

Research Terms of Reference

Climate Risk Profiles for Refugee-Hosting Districts in Uganda

UGA2502

Uganda

September
2.0

REACH Informing
more effective
humanitarian action

1. Executive Summary

Country of intervention	Uganda		
Type of Emergency	<input checked="" type="checkbox"/> Natural hazard	<input type="checkbox"/> Conflict	<input type="checkbox"/> Other (<i>specify</i>)
Type of Crisis	<input type="checkbox"/> Sudden onset	<input checked="" type="checkbox"/> Slow onset	<input checked="" type="checkbox"/> Protracted
Mandating Body/ Agency	Foreign, Commonwealth and Development Office (FCDO)		
IMPACT Project Code	25AM/		
Overall Research Timeframe (<i>from research design to final outputs / M&E</i>)	02/06/2025 to 31/12/2025		
Research Timeframe <i>Add planned deadlines (for first cycle if more than 1)</i>	1. Pilot/ training: N/A	6. Preliminary presentation: 30/08/2025	
	2. Start collect data: 09/06/2025	7. Outputs sent for validation: 01/12/2025	
	3. Data collected: 01/09/2025	8. Outputs published: 19/12/2025	
	4. Data analysed: 01/10/2025	9. Final presentation: Upon request	
	5. Data sent for validation: N/A		
Number of assessments	<input checked="" type="checkbox"/> Single assessment (one cycle)		
	<input type="checkbox"/> Multi assessment (more than one cycle) <i>[Describe here the frequency of the cycle]</i>		
Humanitarian milestones <i>Specify what will the assessment inform and when</i> <i>e.g. The shelter cluster will use this data to draft its Revised Flash Appeal;</i>	Milestone		Deadline (can be tentative)
	<input checked="" type="checkbox"/>	Donor plan/strategy (FCDO)	31/12/2025
	<input type="checkbox"/>	Inter-cluster plan/strategy	--/ / --
	<input type="checkbox"/>	Cluster plan/strategy	--/ / --
	<input checked="" type="checkbox"/>	NGO platform plan/strategy	08/12/2025
<input checked="" type="checkbox"/>	Inter-Agency Refugee Response Plan (RRP)	2026 - 2029	
Audience Type & Dissemination <i>Specify who will the assessment inform and how you will disseminate to inform the audience</i>	Audience type		Dissemination
	<input type="checkbox"/> Strategic	<input checked="" type="checkbox"/> Programmatic	<input checked="" type="checkbox"/> General Product Mailing (using the IMPACT Uganda mailing list, and the WorkGrEEen mailing list)
	<input checked="" type="checkbox"/> Operational		<input type="checkbox"/> Cluster Mailing (Education, Shelter and WASH) and presentation of findings at next cluster meeting
	<input checked="" type="checkbox"/> Advocacy		<input checked="" type="checkbox"/> Presentation of findings (to donors and relevant stakeholders)

			<p>X Website Dissemination (U-LEARN Resource Centre & REACH Resource Centre)</p> <p>X We will engage key stakeholders including FAO, UNICEF, Ministry of Water and Environment (MWE), District Local Governments (DLGs) and the Office of the Prime Minister (OPM) [Other, Specify]</p>
<p>Stakeholder mapping Has a detailed stakeholder mapping been conducted during research design to identify all actors that could contribute to and/or benefit from the research?</p>	X	Yes	<input type="checkbox"/> No
General Objective	To better understand the current and projected climate conditions in Uganda's refugee-hosting districts, and the exposure of both refugee and host communities to climate-induced hazards particularly floods and droughts.		
Specific Objective(s)	<ul style="list-style-type: none"> To analyze the historical and projected climate patterns (temperature, rainfall) in refugee-hosting districts in Uganda. To assess the frequency, severity and spatial distribution of droughts and floods in refugee-hosting districts. To assess the extent of exposure of refugee and host communities to flood and drought hazards. 		
Research Questions	<ol style="list-style-type: none"> What are the historical and projected climate patterns (temperature and rainfall trends) in Uganda's refugee-hosting districts? How frequent and severe are drought and flood events in refugee-hosting districts, and how are these patterns distributed spatially? Which refugee-hosting districts are most exposed to flood and drought based on geo-spatial analysis of hazard extent? 		
Geographic Coverage	All 12 Refugee-hosting Districts: Adjumani, Isingiro, Kamwenge, Kikuube, Kiryandongo, Kyegegwa, Koboko, Lamwo, Madi Okollo, Obongi, Terego and Yumbe.		
Secondary data sources	<ol style="list-style-type: none"> Living with Climate-Related Hazards in Nyumanzi (Adjumani, Uganda) (2025) IMPACT Geospatial Analysis of Climate-Related Hazards and Adaptation Strategies in Nyumanzi settlement, Adjumani (2025) IMPACT Climate Risk Profile: Uganda (2021): The World Bank Group Uganda population dashboard Overview of refugees and asylum seekers in Uganda (2025) UNHCR Multi-Sector Needs Assessment (2024) REACH UN-Spider Agriculture Drought Monitoring and Hazard Assessment UN-Spider Flood Mapping Methodology CHIRPS Daily: Climate Hazards Center InfraRed Precipitation with Station Data (version 2.0 Final) 		

Population(s) <i>Select all that apply</i>	<input type="checkbox"/>	IDPs in camp	<input type="checkbox"/>	IDPs in informal sites
	<input type="checkbox"/>	IDPs in host communities	<input type="checkbox"/>	IDPs [Other, Specify]
	<input checked="" type="checkbox"/>	Refugees in camp	<input type="checkbox"/>	Refugees in informal sites
	<input type="checkbox"/>	Refugees in host communities	<input type="checkbox"/>	Refugees [Other, Specify]
	<input checked="" type="checkbox"/>	Host communities	<input type="checkbox"/>	[Other, Specify]
Stratification <i>Select type(s) and enter number of strata</i>	<input type="checkbox"/>	Geographical #: ___ Population size per strata is known? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	Group #: ___ Population size per strata is known? <input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/>	[Other Specify] #: ___ Population size per strata is known? <input type="checkbox"/> Yes <input type="checkbox"/> No
Data collection tool(s)	<input type="checkbox"/>	Structured (Quantitative)	<input type="checkbox"/>	Semi-structured (Qualitative)
	Sampling method		Data collection method	
Structured data collection tool # 1 <i>Select sampling and data collection method and specify target # interviews</i>	<input type="checkbox"/> Purposive <input type="checkbox"/> Probability / Simple random <input type="checkbox"/> Probability / Stratified simple random <input type="checkbox"/> Probability / Cluster sampling <input type="checkbox"/> Probability / Stratified cluster sampling <input type="checkbox"/> [Other, Specify]		<input type="checkbox"/> Key informant interview (Target #): _____ <input type="checkbox"/> Group discussion (Target #): _____ <input type="checkbox"/> Household interview (Target #): _____ <input type="checkbox"/> Individual interview (Target #): _____ <input type="checkbox"/> Direct observations (Target #): _____ <input type="checkbox"/> [Other, Specify] (Target #): _____	
Structured data collection tool # 2 <i>Select sampling and data collection method and specify target # interviews</i> <i>***If more than 2 structured tools please duplicate this row and complete for each tool.</i>	<input type="checkbox"/> Purposive <input type="checkbox"/> Probability / Simple random <input type="checkbox"/> Probability / Stratified simple random <input type="checkbox"/> Probability / Cluster sampling <input type="checkbox"/> Probability / Stratified cluster sampling <input type="checkbox"/> [Other, Specify]		<input type="checkbox"/> Key informant interview (Target #): _____ <input type="checkbox"/> Group discussion (Target #): _____ <input type="checkbox"/> Household interview (Target #): _____ <input type="checkbox"/> Individual interview (Target #): _____ <input type="checkbox"/> Direct observations (Target #): _____ <input type="checkbox"/> [Other, Specify] (Target #): _____	
Semi-structured data collection tool (s) # 1 <i>Select sampling and data collection method and specify target # interviews</i>	<input type="checkbox"/> Purposive <input type="checkbox"/> Snowballing <input type="checkbox"/> [Other, Specify]		<input type="checkbox"/> Key informant interview (Target #): _____ <input type="checkbox"/> Individual interview (Target #): _____ <input type="checkbox"/> Focus group discussion (Target #): _____ <input type="checkbox"/> [Other, Specify] (Target #): _____	
Semi-structured data collection tool (s) # 2 <i>Select sampling and data collection method and specify target # interviews</i> <i>***If more than 2 structured tools please duplicate this row and complete for each tool.</i>	<input type="checkbox"/> Purposive <input type="checkbox"/> Snowballing <input type="checkbox"/> [Other, Specify]		<input type="checkbox"/> Key informant interview (Target #): _____ <input type="checkbox"/> Individual interview (Target #): _____ <input type="checkbox"/> Focus group discussion (Target #): _____ <input type="checkbox"/> [Other, Specify] (Target #): _____	
Target level of precision if probability sampling	__% level of confidence		__+/- % margin of error	
Disaggregation by gender and age	Gender		Age	
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	Yes

Are you planning to conduct sex/age disaggregated analysis?	<input type="checkbox"/>	No	<input type="checkbox"/>	No		
Data management platform(s)	<input type="checkbox"/>	IMPACT	<input type="checkbox"/>	UNHCR		
	<input type="checkbox"/>	[Other, Specify]				
Expected output type(s)	<input type="checkbox"/>	Situation overview #: __	<input checked="" type="checkbox"/>	Report #: 1	<input type="checkbox"/>	Profile #: __
	<input checked="" type="checkbox"/>	Presentation (Preliminary findings) #: 2	<input checked="" type="checkbox"/>	Presentation (Final) #: 1	<input type="checkbox"/>	Factsheet #: __
	<input type="checkbox"/>	Interactive dashboard #: _	<input type="checkbox"/>	Webmap #: __	<input checked="" type="checkbox"/>	Map #: 12
	<input type="checkbox"/>	[Other, Specify] #: __				
Access	<input checked="" type="checkbox"/>	Public (available on REACH resource center and other humanitarian platforms)				
	<input type="checkbox"/>	Restricted (bilateral dissemination only upon agreed dissemination list, no publication on REACH or other platforms)				
Visibility Specify which logos should be on outputs	IMPACT, U-LEARN					
	Donor: FCDO					
	Coordination Framework: N/A					
	Partners: U-LEARN					

2. Rationale

2.1 Background

Uganda hosts over 1.9 million refugees, primarily from South Sudan, the Democratic Republic of Congo, and Burundi and this makes it the largest refugee-hosting country in Africa.¹ The majority of these refugees are settled in designated refugee-hosting districts located predominantly in the West Nile and South-west regions of the country. These districts include Adjumani, Isingiro, Kamwenge, Kikuube, Kiryandongo, Kyegegwa, Koboko, Lamwo, Madi Okollo, Obongi, Terego, and Yumbe. These areas are not only under immense demographic pressure due to the growing refugee populations but are also increasingly exposed to the adverse effects of climate change, particularly the rising frequency and intensity of extreme weather events such as droughts and floods.²

Uganda's climate is undergoing significant changes, with increasing variability in rainfall patterns and rising average temperatures.³ These climatic shifts have intensified environmental degradation, disrupted agricultural productivity, strained water resources, and increased vulnerability to food insecurity especially in regions already hosting vulnerable populations.⁴ Refugee and host communities in these areas face overlapping risks due to climate stressors, limited adaptive capacity, and already fragile ecosystems. In many districts, floods damage infrastructure and displace both refugee and host households, while recurrent droughts contribute to crop failures, livestock losses, and worsening livelihoods.⁵

Despite the growing threat of climate hazards in refugee-hosting districts, there remains a gap in localized and actionable climate risk information. Decision-makers, humanitarian actors, development planners, and local governments require evidence-based tools to understand district-specific climate risks and integrate them into programming and planning

¹ UNHCR. (2025). Uganda Comprehensive Refugee Response Portal. <https://data.unhcr.org/en/country/uga>

² Living with Climate-Related Hazards in Nyumanzi, Adjumani, Uganda. (IMPACT, 2025). https://repository.impact-initiatives.org/document/impact/830f385e/IMPACT_UGA_Report_Climate-ABA-in-Nyumanzi_April-2025.pdf

³ Uganda National Meteorological Authority (UNMA). (2023). State of the Climate Report 2022/2023. Government of Uganda.

⁴ IIED. (2018). Climate Risk Assessment for Uganda. International Institute for Environment and Development.

⁵ FAO. (2018). Reducing the Impacts of Climate Risk on Livelihoods in Karamoja, Uganda. Food and Agriculture Organization of the United Nations.

processes. Developing climate risk profiles at the district level is therefore critical for enhancing resilience, informing disaster preparedness, and guiding targeted climate adaptation strategies that address both refugee and host community needs.⁶ This study seeks to fill this gap by analyzing the climate context, identifying key hazards (focusing on drought and flooding), assessing their historical trends and projected patterns, and providing recommendations for climate risk mitigation and adaptation. By doing so, it aims to strengthen climate-informed planning and risk reduction in Uganda's refugee-hosting districts, contributing to both humanitarian and sustainable development outcomes.⁷

2.2 Intended impact

This study aims to generate district-specific Climate Risk Profiles for 12 refugee-hosting districts in Uganda to support evidence-based planning and climate-resilient development. By identifying key climate hazards particularly droughts and floods and assessing their frequency, severity, and impacts on refugee and host communities, the profiles will provide critical insights into the vulnerability and exposure of people, infrastructure, and key livelihood systems.

The assessment is designed to facilitate informed decision-making and targeted action to mitigate climate-related disaster risks. It will support district and national authorities, humanitarian actors, and development partners in prioritizing resources, integrating climate risks into refugee response and development plans, and implementing tailored adaptation and preparedness strategies. The findings will be shared with local governments, the Office of the Prime Minister (OPM), and relevant coordination platforms to enhance early warning systems, improve response planning, and guide anticipatory action.

Ultimately, the study aims to strengthen the resilience of displacement-affected populations and critical infrastructure, contributing to more sustainable and climate-resilient development across Uganda's refugee-hosting districts.

3. Methodology

3.1 Methodology overview

The climate risk profiling for 12 refugee-hosting districts in Uganda focused specifically on drought and flood hazards, using a combination of geospatial analysis, remote sensing, and quantitative secondary data. Satellite data and GIS techniques were used to assess the spatial distribution, frequency, and severity of these hazards. Quantitative secondary data from IMPACT Initiatives, UNHCR, and other humanitarian and development partners, along with national sources such as UBOS and the Office of the Prime Minister, supported the analysis of settlement locations, population distribution, and infrastructure to understand the exposure of refugee and host communities.

This study adopts a geospatial analysis framework that integrates satellite Earth observation data, climate indices, and refugee-hosting district-level spatial boundaries to assess drought and flood risks. For each objective, suitable remote sensing indices and spatial datasets will be selected based on their relevance and compatibility with UN-Spider recommended methods.

Objective 1: Analyze historical and projected climate patterns (temperature and rainfall)

⁶ UNDP. (2015). Climate Risk Management for Sustainable Crop Production in Rakai and Kapchorwa Districts of Uganda. United Nations Development Programme.

⁷ Uganda Ministry of Water and Environment. (2020). National Climate Change Policy Implementation Strategy. Government of Uganda.

Average monthly climate conditions .i.e. average temperature and precipitation by month; long-term trends in temperature and rainfall will be examined using gridded datasets such as CHIRPS (for precipitation) and ERA5-Land (for temperature).

To assess climate change trends, the study will use both historical and future climate data whereby, the historical climate assessment will use WorldClim version 2.1 providing high-resolution climate data for the period 1970-2000 whereas future climate projections will use downscaled datasets from the Coupled Model Intercomparison Project Phase 6 (CMIP6). This study will focus on the 2041-20260 period because it represents the mid-century timeframe that aligns with policy planning horizons for climate adaptation and sustainable development.

Objective 2: Assess the frequency, severity and spatial distribution of drought and flood events

For drought monitoring, the analysis will follow the UN-SPIDER Recommended Practices for Agricultural Drought Monitoring, which involve calculating the Vegetation Condition Index (VCI) using the MODIS NDVI (MOD13Q1) dataset. VCI is computed by normalizing current NDVI values against long-term historical minima and maxima, providing a robust indicator of vegetation stress related to water availability. This approach is particularly effective for detecting early signs of agricultural drought. In parallel, meteorological drought will be assessed using the Standardized Precipitation Index (SPI) derived from the CHIRPS rainfall dataset. SPI will be calculated at 1-month, 3-month, and 6-month intervals to capture both short- and medium-term precipitation anomalies, in alignment with best practices for drought risk monitoring.

For flood hazard assessment, the study will utilize Sentinel-1 Synthetic Aperture Radar (SAR) imagery, following the UN-SPIDER Flood Mapping methodology. SAR's ability to penetrate cloud cover makes it ideal for detecting floodwater, especially during peak rainfall seasons.

Objective 3: Assess the exposure of refugee and host communities to flood and drought hazards

The spatial overlay of hazard maps (from objective 2) with exposure layers, will enable the identification of Sub-counties and settlements in the refugee-hosting districts with the greatest extent and frequency of climatic hazards.

Overlaying hazard and exposure data will provide a spatial understanding of where risks are highest, to support targeted adaptation planning.

3.2 Population of interest

The study will cover all the 12 refugee-hosting districts in two regions of Uganda. The South-Western region consists of Isingiro, Kamwenge, Kikuube, Kyegegwa, Kiryandongo districts and the West-Nile region consists of districts of Adjumani, Koboko, Lamwo, Madi Okollo, Obongi, Terego and Yumbe.

3.3 Secondary data review

Sources that will inform on the contextual background in Uganda include:

- [Uganda population dashboard Overview of refugees and asylum seekers in Uganda](#) (2025) UNHCR
- [Living with Climate-Related Hazards in Nyumanzi \(Adjumani, Uganda\)](#) (2025) IMPACT
- [Geospatial Analysis of Climate-Related Hazards and Adaptation Strategies in Nyumanzi settlement, Adjumani](#) (2025) IMPACT
- [Climate Risk Profile: Uganda \(2021\): The World Bank Group](#)

Sources that will inform triangulation of findings include:

- [Multi-Sector Needs Assessment](#) (2024) REACH

Sources that will inform the assessment methodology include:

- [UN-Spider Agriculture Drought Monitoring and Hazard Assessment](#)
- [UN-Spider Flood Mapping Methodology](#)
- [CHIRPS Daily: Climate Hazards Center InfraRed Precipitation with Station Data \(version 2.0 Final\)](#)

3.4 Data and Tools

Data

The following summary contains the datasets that will be used in this study together with some of their metadata.

Data	Format	Spatial Resolution / Scale	Temporal Coverage	Source / Platform
MODIS NDVI (MOD13Q1) - for VCI	Raster	250 m	2000 - present, 16-day composite	Google Earth Engine
CHIRPS Rainfall Estimates - for SPI	Raster	~5 km (~0.05°)	1981 - present, daily/monthly	Google Earth Engine
ERA5 Precipitation (Monthly) - for SPI (alternative)	Raster	~10 km (~0.1°)	1979 - present	Google Earth Engine
Sentinel-1 SAR (VV/VH) - for flood extent mapping	Raster	10 m	2014 - present, 6 - 12 days revisit	Google Earth Engine
JRC Global Surface Water - for baseline flood-prone areas	Raster	30 m	1984 - 2020	Google Earth Engine
Administrative Boundaries (Districts, Sub-counties)	Vector	N/A	Most recent available	Uganda Bureau of Statistics (UBOS) / HDX
Land Cover (ESA WorldCover 10m) - for exposure & flood masking	Raster	10 m	2020 - 2022	ESA / Google Earth Engine

Tools

ArcGIS Pro

We will use ArcGIS Pro to prepare the datasets and for presentation of resulting mapping products from the analysis.

Google Earth Engine

We will leverage the computational capabilities of Google Earth Engine to analyze satellite imagery in accordance with the UN-Spider methodology for Agriculture Drought Monitoring and Hazard Assessment.

3.5 Data Processing & Analysis

This section describes how the datasets and indices listed above will be processed and analyzed to derive key insights for each objective. All processing will be conducted using Google Earth Engine for remote sensing workflows and ArcGIS Pro for spatial overlays, zonal statistics, and map generation.

Climate trends and projections

Monthly CHIRPS data (1981–present) will be processed in Google Earth Engine to compute annual average rainfall totals per district. A linear trend analysis will be performed to detect changes over time, and rainfall anomalies will be calculated to identify periods of extreme wet or dry conditions. ERA5-Land datasets will be used to generate monthly and annual mean temperatures. Anomaly maps and trend lines will be produced to assess long-term warming patterns in each refugee-hosting district.

To analyze the historical and projected climate patterns in Uganda’s refugee-hosting districts, this study will use bioclimatic variables derived from WorldClim v2.1 and CMIP6 datasets. For historical climate trends (1970–2000), we will extract BIO1 (Annual Mean Temperature) and BIO12 (Annual Precipitation) at a spatial resolution of ~1 km², clipped to each refugee-hosting district. Zonal statistics will be applied to assess spatial variability and district-level climate baselines.

For future projections (2041–2060), downscaled outputs from the GFDL-ESM4 model will be used under two emission scenarios: SSP1-2.6 (low emissions) and SSP3-7.0 (high emissions). The same bioclimatic variables will be analyzed to assess changes in temperature and precipitation patterns across districts. Data processing and spatial analysis will be conducted using ArcGIS Pro to generate maps and statistical summaries that will inform climate change trends relevant for adaptation planning in refugee-hosting areas.

Drought and Flood hazard analysis

Standardized Vegetation Index (SPI)

The SPI analysis will be conducted using the UN-Spider Drought Monitoring methodology within Google Earth Engine (GEE). Daily precipitation data from the CHIRPS will be used to calculate SPI values at a monthly interval.

SPI will be calculated by fitting the long-term precipitation record to a probability distribution, which is then transformed into a normal distribution so that the mean SPI value for the location and period is zero. Positive SPI values indicate greater than median precipitation, while negative values indicate less than median precipitation. SPI will then be computed for different timescales, reflecting the impact of drought on various water resources.

The SPI values are typically classified into categories that describe the severity of wet and dry conditions. According to the World Meteorological Organization’s Standardized Precipitation Index User Guide, the classification is as follows:

Table 1: SPI Classification Table

SPI Value Range	Classification
2.0 and above	Extremely wet
1.5 to 1.99	Very wet
1.0 to 1.49	Moderately wet
-0.99 to 0.99	Near normal
-1.0 to -1.49	Moderately dry
-1.5 to -1.99	Severely dry
-2.0 and below	Extremely dry

Vegetation Condition Index (VCI)

The VCI analysis will be conducted following the UN-Spider Agriculture Drought Monitoring and Hazard Assessment methodology using Google Earth Engine (GEE). The analysis will focus on the 12 refugee-hosting districts, incorporating surrounding agricultural and rangeland areas. To enhance accuracy, these land cover types will be manually digitized in Google Earth Pro.

The VCI will be generated to assess drought severity. VCI measures vegetation health based on NDVI variations. These indices will be used to derive a Drought Index, classifying drought severity into categories ranging from mild to extreme (Kogan, 1995).

The processed VCI raster datasets will be exported to ArcGIS Pro for further spatial analysis and mapping. This will allow for a detailed visualization of drought severity across the 12 refugee-hosting districts, offering insights into agricultural productivity, pasture conditions and food security for both refugee and host communities.

The Vegetation Condition Index (VCI) is a remote sensing-based drought monitoring index that measures how close the current month's Normalized Difference Vegetation Index (NDVI) is to its historical minimum and maximum values. It helps assess vegetation health and drought severity.

Table 2: Drought grades defined by Vegetation Condition Index (VCI)

VCI range	Drought classification	Interpretation
< 0.10	Extreme Drought	Severe vegetation stress, high likelihood of crop failure
0.10 – 0.20	Severe Drought	Significant vegetation stress, reduced agricultural productivity
0.20 – 0.30	Moderate Drought	Noticeable vegetation decline, affecting some crops and pastures
0.30 – 0.40	Mild Drought	Slight reduction in vegetation health, but not critical
0.40 – 0.50	Near Normal Conditions	Vegetation is close to historical averages
0.50 – 1.00	No Drought (Optimal Conditions)	Healthy vegetation, normal or above-average conditions

Flood extent mapping

The flood assessment will determine the impact of recurring floods in the 12 Refugee-hosting districts, between 2020 and 2024. The UN-SPIDER methodology, which is a recognized approach for flood detection and damage assessment, will be used to map flooded areas and assess their effects on communities and land use.

The Sentinel-1 Synthetic Aperture Radar (SAR) data in Google Earth Engine (GEE) will be analyzed to provide a detailed view of flood patterns, even in areas where on-the-ground data is limited.

All hazard data will be processed into raster formats and overlaid with vector administrative boundaries of Uganda's refugee-hosting districts. Spatial and temporal analyses will be conducted to quantify exposure levels, assess trends, and produce hazard maps, time-series charts, and district-level risk summaries. The outputs will directly inform evidence-based climate adaptation and disaster risk reduction planning for both refugee and host communities.

3.6 Limitations

This study is limited in its ability to comprehensively assess community-level vulnerability to drought and flood hazards. While vulnerability indicators such as dependence on rain-fed agriculture or inadequate infrastructure are crucial for understanding risk, this analysis primarily relies on open-source and remotely sensed data. As such, detailed socio-economic and infrastructure data on refugee and host communities will not be fully integrated. Fieldwork and ground validation of satellite-based findings will not be conducted; however, image processing and analysis will follow established remote sensing methodologies, including those recommended by UN-SPIDER. To enhance the robustness of the results, selected findings will be triangulated with existing survey data, particularly the 2024 Multi-Sector Needs Assessment (MSNA), where relevant.

4. Key ethical considerations and related risks

The proposed research design meets / does not meet the following criteria:

<i>The proposed research design...</i>	Yes/ No	Details if no (including mitigation)
... Has been coordinated with relevant stakeholders to avoid unnecessary duplication of data collection efforts?	Yes	
... Respects respondents, their rights and dignity (<i>specifically by: seeking informed consent, designing length of survey/ discussion while being considerate of participants' time, ensuring accurate reporting of information provided</i>)?	Yes	
... Does not expose data collectors to any risks as a direct result of participation in data collection?	Yes	Data collectors will not be recruited for this study.
... Does not expose respondents / their communities to any risks as a direct result of participation in data collection?	Yes	
... Does not involve collecting information on specific topics which may be stressful and/ or re-traumatising for research participants (both respondents and data collectors)?	Yes	
... Does not involve data collection with minors i.e. anyone less than 18 years old?	Yes	
... Does not involve data collection with other vulnerable groups e.g. persons with disabilities, victims/ survivors of protection incidents, etc.?	Yes	
... Follows IMPACT SOPs for management of personally identifiable information ?	Yes	

5. Roles and responsibilities

Task Description	Responsible	Accountable	Consulted	Informed
Research design	GIS Officer	Associate Research Manager	Climate and DRR Specialist-HQ	Associate Research Manager
Supervising data collection	-	-	-	-
Data processing (checking, cleaning)	GIS Officer	Climate and DRR Specialist-HQ	Climate and DRR Specialist-HQ	Associate Research Manager
Data analysis	GIS Officer	Climate and DRR Specialist-HQ	Climate and DRR Specialist-HQ	Associate Research Manager
Output production	GIS Officer	Climate and DRR Specialist-HQ	Associate Research Manager	Country Coordinator
Dissemination	GIS Officer	Climate and DRR Specialist-HQ	Associate Research Manager	Country Coordinator
Monitoring & Evaluation	GIS Officer	Associate Research Manager		Country Coordinator
Lessons learned	GIS Officer	Associate Research Manager		Country Coordinator

Responsible: the person(s) who executes the task

Accountable: the person who validates the completion of the task and is accountable of the final output or milestone

Consulted: the person(s) who must be consulted when the task is implemented

Informed: the person(s) who need to be informed when the task is completed

6. Data Analysis Plan

EXAMPLE 1: RESEARCH QUESTIONS ADDRESSED WITH SEMI-STRUCTURED TOOL(S)

Research questions	SUBQ#	Sub-question	Questionnaire QUESTION	Probes	Data collection method	Key disaggregations (Group types)
1. What are the historical and projected climate patterns (temperature and rainfall trends) in Uganda's refugee-hosting districts?	N/A	N/A	N/A	N/A	Secondary data from publicly available satellite and climate model datasets.	-> Area type (Urban formal, Urban informal, Rural formal, Rural informal) '-> Location type (Refugee-hosting districts) '-> Response level (Low; High)
2. How frequent and severe are drought and flood events in refugee-hosting districts, and how are these patterns distributed spatially?	N/A	N/A	N/A	N/A	Secondary data collection using remote sensing and geospatial datasets.	-> Area type (Urban formal, Urban informal, Rural formal, Rural informal) '-> Location type (Refugee-hosting districts) '-> Response level (Low; High)
3. Which refugee-hosting districts are most exposed to flood and drought based on geo-spatial overlay of hazard layers on local population, land use, livelihood zones and infrastructure?	N/A	N/A	N/A	N/A	Spatial overlay analysis using remote sensing derived layers and secondary geospatial datasets representing population, livelihood zones, land use and infrastructure.	-> Area type (Urban formal, Urban informal, Rural formal, Rural informal) '-> Location type (Refugee-hosting districts) '-> Response level (Low; High)

7. Data Management Plan

Administrative Data		
Research Cycle name	UGA2502 Climate Risk Profiles for Refugee-Hosting Districts in Uganda	
Project Code	25AMI	
Donor	Foreign, Commonwealth and Development Office (FCDO)	
Project partners	U-LEARN	
Research Contacts	Nyarwaya Amos amos.nyarwaya@reach-initiative.org Gemma Bennett gemma.bennett@impact-initiatives.org	
Data Management Plan Version	Date: 26/09/2025	Version: 1
Related Policies	N/A	
Documentation and Metadata		
What documentation and metadata will accompany the data? <i>Select all that apply</i>	<input type="checkbox"/> Data analysis plan	<input type="checkbox"/> Data Cleaning Log, including: <input type="checkbox"/> Deletion Log <input type="checkbox"/> Value Change Log
	<input type="checkbox"/> Code book	<input type="checkbox"/> Data Dictionary
	<input checked="" type="checkbox"/> Metadata based on HDX Standards	<input type="checkbox"/> [Other, Specify]
Ethics and Legal Compliance		
Which ethical and legal measures will be taken?	<input type="checkbox"/> Consent of participants to participate	<input type="checkbox"/> Consent of participants to share personal information with other agencies
	<input type="checkbox"/> No collection of personally identifiable data will take place	<input type="checkbox"/> Gender, child protection and other protection issues are taken into account
	<input type="checkbox"/> All participants reached age of majority	[Other, Specify]
Who will own the copyright and Intellectual Property Rights for the data that is collected?	N/A	
Storage and Backup		
Where will data be stored and backed up during the research?	<input type="checkbox"/> IMPACT/REACH Kobo Server	<input type="checkbox"/> Other Kobo Server: <i>[specify]</i>
	<input type="checkbox"/> IMPACT Global Physical / Cloud Server	<input type="checkbox"/> Country/Internal Server
	<input type="checkbox"/> On devices held by REACH staff	<input type="checkbox"/> Physical location <i>[specify]</i>
	<input type="checkbox"/> [Other, Specify]	
Which data access and security measures have been taken?	<input type="checkbox"/> Password protection on devices/servers	<input type="checkbox"/> Data access is limited to <i>[specify, e.g. REACH staff]</i>
	<input type="checkbox"/> Form and data encryption on data collection server	<input type="checkbox"/> Partners signed an MoU if accessing raw data
	<input type="checkbox"/> [Other, Specify]	
Kobo Access Rights		
Kobo Access	Person	Account Name
View Form	N/A	N/A

View and Edit Form	N/A	N/A			
View Form and Submit Data	N/A	N/A			
Raw Data Access Rights					
Raw Data Access	Reason	Person			
Accountable	Accountable	N/A			
Access	[Explain why this person needs to access to raw data, e.g. GIS: choropleth maps using GPS points]	N/A			
[Add relevant number of rows for access rights]	...	[Insert name]			
Preservation					
Where will data be stored for long-term preservation?	<input type="checkbox"/> IMPACT / REACH Global Cloud / Physical Server	<input type="checkbox"/> OCHA HDX			
	<input type="checkbox"/> REACH Country Server	X [Other, Specify] N/A			
Data Sharing					
Will the data be shared publically?	<input type="checkbox"/> Yes	<input type="checkbox"/> No, only with mandating agency / body			
Will all data be shared?	<input type="checkbox"/> Yes	<input type="checkbox"/> No, only anonymized/ cleaned/ consolidated <i>[delete what does not apply]</i> data will be shared			
	X No, [Other, Specify] N/A				
Where will you share the data?	<input type="checkbox"/> REACH Resource Centre	<input type="checkbox"/> OCHA HDX			
	<input type="checkbox"/> HumanitarianResponse	X [Other, Specify] N/A			
Data protection risk assessment					
Have you completed the Indicators Risk Assessment table below?	<input type="checkbox"/> Yes	X No, no information that potentially allows identification of individuals is to be collected.			
	[Please complete the first 4 columns in the Indicators Risk Assessment table below]				
Risk indicator (including direct and indirect identifiers)	Type of identification risk	Disclosure implications	Benefits	Class	Required mitigation
[Specify indicator, e.g. KI_phone number]	[Specify identification risk, e.g. Direct contact/identification of KI]	[Specify implications, e.g. loss of privacy/potential target of armed actors]	[Specify benefits, e.g. follow up for data cleaning]	[To be completed by IMPACT HQ]	[To be specified by IMPACT HQ]
[Add relevant number of rows for risk indicators]					
Responsibilities					

Data collection	N/A
Data cleaning	N/A
Data analysis	N/A
Data sharing/uploading	N/A

8. Monitoring & Evaluation Plan

IMPACT Objective	External M&E Indicator	Internal M&E Indicator	Focal point	Tool	Will indicator be tracked?
Humanitarian stakeholders are accessing IMPACT products	Number of humanitarian organisations accessing IMPACT services/products Number of individuals accessing IMPACT services/products	# of downloads of x product from Resource Center	Country request to HQ	User_log	X Yes
		# of downloads of x product from Relief Web	Country request to HQ		X Yes
		# of downloads of x product from Country level platforms	Country team		X Yes
		# of page clicks on x product from REACH global newsletter	Country request to HQ		X Yes
		# of page clicks on x product from country newsletter, sendingBlue, bit.ly	Country team		X Yes
		# of visits to x webmap/x dashboard	Country request to HQ		<input type="checkbox"/> Yes
IMPACT activities contribute to better program implementation and coordination of the humanitarian response	Number of humanitarian organisations utilizing IMPACT services/products	# references in HPC documents (HNO, SRP, Flash appeals, Cluster/sector strategies)	Country team	Reference_log	2026 UCRRP
		# references in single agency documents			2026 UCRRP
Humanitarian stakeholders are using IMPACT products	Humanitarian actors use IMPACT evidence/products as a basis for decision making, aid planning and delivery	Perceived relevance of IMPACT country-programs	Country team	Usage_Feed back and Usage_Survey template	<i>Informal tracking through feedback from agencies, stakeholders, donor(s), working groups, following output dissemination and presentations.</i>
	Number of humanitarian	Perceived usefulness and influence of IMPACT outputs			

	documents (HNO, HRP, cluster/agency strategic plans, etc.) directly informed by IMPACT products	Recommendations to strengthen IMPACT programs			
		Perceived capacity of IMPACT staff			
		Perceived quality of outputs/programs			
		Recommendations to strengthen IMPACT programs			
Humanitarian stakeholders are engaged in IMPACT programs throughout the research cycle	Number and/or percentage of humanitarian organizations directly contributing to IMPACT programs (<i>providing resources, participating to presentations, etc.</i>)	# of organisations providing resources (i.e.staff, vehicles, meeting space, budget, etc.) for activity implementation	Country team	Engagement_log	<input type="checkbox"/> Yes
		# of organisations/clusters inputting in research design and joint analysis			<input type="checkbox"/> Yes
		# of organisations/clusters attending briefings on findings;			<input checked="" type="checkbox"/> Yes

ANNEX 1: METHODOLOGY NOTES (IF RELEVANT)

ANNEX 2: [OTHER SPECIFY]