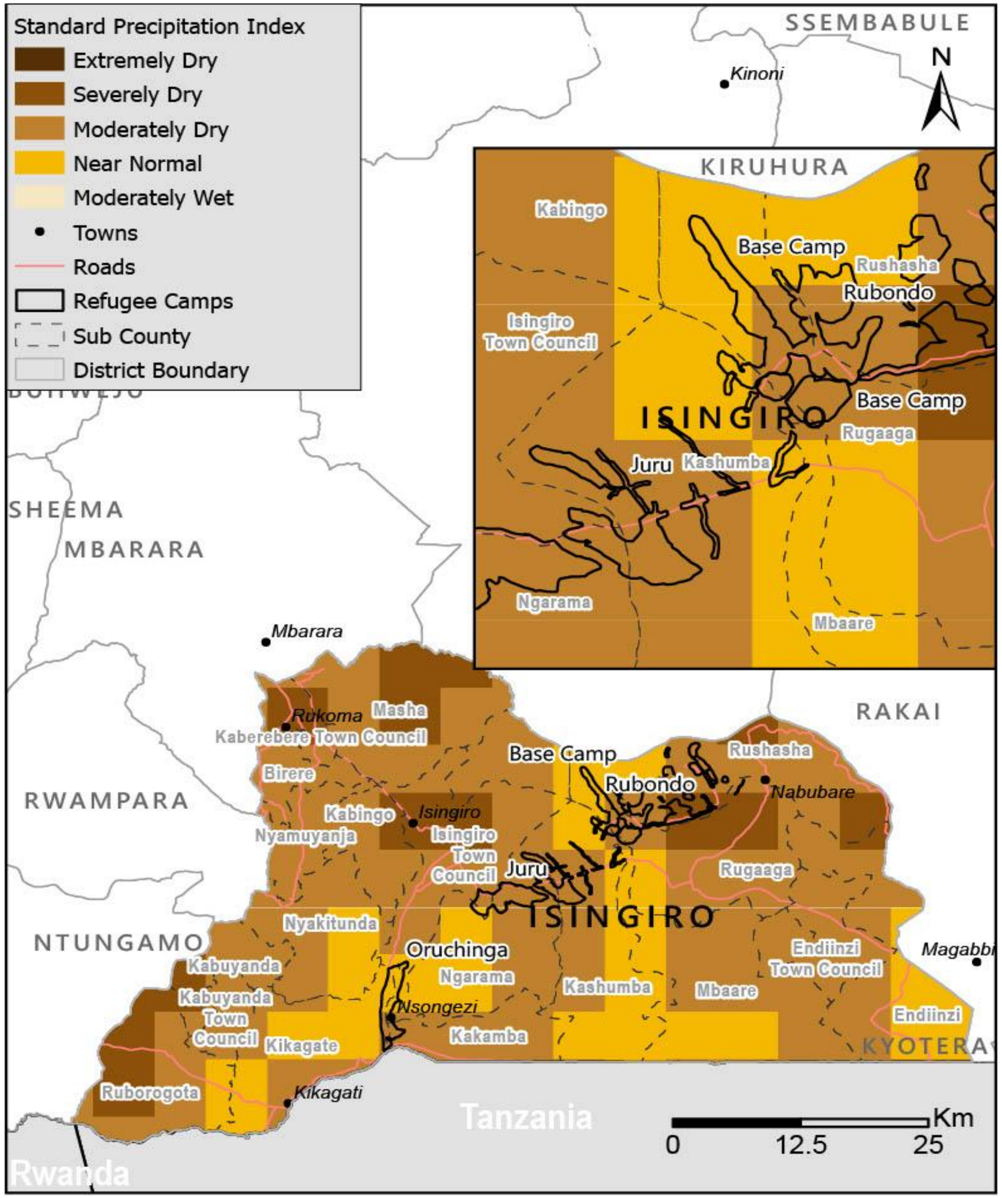
Isingiro District is increasingly at risk of seasonal drought due to unpredictable rainfall, long dry periods, and rising temperatures, which threaten farming and household livelihoods in this mostly rain-fed area. Both host and refugee communities, including those living in Base Camp, Rubondo, Juru, and Oruchinga Settlements, frequently experience dry spells and stress on crops and natural vegetation caused by lack of water. These conditions disrupt planting, reduce harvests, and increase food insecurity.

This analysis applies the *Standardized Precipitation Index (SPI)***,** a precipitation-based indicator that measures precipitation/rainfall anomalies by comparing observed rainfall to historical averages and the *Vegetation Condition Index (VCI),* an NDVI2[2] based indicator that shows crop biomass and vegetation health responses to precipitation anomalies/moisture stress. These indices capture both meteorological drought conditions and their impact on vegetation, providing an integrated understanding of drought occurrence and severity.

The effects were particularly severe in 2024, when prolonged drought conditions affected northern, southern, western, and eastern parts of Isingiro District, including areas hosting refugees in Base Camp, Rubondo, Juru, and Oruchinga Settlements, resulting in crop failures, water shortages, and increased vulnerability for both host and refugee communities. While humanitarian partners provided some emergency support, limited resources and logistical challenges highlighted the district's urgent need for long-term investment in seasonal drought preparedness, climate-resilient agriculture, water management, and adaptation strategies.

SPI Findings

Central parts of the district, including Ngarama, Juru, and Kashumba, **experienced severely dry to moderately dry conditions**, indicating widespread moisture stress affecting both crop production and pasture availability. The **eastern areas** bordering Rakai and Kyotera districts are predominantly **severely dry**, with isolated patches of moderately dry conditions, while the northern parts bordering Kiruhura show a mix of severely dry, moderately dry, and limited near-normal conditions**Refugee-hosting**



Map 6: Map showing the SPI Index.

[2] NDVI stands for the Normalized Difference Vegetation Index.

areas, including Base Camp, Rubondo, and Nakivale, are largely located within **severely dry zones**, highlighting heightened risks of water stress for both refugee and host communities. Near-normal conditions are limited and occur only in small pockets within the south-central and northern parts of the district.

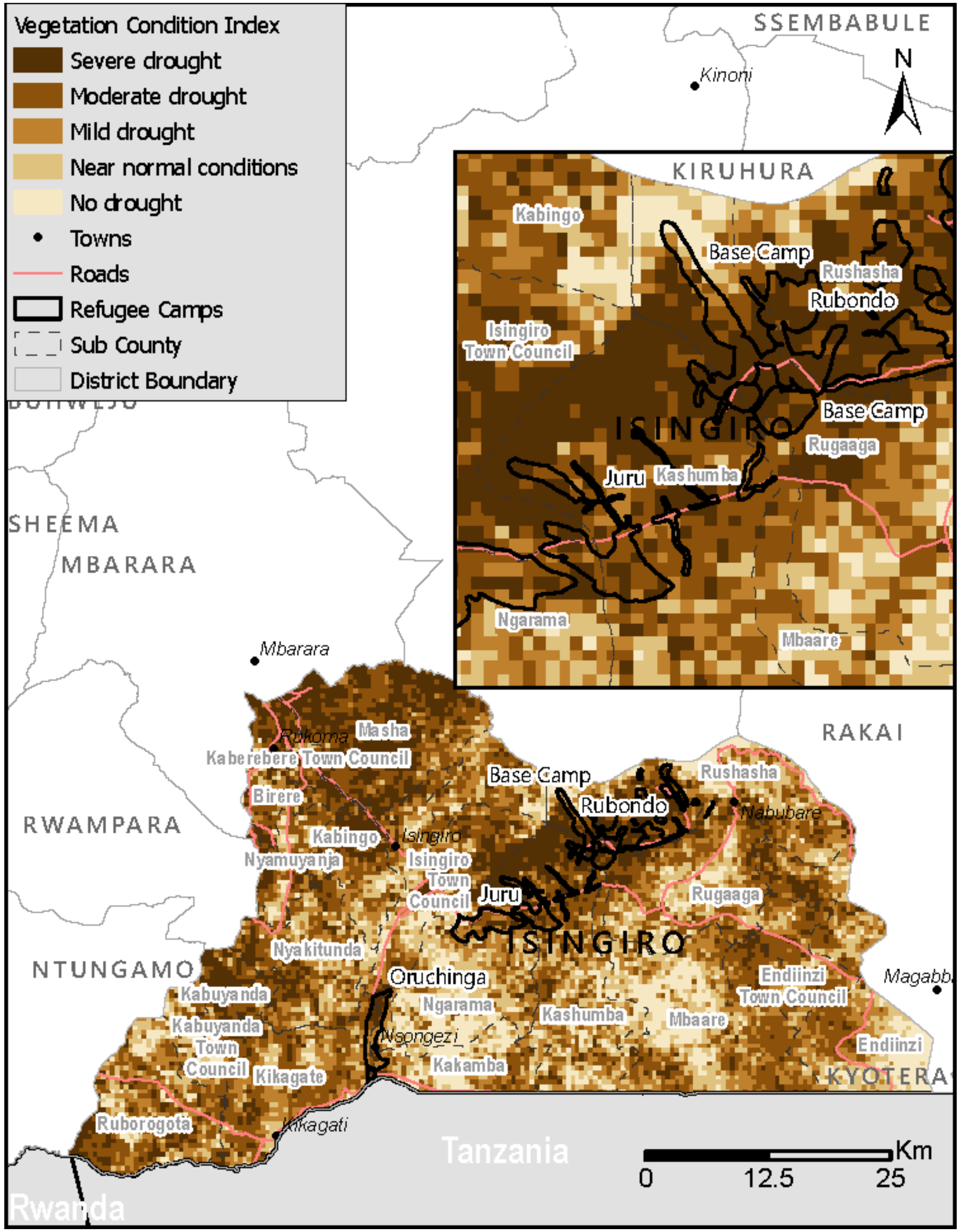
The SPI pattern indicates **substantial impacts on soil moisture** availability, crop performance, rangeland conditions, and water access across Isingiro District. The concentration of seasonal drought conditions in agriculturally dependent and settlement-hosting areas underscores the high vulnerability of livelihoods that rely heavily on rain-fed systems and limited water resources (see *Map 6*).

VCI Findings

The *Vegetation Condition Index (VCI)* results confirm **widespread vegetation stress** across Isingiro District in March-May 2024, corresponding closely with the SPI-detected rainfall deficits. Grasslands provide the clearest and most reliable signal of drought severity because they are shallow-rooted and are highly sensitive to rainfall variability. Croplands follow depending on crop type and seasonal calendar timing shifts, forests mask short-term drought because they have deeper root systems and higher biomass, and built-up areas give misleading signals because of bare surfaces and less green vegetation. The **most affected areas** in Isingiro District include the northern, southern, western, and eastern parts of the district. Sub-counties such as **Masha, Kaberebere Town Council, Kabingo in the northwest,** as well as **Rushasha, Rugaaga, Kashumba, Kabuyanda, and Ruborogota** show moderate to severe vegetation drought, represented by the darker brown tones on the map in *Map 7*.

All refugee settlements fall within areas classified as having moderate to severe vegetation drought. These patterns reflect reduced vegetation vigour, declining pasture availability, and early signs of crop failure.

Meanwhile, limited pockets in the eastern and central parts of the district exhibit mild to moderate vegetation drought or near-normal vegetation conditions, indicating relatively better environmental performance compared to the most affected areas. The VCI map in *Map 7* demonstrates a notable eastward intensification of vegetation drought, consistent with the spatial distribution of rainfall deficits



Map 7: Map showing the VCI Index.

Overall, the findings illustrate that vegetation health across much of the district, including areas hosting refugee populations, was significantly constrained during this period, affecting croplands and grazing areas crucial for the livelihoods and food security of both host and refugee communities.

Implications

The combined SPI and VCI analyses provide a comprehensive picture of seasonal drought dynamics in Isingiro District, revealing a strong linkage between rainfall deficits (meteorological drought) and declining vegetation vigour (agricultural drought). The simultaneous occurrence of severe SPI dryness and moderate to severe VCI values in the northern, southern, western, and eastern parts of the district, including sub-counties such as Masha, Kaberebere Town Council, Kabingo, Rushasha, Rugaaga, Kashumba, Kabuyanda, and Ruborogota, indicates that these areas face **acute vulnerability during short-term rainfall deficits. All areas hosting refugee populations also fall within zones of severe seasonal drought and vegetation stress, highlighting heightened livelihood risks.**

These climatic stressors have tangible consequences. In 2024, severely dry to moderately dry conditions during critical planting and grazing periods constrained crop production, reduced pasture availability, and limited water access for both host and refugee communities. Rainfall deficits and erratic precipitation have impaired growth of staple crops such as maize, beans, cassava, and vegetables, with early signs of crop failure emerging in the most affected areas. These agricultural challenges directly reflect the combined SPI and VCI signals, reducing food availability, household income, and resilience.

The impacts extend across multiple livelihood dimensions. Low soil moisture and weakened vegetation cover undermine crop yields, pasture regeneration, and water resources, while also increasing soil erosion and land degradation, weakening the district's ecological resilience to future shocks. The pressure is amplified in settlement areas, where high population density and limited access to natural resources magnify seasonal drought impacts on both refugees and host communities.

From a preparedness and response standpoint, the findings emphasize the **need for early warning systems, climate-smart agriculture, water harvesting and storage, and strengthened natural resource management**. Integrating SPI and VCI monitoring into district-level disaster risk management frameworks can support evidence-based planning, timely alerts during emerging drought episodes, and more effective resource allocation for both immediate interventions and long-term climate resilience across Isingiro District.

Photo 1: Farmers in Isingiro Grapple with Drought as Crops Wither Martin Okudi; Photo Credit; Bridget Nsimenta

In September 2024, farmers in Isingiro District faced severe seasonal drought, which devastated crops and caused widespread financial hardship. Banana plantations, a major source of income in the district, were particularly affected. Local farmers, including those in Kabagabe Village, expressed frustration over failed crops and wasted resources due to prolonged dry spells. The Resident District Commissioner, Nasiima Adah, highlighted the importance of micro-scale irrigation to mitigate drought impacts, emphasizing that water availability could sustain agriculture year-round. The district also introduced new technologies and training programs to help farmers adopt sustainable and climate-resilient agricultural practices.

Source: Nilepost -farmers-in-Isingiro-grapple-with-drought-as-crops-wither

FLOOD HAZARD ASSESSMENT

Flood susceptibility refers to how likely an area, community, or system is to experience harmful impacts from flooding, based on physical, environmental, and socio-economic factors.
Several factors determine how an area exposure to flood is ranked from low to high. These factors include hydrological (e.g. intensity and duration of rainfall), geographical (proximity to rivers, soil type, and topography), land use and community livelihood types.

For this assessment thirteen indicators were analysed by ranking into five score levels to flood susceptibility. The score rank of the thirteen indicators was summed and ranked into three levels of susceptibility.[34]

1. Distance to Permanent water ranked from higher to lower susceptibility at 100 meters, 250 meters, 500 meters, and 750 meters.[35]
2. Elevation above sea level ranked from higher to lower susceptibility at 600 meters, 700 meters, 800 meters, and 1000 meters.[36]
3. Slope of the area in degrees ranked from higher to lower susceptibility at 2, 5, 10, 15.[33]
4. Landcover from higher to lower susceptibility as built-up, cropland (including water, flooded vegetation), grassland, shrub and forest.[37]
5. Topographic Position Index ranked from higher to lower susceptibility at -8, -6, -4, - 2, 0.
6. Normalized Difference Vegetation Index (NDVI) ranked from higher to lower susceptibility at 0.2, 0.4, 0.6, 0.8.[38]
7. Normalized Difference Water Index (NDWI) ranked from higher to lower susceptibility at 0.6, 0.2, -0.2, -0.6.
8. Flood Return period ranked from higher to lower susceptibility at 10 years, 20 years, 50 years, 100 years, 200 years.[39]
9. Rainfall Intensity as average maximum annual rainfall ranked from higher to lower susceptibility at 33 mm, 31 mm, 29 mm, 27 mm.[40]
10. Monthly Number of Days with Rainfall ranked from higher to lower susceptibility at 13 days, 10 days, 7 days, 3 days.[41]
11. Frequency of -days with continuous Rainfall ranked from higher to lower susceptibility at 2, 1.2, 0.8, 0.4.[42]
12. Height Above Nearest Drainage (HAND) ranked from higher to lower susceptibility at 2 meters, 5 meters, 10 meters, 20 meters.[43]
13. Soil texture ranked from higher risk to lower risk with (clay, clay loam, silty loam), (silty clay, silty clay loam), (sandy clay, sandy clay loam), (loam, sandy loam), (loamy sand, sand).[44]

Flood susceptibility mapping relies on integrating multiple environmental, hydrological, and climatic indicators to assess prone zones. Recent literature emphasizes that parameters such as proximity to water bodies, elevation, slope, land cover, vegetation indices, and rainfall characteristics are critical determinants of flood vulnerability. Studies highlight that areas closer to permanent water sources, with low elevation and gentle slopes, are more prone to inundation. Similarly, built-up and cropland land covers tend to amplify flood susceptibility due to reduced infiltration capacity, while vegetation indices (NDVI, NDWI) provide insights into soil moisture and vegetation health, which influence runoff and water retention. The inclusion of topographic indices like HAND and TPI further refines susceptibility mapping by capturing micro-topographic variations that affect drainage and water accumulation

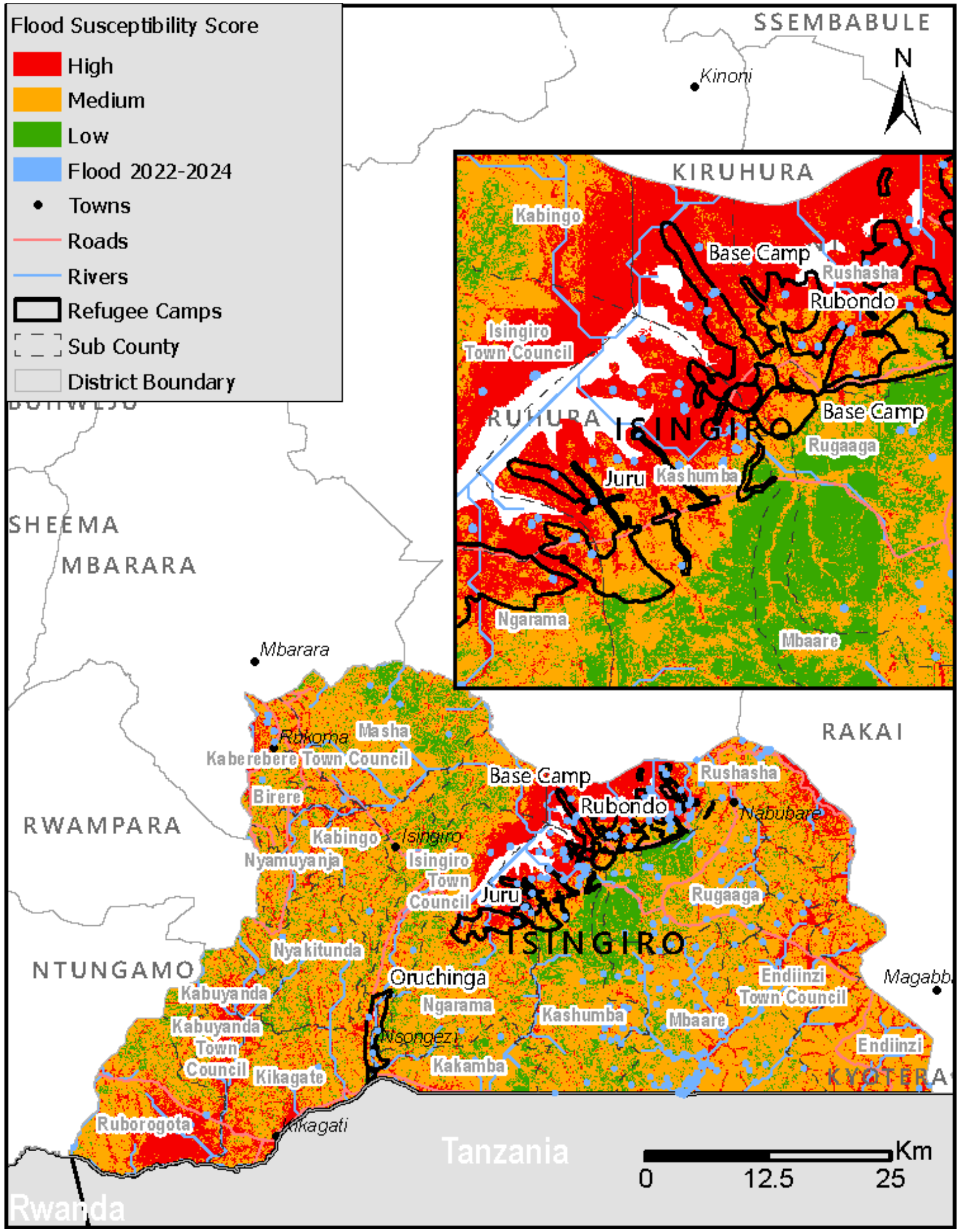
Hydro-climatic indicators such as rainfall intensity, frequency of continuous rainfall days, and flood return periods are equally vital in flood risk assessment. Literature shows that extreme rainfall events, particularly when sustained over consecutive days, significantly increase flood hazards. Soil texture also plays a crucial role, with clay-rich soils exhibiting lower infiltration rates and higher runoff potential compared to sandy soils. Integrating these thirteen indicators into a composite scoring system aligns with established frameworks that rank susceptibility into multiple levels. Such multi-criteria approaches are widely recommended because they capture the complex interplay between terrain, hydrology, and climate, thereby improving the accuracy of flood hazard mapping and supporting disaster risk reduction strategies.

Findings

Several geographic and infrastructural factors exacerbate flood risks in the district. Isingiro District has predominantly flat terrain with clayey soils. Insufficient drainage infrastructure limits water infiltration and increases surface runoff, particularly in low-lying areas and along seasonal streams and permanent rivers.

Satellite-based assessments reveal that **19.4%** of Isingiro District falls into **high-susceptible flood areas.** Its hilly terrain with deep valleys makes it prone to flash floods and landslides. Although Rushasha, Isingiro Town Council, Ruborogota, Kashumba and Ngarama can be categorized as sub-counties with high flood suspectiblity according to *Map 8*, there were no recorded flood incidents in the last 20 years. That said, **Kabuyanda and Birere are sub-counties that have experienced floods**. Their vulnerability stems from low elevation and proximity to seasonal river channels. In terms of the refugee settlements in Isingiro, Nakivale is more susceptible to flooding than Oruchinga due to its proximity to wetlands. These zones are situated on gently sloping terrain that accumulates runoff during peak rainfall periods, resulting in repeated damage to shelters, latrines and access roads. Such events disrupt humanitarian operations and pose significant public health risks, including water contamination.

The flood susceptibility analysis for Isingiro District (2022-2024) in *Map 8* shows that **flooding is highly localized, with the greatest concentration of inundation occurring in the northeastern and western parts of the district.**



Map 8: Map of Isingiro District showing Flood Susceptibility (2022-2024).

Risk on Cropland and Settlement

The land cover analysis revealed that grassland covers 54.6%, forest 7.1%, built-up areas 4.9%, while cropland covers 32.4%. 16.2% of cropland falls within the high-risk flood zone, while at least 38.6% of built-up areas are within the high-risk flood zone. Built-up areas emerge as the most affected by flooding when measured in terms of the area inundated compared to cropland. However, these estimates represent district-wide averages. Therefore, they conceal substantial spatial concentration of impacts at the local level.

The *Land Use and Landcover Map* (*Map 3*) shows that cropland cells are more evenly distributed within the district, falling within low- to high-risk flood zones, pointing to chronic exposure for households cultivating around floodplains and poorly drained depressions. For households in flood-prone areas, localized flash flooding events can result in crop damage, delayed planting, and yield losses, likely to contribute to income losses and seasonal food insecurity. Built-up areas, which overlap with cropland around Nakivale refugee settlement, are within medium to high flood risk zones.

The flooding trend corresponds with periods of above-average rainfall and seasonal river overflow, implying a strong link between climatic variability and local hydrological responses. Additionally, expanding settlement and land use changes, especially around refugee-hosting areas, have contributed to reduced infiltration and increased runoff, thereby amplifying flood occurrence.

Flood Impacts

Flooding in Isingiro District has had **multidimensional socio-economic and environmental impacts**. That said, flooding is highly localized, primarily affecting the northeastern and western parts of the district. In these areas, recurrent inundations have led to damage of crops and agricultural land, disrupting food production and household income for both host and refugee communities. Access roads and footpaths in flood-prone areas become impassable during heavy rainfall, affecting mobility and access to markets, schools, and health facilities. Floods have also contaminated water sources and damaged sanitation facilities, increasing the risk of waterborne diseases.

Photo 2: Floods in Isingiro District in May 2020. Photo credit: George Asiimwe

In May 2020, heavy and prolonged rainfall in Isingiro District caused flooding in several sub-counties, with Kabuyanda and Birere particularly affected. Aside from crops, houses, and other properties, torrential rains and the ensuing floods also affected livestock, such as cows and goats, which were swept away. Five people were confirmed dead, while others were missing initially. It is estimated that between 4,000 and 5,000 people were affected.

Most flash floods occur during the March-May and September-November rainy seasons, often leading to fatalities, displacement, and the destruction of infrastructure and crops.

Source: Death Toll in Isingiro Floods Rises to 3; More Still Missing | ChimpReports;

Environmentally, repeated flooding contributes to soil erosion, sedimentation of streams, and loss of vegetation cover, which further degrade the natural drainage systems and exacerbate future flood risk. Socially, households in persistently flooded areas often face temporary displacement, loss of shelter, and heightened vulnerability due to inadequate infrastructure and limited adaptive capacity. These cumulative impacts underline the **urgent need for integrated flood management, infrastructure improvement, and community-based adaptation strategies to enhance resilience in flood-affected areas in Isingiro District.**

Conclusion

The findings of this geospatial analysis highlight the substantial influence of climate-related hazards on both refugee and host communities in Isingiro District. Over the assessment period, the district has experienced seasonal drought conditions and recurrent localized flooding, which together **pose major risks to agricultural productivity, cattle farming, water availability, and settlement infrastructure.** The SPI and VCI analyses reveal widespread vegetation stress and rainfall deficits while flood mapping indicates high exposure in low-lying sub-counties such as **Kabuyanda and Birere**. These findings underscore the growing climate vulnerability of Isingiro District, emphasizing the need for targeted adaptation measures including improved water resource management, resilient agricultural practices, and settlement planning to safeguard livelihoods and enhance resilience for both refugee and host populations.

Methodology Overview

The climate risk assessment for Isingiro District used a combined geospatial, remote-sensing, and climate-modelling approach integrating historical baselines, future projections, and hazard-specific analyses. Historical climate conditions (1970-2000) were derived from WorldClim v2.1 using BIO1 (Annual Mean Temperature) and BIO12 (Annual Precipitation), clipped to the district and summarised through spatial and statistical analysis. Future projections for 2041-2060 were obtained from the UKESM1-0-LL model[45] under the SSP2-4.5 scenario, processed using the same bioclimatic variables to ensure comparability with the historical baseline.[46]

Drought assessment followed UN-SPIDER protocols[47], using SPI calculated in Google Earth Engine (GEE)[48][49] from CHIRPS rainfall data[50] (2014-2024) and VCI derived from NDVI time-series to measure vegetation stress. Agricultural and rangeland areas were manually delineated to improve spatial accuracy, and VCI classification followed Kogan (1995) standards.[51] Outputs were visualized and analysed in ArcGIS.

Flood mapping was conducted using Sentinel-1 SAR imagery processed in GEE to identify inundation for 2022-2024.[52] Annual flood layers were imported into ArcGIS, where raster summation generated a districtwide flood-frequency map. Together, the historical and projected climate datasets, SPI-VCI drought indicators, and multi-year flood mapping provide an integrated picture of climate hazards affecting both host communities and the Nakivale and Oruchinga Refugee Settlements in Isingiro District.

Limitations

The assessment primarily relied on remote-sensing and global climate datasets, which, while widely used, may not fully capture localized micro-climatic variations or ground-level conditions affecting vulnerability. Community-level vulnerability indicators such as coping capacity, water access constraints, and infrastructure fragility were not systematically integrated due to limited available data. Field verification of drought and flood extents was not conducted, though the satellite image processing followed established and validated UN-SPIDER protocols.

Further background information can be found in the Climate Risk Profiles for Refugee-Hosting Districts in Uganda Terms of Reference (TOR).

Note on Data Sources

Historical climate estimates in this report use both WorldClim (1970-2000 climatology) and ERA5-Land (1981-2024 reanalysis). These datasets use different observational networks, spatial resolutions and interpolation/assimilation methods and consequently report slightly different estimates of mean annual temperature for Isingiro (WorldClim ≈ 25.7°C for 1970-2000, ERA5-Land ≈ 24.7°C for early 1980s-2000). These differences are within the expected uncertainty range for gridded climate datasets and do not affect the overall interpretation of a warm tropical baseline and a clear recent warming trend. All historical temperatures in this report should therefore be understood as approximate values in the mid-20s (around 25-26°C) rather than exact point estimates.

To view/access the Climate Hazard Analyses for any of the following districts:

- Adjumani District
- Koboko District
- Yumbe District
- Terego District
- Madi Okollo District
- Lamwo District
- Obongi District
- Kyegegwa District
- Kiryandongo District
- Kamwenge District
- Kikuube District
- Isingiro District

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Definitions

Hazards: A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.[53]

Flood: The overflow of water onto land that is normally dry, resulting from the temporary inundation of areas due to factors such as intense or prolonged rainfall, river overflow, surface runoff, or failure of water control structures. Floods can vary in scale and duration and may cause damage to infrastructure, livelihoods, ecosystems, and human health.[54]

Flood Susceptibility: The likelihood of flooding occurring in an area based on physical, environmental, and climatic factors such as topography, rainfall intensity, and proximity to water bodies.[55]

Seasonal Drought: A temporary period of below-average rainfall within a specific season, resulting in soil moisture deficits and vegetation stress, particularly during critical agricultural periods.[56]

Meteorological Drought: A period of abnormally dry weather sufficiently prolonged to cause a serious hydrological imbalance, typically defined by a lack of precipitation relative to the long-term average[57]

Exposure: The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.[58]

Risk: The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.[59]

Water Stress: Water stress occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. Water stress causes deterioration of freshwater resources in terms of quantity (aquifer over-exploitation, dry rivers) and quality (eutrophication, organic matter pollution, saline intrusion).[60]

Disclaimer

This report provides an evidence-based overview of climate trends, hazards, and projected impacts in Uganda's refugee-hosting districts to support informed planning and decision-making. The analysis draws on historical climate datasets, remote sensing products, and modeled projections, all of which are subject to inherent uncertainties, assumptions, and methodological limitations.

The drought assessment presented in this report focuses primarily on seasonal drought conditions, using indicators such as the Standardized Precipitation Index (SPI) and the Vegetation Condition Index (VCI). These indicators capture short- to medium-term rainfall deficits and vegetation stress within specific seasons and should not be interpreted as representing long-term or permanent drought conditions.

Accordingly, the findings should be considered indicative rather than definitive, particularly at localized scales, where microclimatic variability, environmental conditions, and socio-economic factors may differ. While every effort has been made to ensure data accuracy, this report does not replace site-specific assessments or field verification.

The views expressed herein do not necessarily reflect those of any government, organization, or funding partner. This report should not be used as the sole basis for policy, investment, or operational decisions without further contextual analysis and validation.

Users are encouraged to complement these findings with local knowledge, stakeholder consultation, and additional data sources when designing interventions or resilience strategies.

In case of questions, feedback, or requests for tailored, area-specific remote-sensing products, kindly contact uganda@reach-initiative.org.

Endnotes

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ABOUT REACH

REACH Initiative facilitates the development of information tools and products that enhance the capacity of aid actors to make evidence-based decisions in emergency, recovery and development contexts. The methodologies used by REACH include primary data collection and in-depth analysis, and all activities are conducted through inter-agency aid coordination mechanisms. REACH is a joint initiative of IMPACT Initiatives, ACTED and the United Nations Institute for Training and Research - Operational Satellite Applications Programme (UNITAR-UNOSAT).

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