THE REPUBLIC OF UGANDA

# Kapchorwa District

## Hazard, Risk And Vulnerability Profile

2016

## ACKNOWLEDGEMENT

On behalf of Office of the Prime Minister, I wish to express my sincere appreciation to all of the key stakeholders who provided their valuable inputs and support to this Multi-Hazard, Risk and Vulnerability mapping exercise that led to the production of comprehensive district Hazard, Risk and Vulnerability (HRV) profiles.

I extend my sincere thanks to the Department of Relief, Disaster Preparedness and Management, under the leadership of the Commissioner, Mr. Martin Owor, for the oversight and management of the entire exercise.

The HRV assessment team was led by Ms. Ahimbisibwe Catherine, Senior Disaster Preparedness Officer supported by Mr. Kirungi Raymond, Disaster Preparedness Officer and the team of consultants (GIS/DRR specialists); Dr. Bernard Barasa, and Mr. Nsiimire Peter, who provided technical support.

Our gratitude goes to UNDP for providing funds to support the Hazard, Risk and Vulnerability Mapping. The team comprised of Mr. Steven Goldfinch – Disaster Risk Management Advisor, Mr. Gilbert Anguyo - Disaster Risk Reduction Analyst, and Mr. Ongom Alfred-Early Warning system Programmer.

My appreciation also goes to Kapchorwa District Team:

1. Mr. Chemangei Awadh – District Natural Resources Officer
2. Mr. Ojangole O. Silvester- Natural Resources Officer

The entire body of stakeholders who in one way or another yielded valuable ideas and time to support the completion of this exercise.

**Hon. Hilary O. Onek**
**Minister for Relief, Disaster Preparedness and Refugees**

## EXECUTIVE SUMMARY

The multi-hazard vulnerability profile outputs from this assessment was a combination of spatial modeling using socio-ecological spatial layers (i.e. DEM, Slope, Aspect, Flow Accumulation, Land use, vegetation cover, hydrology, soil types and soil moisture content, population, socio-economic, health facilities, accessibility, and meteorological data) and information captured from District Key Informant interviews and sub-county FGDs using a participatory approach. The level of vulnerability was assessed at sub-county participatory engagements and integrated with the spatial modeling in the GIS environment. The methodology included five main procedures i.e.

### Preliminary spatial analysis

Hazard prone areas base maps were generated using Spatial Multi-Criteria Analysis (SMCA) was done in a GIS environment (ArcGIS 10.1).

### Stakeholder engagements

Stakeholder engagements were carried out in close collaboration with OPM's DRM team and the district disaster management focal persons with the aim of identifying the various hazards ranging from drought, to floods, landslides, human and animal disease, pests, animal attacks, earthquakes, fires, conflicts etc. Stakeholder engagements were done through Focus Group Discussions (FGDs) and key informant interviews guided by checklist tools (Appendix I). At district level Key Informants included: District Agricultural Officer, District Natural Resources Officer, District Health Inspector and District Planner while at sub-county level Key informants included: Sub-county and parish chiefs, community Development mobilisers and health workers.

FGDs were carried out in five purposively selected sub-counties that were ranked with highest vulnerability. FGDs comprising of an average of 12 respondents (crop farmers, local leaders, nursing officers, police officers and cattle keepers) were conducted at Kawowo, Kapchesombe, Kaptanya, and Kapsinda Sub-counties. Each Parish of the selected Sub-counties was represented by at least one participant and the selection of participants was engendered. FGDs were conducted with utmost consideration to the various gender categories (women, men) with respect to age groups since hazards affect both men and women though in different perspectives irrespective of age.

### Participatory GIS

Using Participatory GIS (PGIS), local communities were involved in identifying specific hazard prone areas on the Hazard base maps. This was done during the FGDs and participants were requested through a participatory process to develop a community hazard profile map.

### Geo-referencing and ground-truthing

The identified hazard hotspots in the community profile maps were ground-truthed and geo-referenced using a handheld Spectra precision Global Positioning System (GPS) unit, model: Mobile Mapper 20 set in WGS 1984 Datum. The entities captured included: hazard location, (Sub-county and parish), extent of the hazard, height above sea level, slope position, topography, neighboring land use among others. Hazard hot spots, potential

and susceptible areas will be classified using a participatory approach on a scale of “not reported/ not prone”, “low”, “medium” and “high”.

**Data analysis and integration**
Data analysis and spatial modeling was done by integrating spatial layers and non-spatial attribute captured from FGDs and KIIs to generate final HRV maps at Sub-county level.

**Data verification and validation**
In collaboration with OPM, a five days regional data verification and validation workshop was organized by UNDP in Mbale Municipality as a central place within the region. This involved key district DDMC focal persons for the purpose of creating local/district ownership of the profiles.

Multi-hazards experienced in Kapchorwa district were classified as:
- Geomorphological or Geological hazards including; landslides, rock falls, soil erosion and earth quakes.
- Climatological or Meteorological hazards including; floods, drought, hailstorms, strong winds and lightning
- Ecological or Biological hazards including crop pests and diseases, livestock pests and diseases, human disease outbreaks, vermin and wildlife animal attacks and invasive species.
- Human induced or Technological hazards including bush fires, road accidents land conflicts.

General findings from the participatory assessment indicated that Kapchorwa district has over the past two decades increasingly experienced hazards including; rock falls, soil erosion, floods, drought, hailstorms, strong winds, lightning, crop pests and diseases, livestock pests and diseases, human disease outbreaks, vermin, wildlife animal attacks, invasive species, bush fires, road accidents and land conflicts putting livelihoods at increased risk. Soil erosion, land conflicts and environmental degradation were identified as most serious problems in Kapchorwa district with almost all sub-counties being vulnerable to the hazards. This is because the area is generally hilly with steep slopes, valleys, radial drainage with Sipi being the main river and a number of other rivers and stream flowing Northwards from Mt. Elgon.

The limited adaptive capacity (and or/resilience) and high sensitivity of households and communities in the district increases their vulnerability to hazard exposure necessitating urgent external support. To reduce vulnerability at community, local government and national levels should be a threefold effort hinged on:
- Reducing the impact of the hazard where possible through mitigation, prediction, early warning and preparedness;
- Building capacities to withstand and cope with the hazards and risks;
- Tackling the root causes of the vulnerability such as poverty, poor governance, discrimination, inequality and inadequate access to resources and livelihood opportunities.

The following were recommended policy actions targeting vulnerability reduction:

- The government should improve enforcement of policies aimed at enhancing sustainable environmental health.
- The government through MAAIF should review the animal diseases control act because of low penalties given to defaulters.
- The government should establish systems to motivate support of political leaders toward government initiatives and programmes aimed at disaster risk reduction.
- The government should increase awareness campaigns aimed at sensitizing farmers/ communities on disaster risk reduction initiatives and practices.
- The government should revive disaster committees at district level and ensure funding of disaster and environmental related activities.
- The government through UNRA and the District Authority should fund periodic maintenance of feeder roads to reduce on traffic accidents.
- The government through MAAIF and the District Production Office should promote drought and disease resistant crop seeds.
- The government through OPM and Meteorology Authority should increase importation of lightning conductors and also reduce taxes on their importation.
- The government through OPM and Meteorology Authority should support establishment of disaster early warning systems.
- The government through MWE increase funding and staff to monitor wetland degradation and non-genuine agro-inputs.
- The government through OPM should improve communication between the disaster department and local communities.
- The government through MWE should promote Tree planting along road reserves.
- The government through MAAIF should fund and recruit extension workers at sub-county level and also facilitate them.

**TABLE OF CONTENTS**

## LIST OF FIGURES

## LIST OF TABLES

## LIST OF ACRONYMS

| | |
|---|---|
| BBW | Banana Bacterial Wilt |
| DDMC | District Disaster Management Committee |
| DEM | Digital Elevation Model |
| DLG | District Local Government |
| DRM | Disaster Risk Management |
| DWD | Directorate of Water Development |
| DWRM | Directorate of Water Resources Management |
| ENSO | El Niño Southern Oscillation |
| FGD | Focus Group Discussion |
| GIS | Geographical Information Systems |
| HRV | Hazard Risk Vulnerability |
| KII | Key Interview Informant |
| MAAIF | Ministry of Agriculture Animal Industry and Fisheries |
| MWE | Ministry of Water and Environment |
| NCCP | National Climate Change Policy |
| OPM | Office of the Prime Minister |
| PGIS | Participatory GIS |
| SMCA | Spatial Multi-criteria Analysis |
| STRM | Shuttle Radar Topography Mission |
| UBOS | Uganda Bureau of Statistics |
| UNDP | United Nations Development Program |
| UNRA | Uganda National Roads Authority |
| UTM | Universal Transverse Mercator |
| WGS | World Geodetic System |

## DEFINITION OF KEY TERMS

**Climate change:** Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer).

**Drought:** The phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.

**El Niño:** El Niño, in its original sense, is warm water current that periodically flows along the coast of Ecuador and Peru, disrupting the local fishery. This oceanic event is associated with a fluctuation of the inter tropical surface pressure pattern and circulation in the Indian and Pacific Oceans, called the Southern Oscillation. This coupled atmosphere-ocean phenomenon is collectively known as El Niño Southern Oscillation, or ENSO. During an El Niño event, the prevailing trade winds weaken and the equatorial countercurrent strengthens, causing warm surface waters in the Indonesian area to flow eastward to overlie the cold waters of the Peru Current. This event has great impact on the wind, sea surface temperature, and precipitation patterns in the tropical Pacific. It has climatic effects throughout the Pacific region and in many other parts of the world. The opposite of an El Niño event is called La Niña.

**Flood:** An overflowing of a large amount of water beyond its normal confines.

**Food insecurity:** A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal, or transitory.

**Impact:** Consequences of climate change on natural and human systems.

**Risk:** The result of the interaction of physically defined hazards with the properties of the exposed systems i.e., their sensitivity or vulnerability.

**Susceptibility:** The degree to which a system is vulnerable to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

**Semi-arid:** Ecosystems that have more than 250 mm precipitation per year but are not highly productive; usually classified as rangelands.

**Vulnerability:** The degree of loss to a given element at risk or set of elements at risk resulting from the occurrence of a natural phenomenon of a given magnitude and expressed on a scale from 0 (no damage) to 1 (total damage)" (UNDRO, 1991) or it can be understood as the conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of community to the impact of hazards "(UN-ISDR 2009.)

Also Vulnerability can be referred to as the potential to suffer harm or loss, related to the capacity to anticipate a hazard, cope with it, resist it and recover from its impact. Both

vulnerability and its antithesis, resilience, are determined by physical, environmental, social, economic, political, cultural and institutional factors" (J.Birkmann, 2006)

**Hazard:** A physically defined source of potential harm, or a situation with a potential for causing harm, in terms of human injury; damage to health, property, the environment, and other things of value; or some combination of these (UNISDR, 2009).

# 1. INTRODUCTION

## 1.1 Background

Uganda has over the past years experienced frequent disasters that range from drought, to floods, landslides, human and animal diseases, pests, animal attacks, earthquakes, fires, conflicts and other hazards which in many instances resulted in deaths, property damage and losses of livelihood. With the increasing negative effects of hazards that accompany population growth, development and climate change, public awareness and pro-active engagement of the whole spectrum of stakeholders in disaster risk reduction, are becoming critical.

The Government of Uganda is shifting the disaster management paradigm from the traditional emergency response focus toward one of prevention and preparedness. Contributing to the evidence base for Disaster and Climate Risk Reduction action, the Government of Uganda is compiling a National risk Atlas of hazard, risk and vulnerability conditions in the Country to encourage mainstreaming of disaster and climate risk management in development planning and contingency planning at national and local levels.

Since 2013, UNDP has been supporting the Office of the Prime Minister to develop District Hazard Risk and Vulnerability profiles in the sub-regions of Rwenzori, Karamoja, Teso, Lango, Acholi and West Nile covering 42 districts. During the above exercise, local government officials and community members have actively participated in data collection and analysis. The data collected was used to generate hazard risk and vulnerability maps and profiles. Validation workshops were held in close collaboration with Ministries, District Local Government (DLG), Development Partners, Agencies and academic/research institutions. The developed maps show the geographical distribution of hazards and vulnerabilities up to sub-county level of each district. The analytical approach to identify risk and vulnerability to hazards in the pilot sub-regions visited of Rwenzori and Teso was improved in subsequent sub-regions.

This final draft report details methodological approach for HRV profiling and mapping for Kapchorwa district in Eastern Uganda.

## 1.2 Objectives of the study

The following main and specific objectives of the study were indicated:

### *1.2.1 Main objective*

The main objective of the study was to develop Multi-hazard, Risk and Vulnerability Profile for Kapchorwa District, Eastern Uganda.

### *1.2.3 Specific Objectives*

In fulfilling the above mentioned main objective the following are specific objectives as expected:

i. Collect and analyze field data generated using GIS in close collaboration and coordination with OPM.

ii. Develop District specific multi-hazard risk and Vulnerability profile using a standard methodology.
iii. Preserve the spatial data to enable use of the maps for future information.
iv. Produce age and sex disaggregated data in the HRV maps.

### 1.3 Scope of Work

Through UNDP's Project: *"Strengthening Capacities for Disaster Risk Management and Resilience Building"* the scope of work entailed the following:

i. Collection of field data using GIS in close collaboration and coordination with OPM in Kapchorwa district and quantify them through a participatory approach on a scale of "not reported/ not prone", "low", "medium" and "high".
ii. Analysis of field data and review the quality of each hazard map which should be accompanied by a narrative that lists relevant events of their occurrence. Implications of hazards in terms of their effects on stakeholders with the vulnerability analysis summarizing the distribution of hazards in the district and exposure to multi-hazards in sub-counties.
iii. Compilation of the entire district multi-hazard, risk and vulnerability HRV Profiles in the time frame provided.
iv. Generating complete HRV profiles and maps and developing a database for all the GIS data showing disaggregated hazard risk and vulnerability profiles to OPM and UNDP.

### 1.4 Justification

The government recognizes climate change as a big problem in Uganda. The draft National Climate Change Policy (NCCP) notes that the average temperature in semi-arid climates is rising and that there has been an average temperature increase of 0.28°C per decade in the country between 1960 and 2010. It also notes that rainfall patterns are changing with floods and landslides on the rise and are increasing in intensity, while droughts are increasing, and now significantly affect water resources, and agriculture (MWE, 2012). The National Policy for Disaster Preparedness and Management (Section 4.1.1) requires the Office of the Prime Minister to "Carry out vulnerability assessment, hazard and risk mapping of the whole country and update the data annually". UNDP's DRM project 2015 Annual Work Plan; Activity 4.1 is "Conduct national hazard, risk and vulnerability (HRV) assessment including sex and age disaggregated data and preparation of district profiles."

### 1.5 Structure of the Report

This Report is organized into five sections: Section 1 provides Introduction on the assignment. Section 2 elaborates on the overview of Kapchorwa district. Section 3 focuses on the methodology employed. Section 4 elaborates the Multi-hazard, Risks and Vulnerability profile and Coping strategies for Kapchorwa district. Section 5 describes Conclusions and policy related recommendations.

## 2. OVERVIEW OF KAPCHORWA DISTRICT

### 2.1 Location

Kapchorwa District is located between coordinates: 1° 24' 0" N, and 34° 27' 0" E in Eastern Uganda. The district is bordered by Kween District to the northeast and east, and Bulambuli District to the west and northwest. This district is made up of one county (Tingey); has 11 sub-counties and one Municipality made up of 3 Divisions. Sub-counties are; Amukol, Chema, Cheptarich, Gamogo, Kabeywa, Kapsinda, Kaptanya, Kaserem, Kawowo, Munarya, Sipi and Kapchorwa municipality divisions are, Central Division, Eastern Division (Kapchesombe s/county & 2 Parishes of Kaptanya s/county i.e. Siron & Kirwoko), Western Division (Tegeres s/county & Kapteret s/county).

The district headquarters is located in the central division of the newly created Kapchorwa Municipality. The District has a total area of 517 square kilometers and is situated 287 KM eastwards from the capital city -Kampala.

Figure 1 shows the Administrative boundaries and gazetted areas of Kapchorwa District.

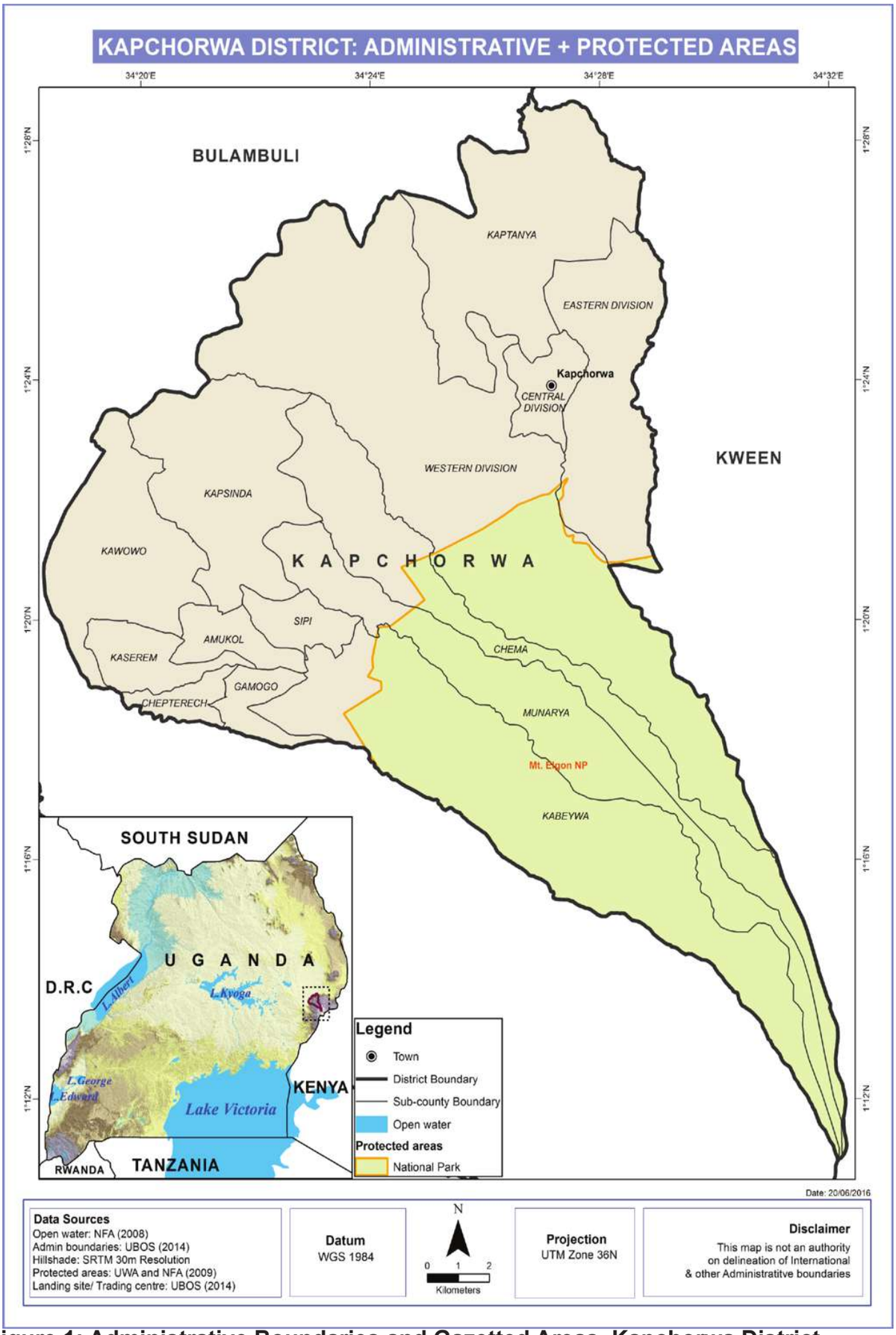



**Figure 1: Administrative Boundaries and Gazetted Areas, Kapchorwa District**

*2.1.1 Geomorphology*

The District is generally hilly with steep slopes, valleys, radial drainage with Sipi being the main river and a number of other rivers and stream flowing Northwards from Mt. Elgon.

The district has three zones namely; the lowlands, midland and highland. The low land is covering mainly Kawowo and Kaserem sub- counties occupying an area of approximately 1/3 of the entire district and lies in an altitude of 1000 - 1300m above sea level. The average land holding in this area per household is 5 acres. The second is the middle zone that has high steep slopes and adequate/reliable rainfall with an altitude of 1400m above sea level. The third zone is the high altitude which is between 1400 -2300. Mixed mountainous forests are found at an altitude less than 2500mm. Above this is mainly the protected area, the Mount Elgon National park. Bamboo and low canopy mountainous forest are found between 2400m to 3500m. Moorland is found above altitude 3500m.

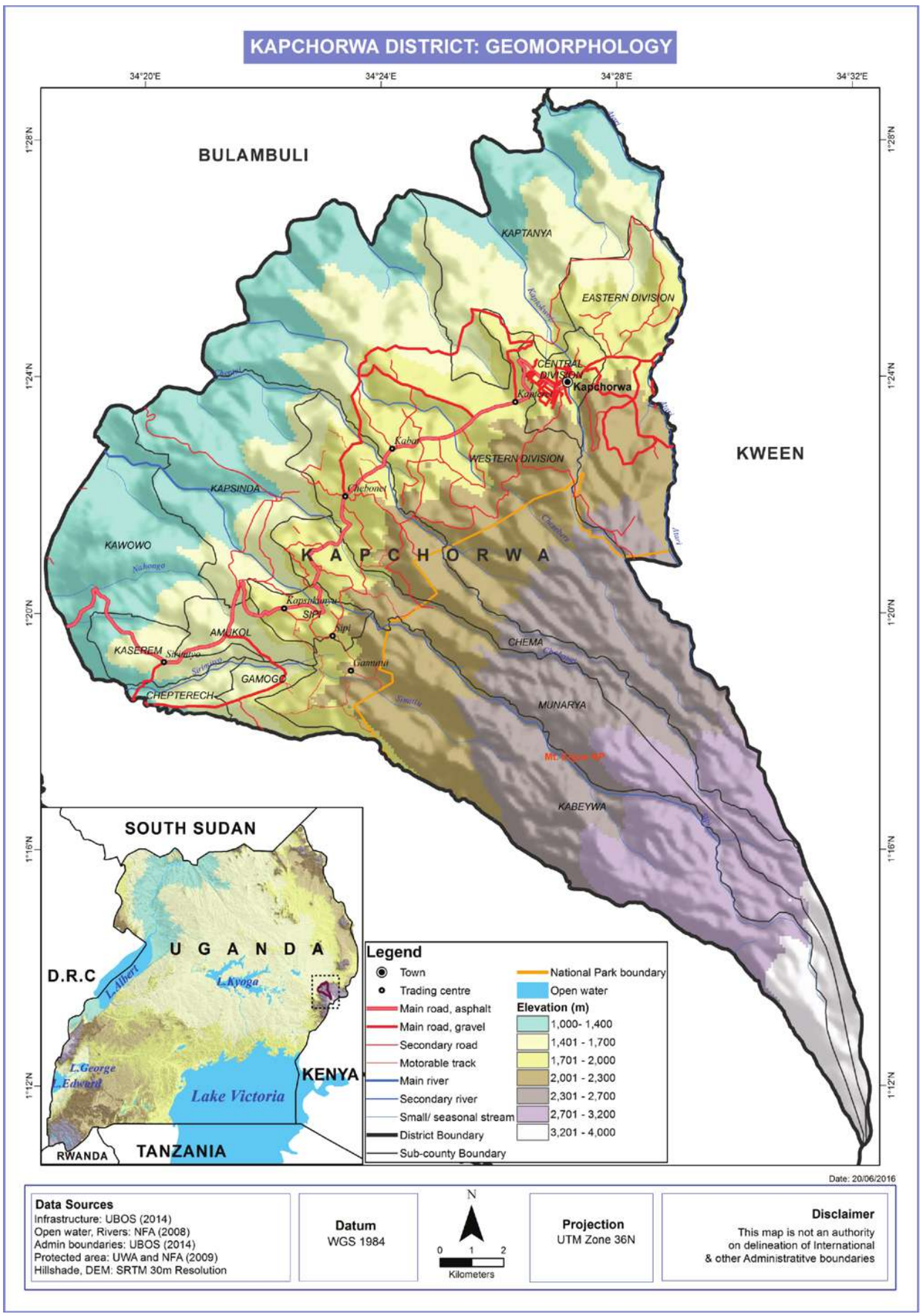



**Figure 2: Geomorphology, Kapchorwa District**

*2.1.2 Soils and Geology*

Mt. Elgon is underlain by Mesozoic and Cainozoic rocks comprising of mainly volcanics and sediments. They are generally soda-rich agglomerates, lavas and tuffs that have been extruded. Much as the rocks belong to ancient rock systems, volcanic intrusions have occurred leading to material flows forming sediments in valleys rich in volcanic ash. Due to prolonged exposure weathering of volcanic ash has occurred releasing rock fragments ranging from cobbles to massive boulders that either lie on the slopes or are embedded in soils. Soils on the slopes of Mt. Elgon are mainly classified as Acrisols, Ferralsols, Nitisols and Luvisols. On higher altitudes in the forest belt soils are brown to red-brown clay-loams, up to a meter or so deeper. Above 3,000m, however, shallow black humus soils predominate. These soils are relatively young and fertile with high concentration of calcium, sodium, and potassium.

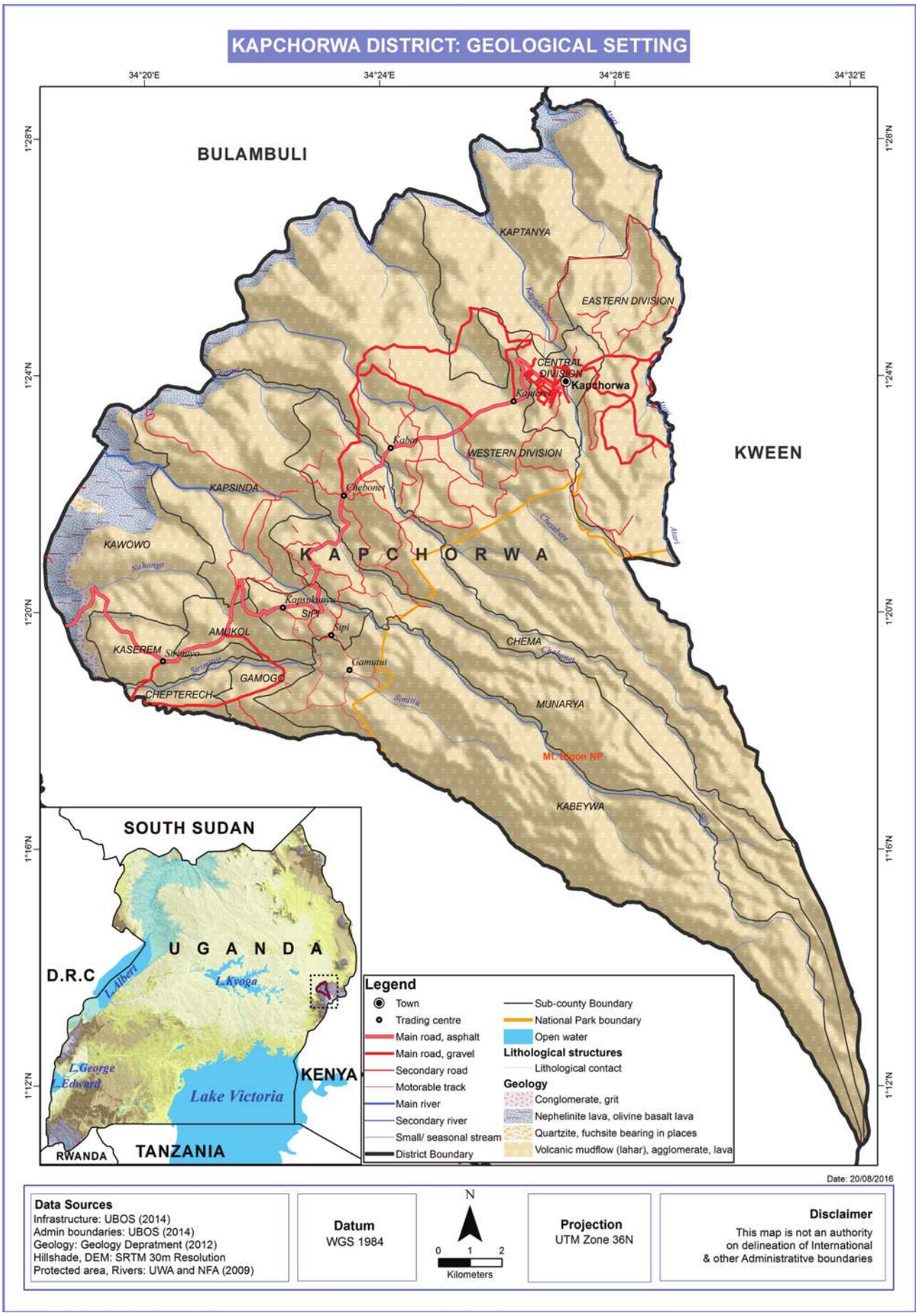



**Figure 3: Geology and Lithological Structures, Kapchorwa District**

### *2.1.3 Vegetation and Land use Stratification*

Mixed mountainous forests are found at altitude less than 2500m. Bamboo and low canopy mountainous forest are found between 2400m to 3500m. Moorland is found above altitude 3500m. Open savannah to the North of the District is sparsely populated due to Cattle rustling.

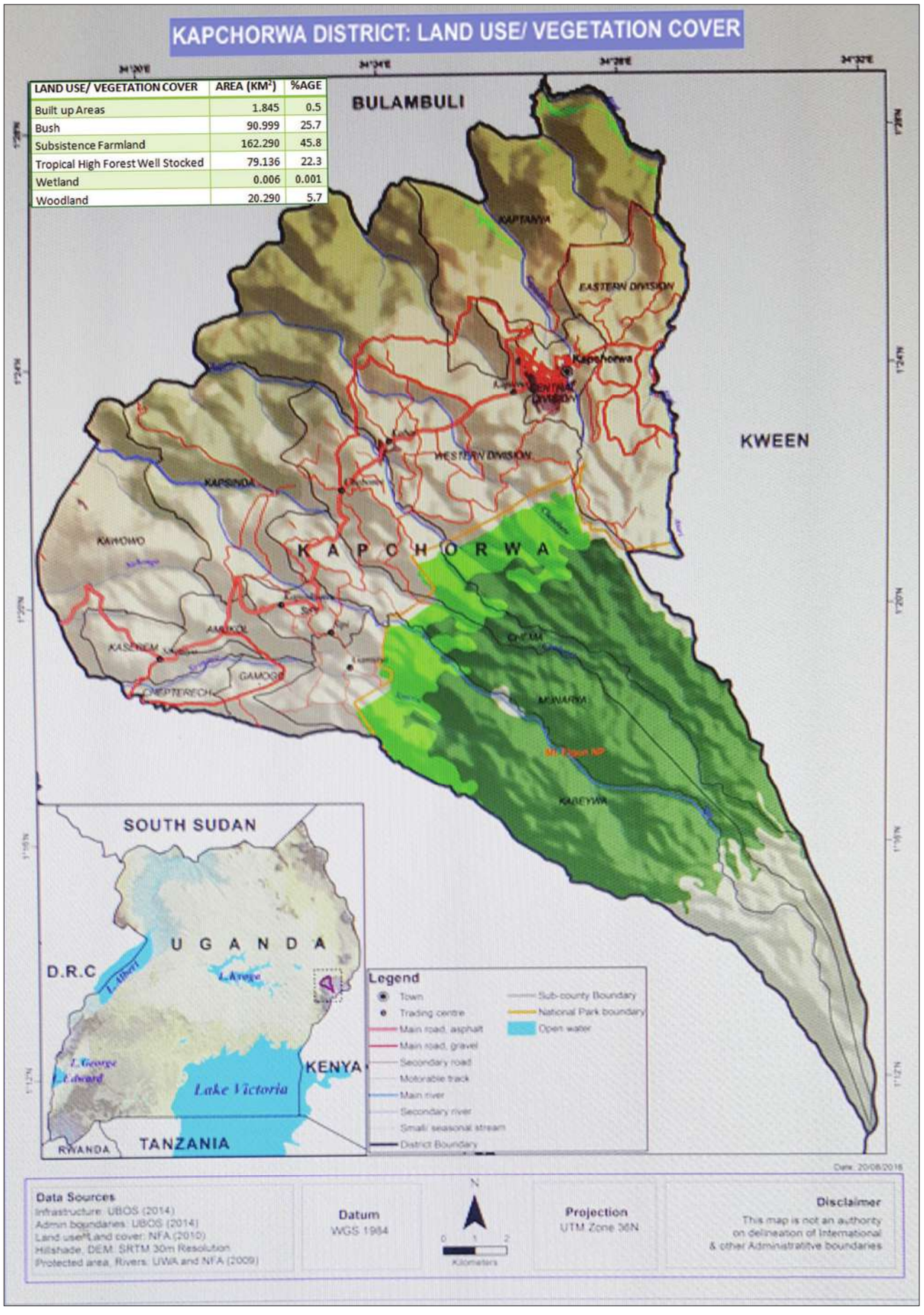



**Figure 4: Land use Stratification, Kapchorwa District**

### *2.1.4 Temperature and Humidity*

The temperatures in the district are not felt as it was in the early 70s which used to be misty/cloudy throughout the rainy season. Possibly due to the effects of the climate change temperatures have changed and mist is not frequent with wormer temperatures are experienced.

However, The mean minimum temperatures in Kapchorwa district vary from 10$^{o}$C to 14oC, while the mean maximum temperatures vary from 20$^{o}$C to 25$^{o}$C.

### *2.1.5 Wind*

The north- east monsoon winds are strong during dry season, its climax is in the months of Dec – March. It is characterized by simple cyclones causing a lot of wind erosion and dusty conditions. House roofs are occasionally carried off roofs of building. In 2014, it carried Tariate primary school in Kwoti, eastern division. Bananas fruiting during this season are felled down. Bananas are highly affected by wind compared to any other crops in the district during this season.

### *2.1.6 Rainfall*

Average Rainfall per annum lies between 920mm – 1650mm and is usually received during the months of June-August. The district experiences dry windy conditions in December–February while occasional storms are experienced.

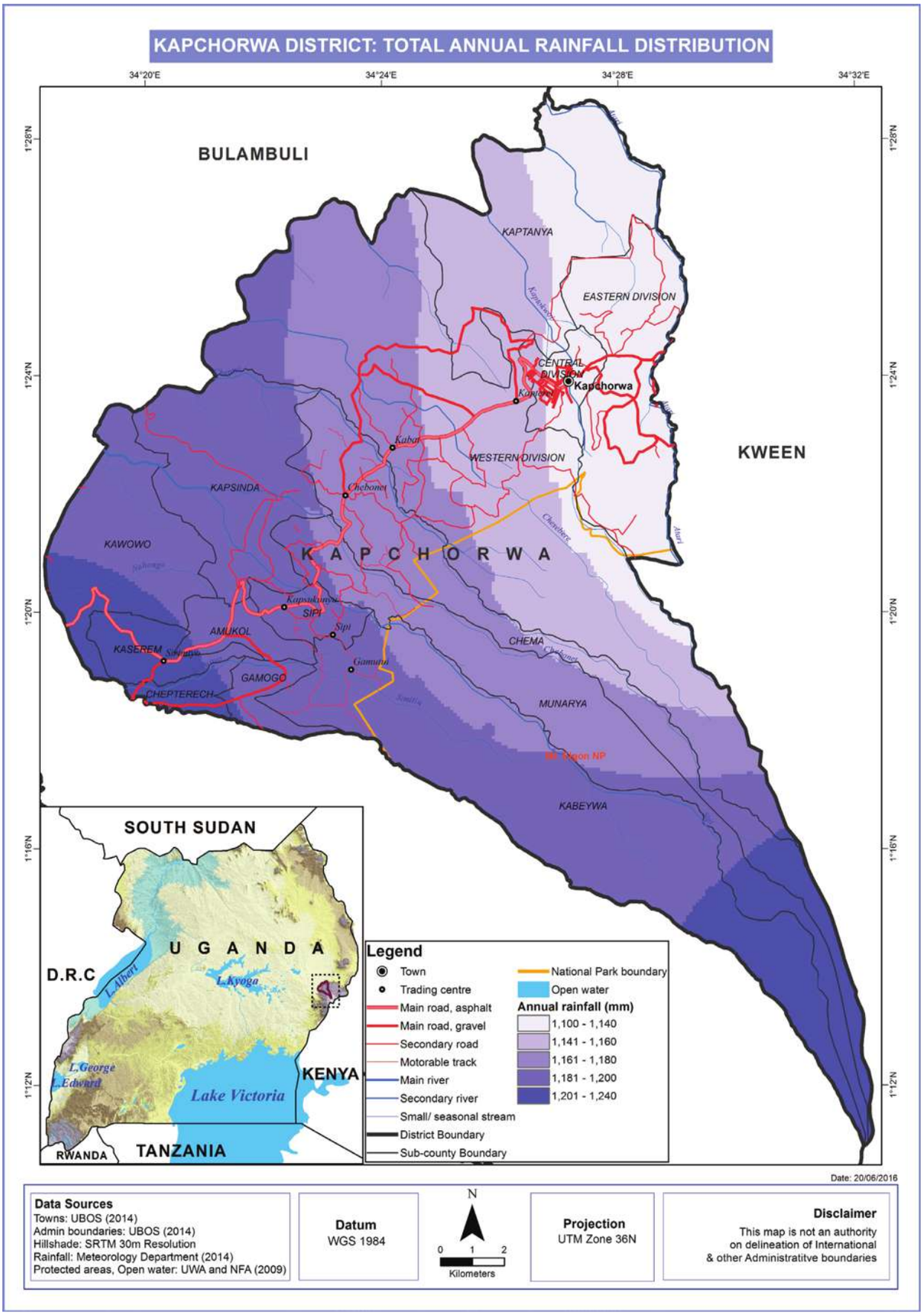



**Figure 5: Total Annual Rainfall Distribution, Kapchorwa District**

*2.1.7 Hydrology*

The District has five wetlands (Tartar and Kawoyon in Kaptanya S/C, Kuporit and Kapteka in Kapsinda S/C), Chemosong in chema sub-county some of which are seasonal (chemosong). There are seven main rivers which flow from Mt Elgon down wards in the northerly direction to plains. The rivers are: River Sirimityo, River Sipi, River Chebonet, River Cheptui, River Cheseber, River Kaptokwoi and River Atari. However, in between them are several streams. Some streams are permanent and others are seasonal. There are several protected springs and wells spread throughout the district

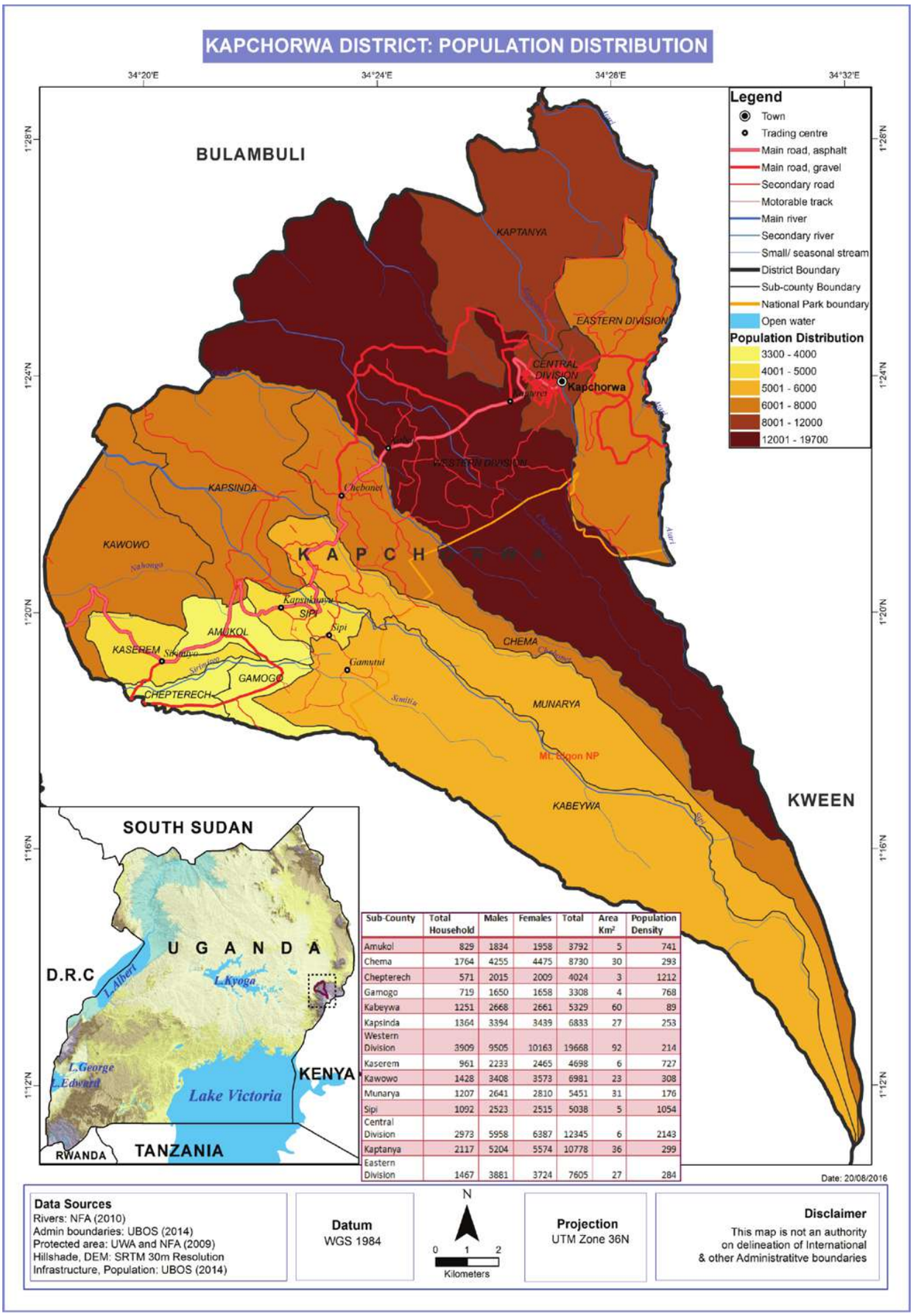
*2.1.8 Population*

According to the National Population and Housing Census (2014) provisional results, Kapchorwa District had a total population of 104,580 people. Results also showed that most of the people in Kapchorwa District reside in rural areas (92,235 (88.2%) compared to (12,345 (11.8%) who reside in urban centers. The gender distribution was reported to be males: 51,169 (48.9%) and females: 53,411 (51.1%). About 99.3% (103,808) of the population form the household population and only 0.7% (772) is Non-household. Kapchorwa Town council had the highest population of 12,345 people while Gamogo sub-county had the least population of 3,308 people (Figure 6). Table 1 shows the population distribution per sub-county for the different gender.

**Table 1: Population Distribution in Kapchorwa District**

| SUB-COUNTY | HOUSEHOLDS | | POPULATION DISTRIBUTION | | | | |
|---|---|---|---|---|---|---|---|
| | *Number* | *Av. Size* | *Males* | *Females* | *Total* | *Area* | *Population Density* |
| **Amukol** | 829 | 4.6 | 1834 | 1958 | 3792 | 5.1 | 741 |
| **Chema** | 1764 | 4.9 | 4255 | 4475 | 8730 | 29.8 | 293 |
| **Chepterech** | 571 | 7.0 | 2015 | 2009 | 4024 | 3.3 | 1212 |
| **Gamogo** | 719 | 4.6 | 1650 | 1658 | 3308 | 4.3 | 768 |
| **Kabeywa** | 1251 | 4.3 | 2668 | 2661 | 5329 | 59.6 | 89 |
| **Kapsinda** | 1364 | 5.0 | 3394 | 3439 | 6833 | 27.0 | 253 |
| **Western Division** | 3909 | 5.0 | 9505 | 10163 | 19668 | 92.0 | 214 |
| **Kaserem** | 961 | 4.9 | 2233 | 2465 | 4698 | 6.5 | 727 |
| **Kawowo** | 1428 | 4.9 | 3408 | 3573 | 6981 | 22.6 | 308 |
| **Munarya** | 1207 | 4.5 | 2641 | 2810 | 5451 | 31.0 | 176 |
| **Sipi** | 1092 | 4.6 | 2523 | 2515 | 5038 | 4.8 | 1054 |
| **Central Division** | 2973 | 4.0 | 5958 | 6387 | 12345 | 5.8 | 2143 |
| **Kaptanya** | 2117 | 5.1 | 5204 | 5574 | 10778 | 36.1 | 299 |
| **Eastern Division** | 1467 | 5.2 | 3881 | 3724 | 7605 | 26.8 | 284 |
| **TOTAL** | 21652 | | 51169 | 53411 | 104580 | 355 | 295 |

*Source: UBOS Census 2014*




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 6: Population Distribution, Kapchorwa District**

*2.1.9 Economic activities*

The main economic activity in the District is Agriculture service industry and trading
The District is very productive in agricultural products and is a food basket to most of the Districts in Uganda. Most people in the district produce crops for commercial purposes and little is left for home consumption. Cash crops like coffee, Burley and wheat are purely for cash. The main crops grown are coffee, maize, beans, barley, wheat, matooke, Irish Potatoes, millet, Sun flower, cow peas and passion fruit.

Other economic activities include agro-processing of mainly maize and coffee. Livestock farming – cows, sheep, goats, donkeys and pigs. Also poultry, bee keeping and eco - tourism among other economic activities are also practiced in the District. Vegetable growing has greatly increased with markets as far as Southern Sudan. They include Cabbages, Onions, Carrots, Tomatoes and Sukuma, Other petty trade and transport business is common.

Quarrying (Rock mining): this is done in Kawowo and Kapsinda sub-counties for mining of pozzolona for cement making by Tororo cement in Chemakalal village Kawowo sub-county and Kampala International cement industry in Kapsinda sub-county. Exploration indicates that the whole Kawowo, Kapsinda, Lower Kaptanya, Lower Kapteret are a potential for cement industry

## METHODOLOGY

### 3.1 Collection and analysis of field data using GIS

*3.1.1 Preliminary spatial analysis*

Hazard prone areas base maps were generated using Spatial Multi-Criteria Analysis (SMCA) basing on numerical models and guidelines using existing environmental and socio-ecological spatial layers (i.e. DEM, Slope, Aspect, Flow Accumulation, Land use, vegetation cover, hydrology, soil types and soil moisture content, population, socio-economic, health facilities, accessibility, and meteorological data) in a GIS environment (ArcGIS 10.1).

*3.1.2 Stakeholder engagements*

Stakeholder engagements were carried out in close collaboration with OPM's DRM team and the district disaster management focal persons with the aim of identifying the various hazards ranging from drought, to floods, landslides, human and animal disease, pests, animal attacks, earthquakes, fires, conflicts etc. Stakeholder engagements were done through Focus Group Discussions (FGDs) and key informant interviews guided by checklist tools (Appendix I). At district level, One Key Informant Interview comprising of three respondents (Senior District Agricultural Officer, District Natural Resources Officer and District Planner) was held at Kapchorwa District Headquarters. At sub-county level Key informants included: Sub-county and parish chiefs, community Development mobilizers and health workers.

FGDs were carried out in five purposively selected sub-counties that were ranked with highest vulnerability. FGDs comprising of an average of 12 respondents (crop farmers, local leaders, nursing officers, police officers and cattle keepers) were conducted at Kawowo Sub-county, Kapchesombe Sub-county, Kaptanya Sub-county, Kapsinda Sub-county. Each Parish of the selected Sub-counties was represented by at least one participant and the selection of participants was engendered. FGDs were conducted with utmost consideration to the various gender categories (women, men) with respect to age groups since hazards affect both men and women though in different perspectives irrespective of age. This allowed for comprehensive representation as well as provision of detailed and verifiable information.

Focus Group discussions and Key Informant Interviews were transcribed in the field for purposes of input into the NVIVO software for qualitative data analysis. Case stories and photographs were documented and captured respectfully. In order to produce age and sex disaggregated data, results from FGDs and KIIs were integrated with the district population census data. This was also input in the multi-hazard, risk and vulnerability profile maps.

*3.1.3 Participatory GIS*

Using Participatory GIS (PGIS), local communities were involved in identifying specific hazards prone areas on the Hazard base maps. This was done during the FGDs and participants were requested through a participatory process to develop a community hazard profile map.

*3.1.4 Geo-referencing and ground-truthing*

The identified hazard hotspots in the community profile maps were ground-truthed and geo-referenced using a handheld Spectra precision Global Positioning System (GPS) unit, model: Mobile Mapper 20 set in WGS 1984 Datum. The entities captured included: hazard location, (Sub-county and parish), extent of the hazard, height above sea level, slope position, topography, neighboring land use among others (Appendix I). Hazard hot spots, potential and susceptible areas will be classified using a participatory approach on a scale of “not reported/ not prone”, “low”, “medium” and “high”. This information generated through a participatory and transect approach was used to validate modelled hazard, risk and vulnerability status of the district. The spatial extent of a hazard event was established through modelling and a participatory validation undertaken.

**3.2 Develop District Specific Multi-hazard Risk and Vulnerability Profiles**

*3.2.1 Data analysis and integration*

Data analysis and spatial modeling was done by integrating spatial layers and non-spatial attribute captured from FGDs and KIIs to generate final HRV maps at Sub-county level. Spatial analysis was done using ArcGIS 10.1 to generate specific hazard, risk and vulnerability profile for the district.

**3.3 Preserve the Spatial data to enable future use of the maps**

HRV profiles report and maps have been verified and validated, final HRV profiles inventory and geo-database have been prepared containing all GIS data in various file formats to enable future use of the maps.

*3.3.1 Data verification and validation*

In collaboration with OPM, a five days regional data verification and validation workshop was organized by UNDP in Mbale Municipality as a central place within the region. This involved key district DDMC focal persons for the purpose of creating local/district ownership of the profiles.

## RESULTS FROM MULTI-HAZARD RISK, VULNERABILITY MAPPING

### 4. Multi-hazards

A hazard, and the resultant disaster can have different origins: natural (geological, Hydro-meteorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity, frequency, probability, duration, area of extent, speed of onset, spatial dispersion and temporal spacing (Cees, 2009).

In the case of Kapchorwa district, hazards were classified following main controlling factors:

i. Geomorphological or Geological hazards including; landslides, rock falls and soil erosion
ii. Climatological or Meteorological hazards including; floods, drought, hailstorms, strong winds and lightning
iii. Ecological or Biological hazards including; crop pests and diseases, livestock pests and diseases, human epidemic diseases, vermin attacks and wildlife animal attacks,
iv. Human induced or Technological hazards including; bush fires, road accidents land conflicts.

### 4.1 Geomorphological and Geological Hazards

*4.1.1 Landslides, rock falls and soil erosion*

Results from the participatory assessments indicated that landslides, mudslides, rock falls and soil erosion were experienced in Kapchorwa district. It was observed that landslides occur in the rainy season. It was reported that when landslides occur, houses and crops are severely destroyed and roads are also blocked. In early 2016, landslides blocked the Kapchorwa – Kween road. It was also reported that in 2014 a banana plantation was washed away in Rukola parish, Gamogo sub-county. In 2007, a child and his mother were killed by a landslide in central division. In Aug 2011 landslides were experienced in the whole district. A landslide in Gamogo S/C (Approx 100 x 300m$^2$) buried 3 houses, in Chema sub-county the landslide killed a one year old child and the mother survived in hospital but all the houses buried and several animals injured and in Sipi Sub-county, chebukoch village, a widow and 5 children were injured with dislocations and her house buried by mad flow. Patches of small landslides with rampant soil erosion affected most parts of Kapchesombe sub- county (eastern division).

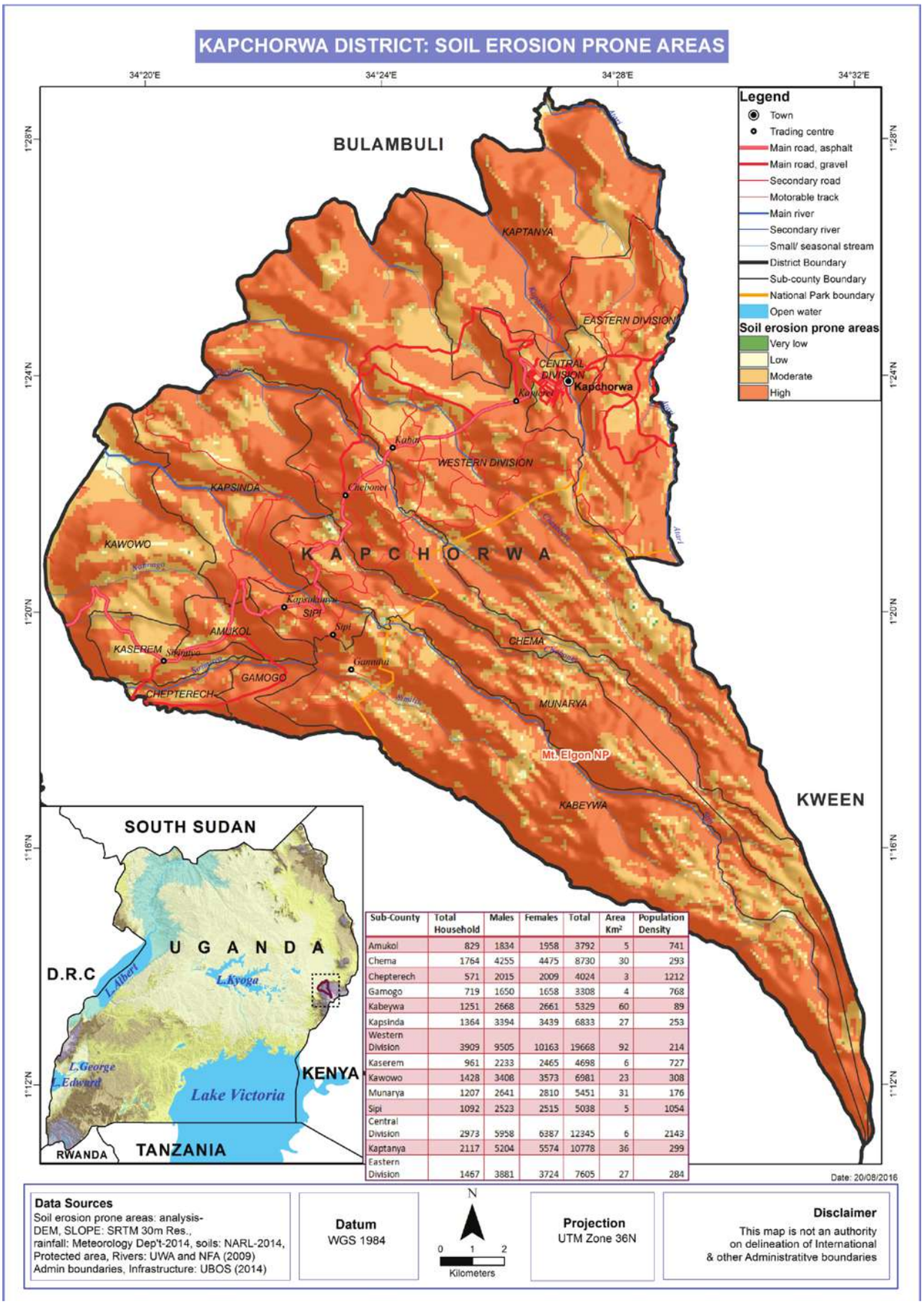
The most affected sub-counties include; Gamogo, Sipi, Chema, Kaptanya and Kapchesombe

**A table showing a summary of the HHs affected by landslides per subcounty in August 2011in Kapchorwa district.**

**Key:** HH = House hold, S/C: Sub-county

| | Name of sub-county | No of the villages affected | No. of HH affected | No of pple in the HHs | No of hosting HHs in the S/C to the displaced as emergency |
|---|---|---|---|---|---|
| 1 | Gamogo | 5 | 265 | 953 | 226 |
| 2 | Tegeres | 1 | 5 | 37 | 3 |
| 3 | Kapchesombe | 11 | 63 | 316 | --------- |
| 4 | Chema | 1 | 1 | 6 | 1 |
| 5 | Sipi | 1 | 8 | 7 | --------- |
| **Total** | **5** | **19** | **342** | **1,319** | **230** |

This information was integrated with the spatial modelling using socio-ecological spatial data i.e. Soil texture (data for National Agricultural Research Laboratories – Kawanda (NARL) 2014, Rainfall (Meteorology Department 2014), Digital Elevation Model (DEM), SLOPE, ASPECT (30m resolution data from SRTM Shuttle Radar Topography Mission (SRTM) to generate Land slide, rock falls and soil erosion vulnerability map (Figure 7).

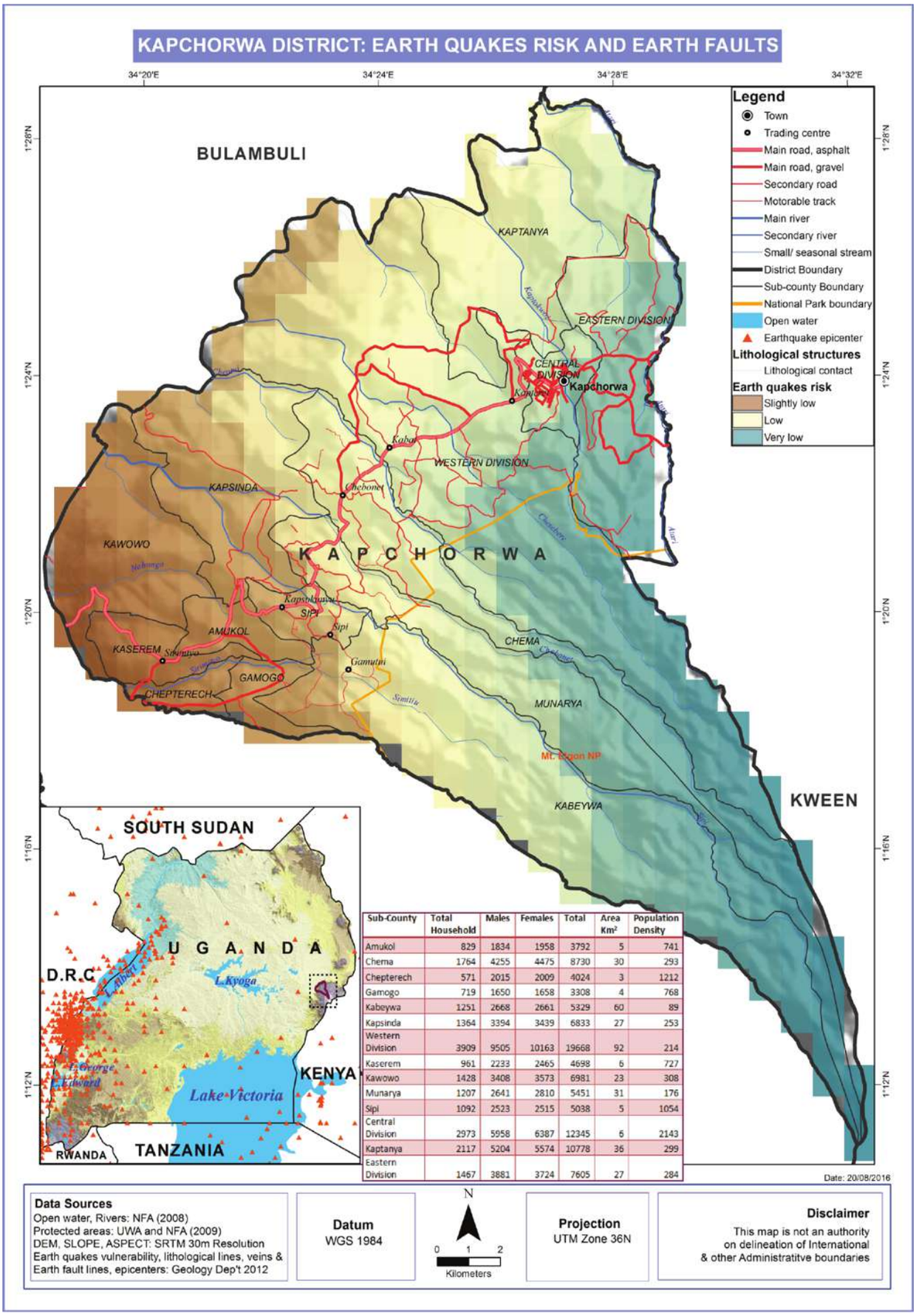



| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 7: Landslides, Rock fall and Soil erosion Prone Areas, Kapchorwa District**

### *4.1.2 Earthquakes and faults*

Participants in the focus group discussions indicated that Kapchorwa district experiences earth tremors occasionally. It was observed that these earth tremors are not serious and thus do not cause any damage to houses. However, participants reported that a crack on a cliff in Eastern division in Moron parish  is widening thus putting the residents of this area at risk.




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 8: Earthquakes Vulnerability and Fault lines, Kapchorwa District**

## 4.2 Climatological and Meteorological Hazards

### *4.2.1 Floods*

Participants in the focus group discussions indicated that floods are a common occurrence in Kapchorwa district during the rainy seasons. It was noted that these floods mainly occur along rivers and in the low land areas. It was reported that in early 2016, River Kaptakwoi in central division, burst its banks causing flooding and families were displaced. The most affected sub-counties include; Kawowo, Sipi and Kapchorwa central division. This information was integrated with the spatial modelling using socio-ecological spatial data i.e. Soil texture (data for National Agricultural Research Laboratories – Kawanda (NARL) 2014, Rainfall (Meteorology Department 2014), Digital Elevation Model (DEM), SLOPE, ASPECT (30m resolution data from SRTM Shuttle Radar Topography Mission (SRTM) to generate flood susceptibility map. Figure 9 shows areas susceptible to floods.

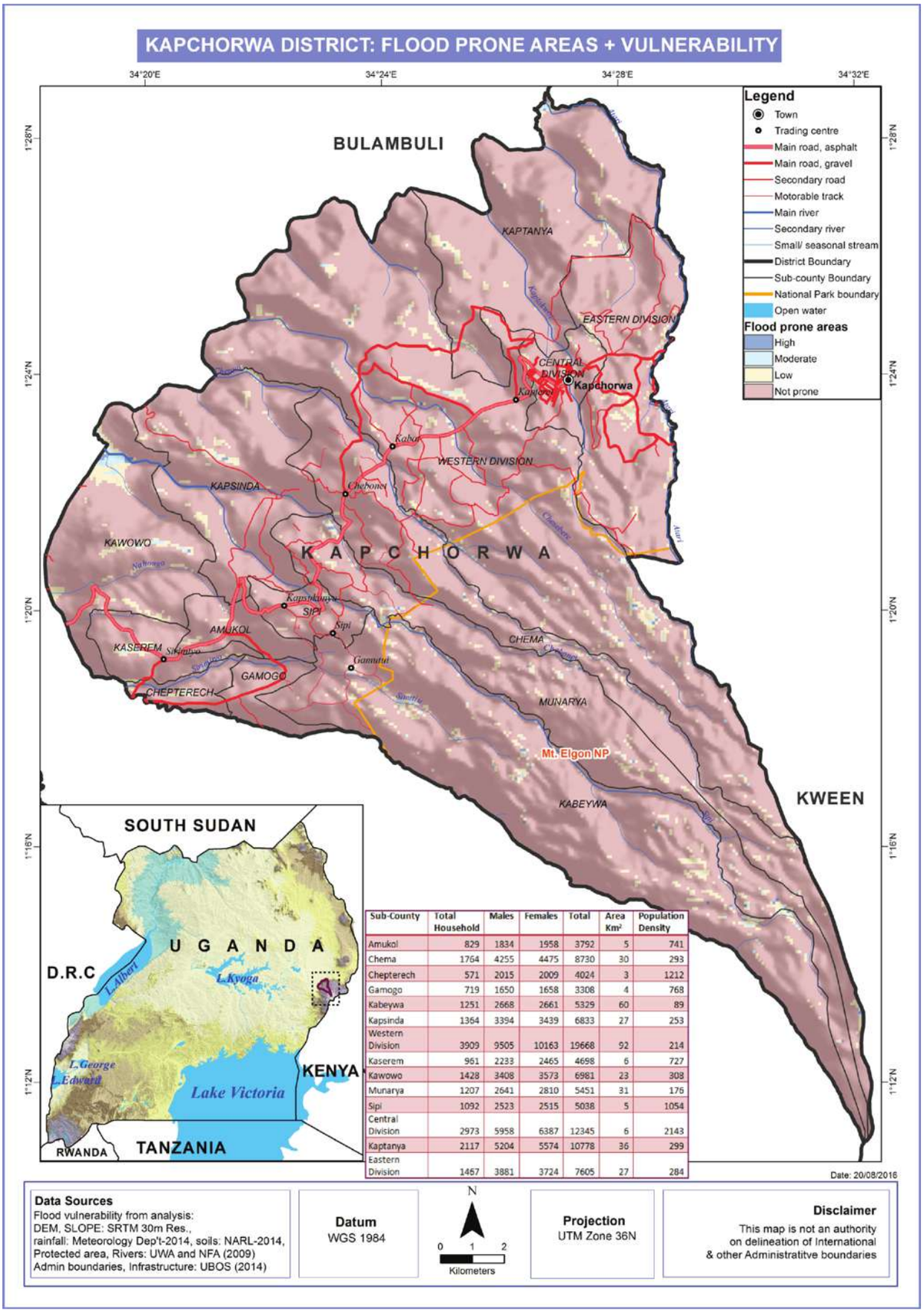
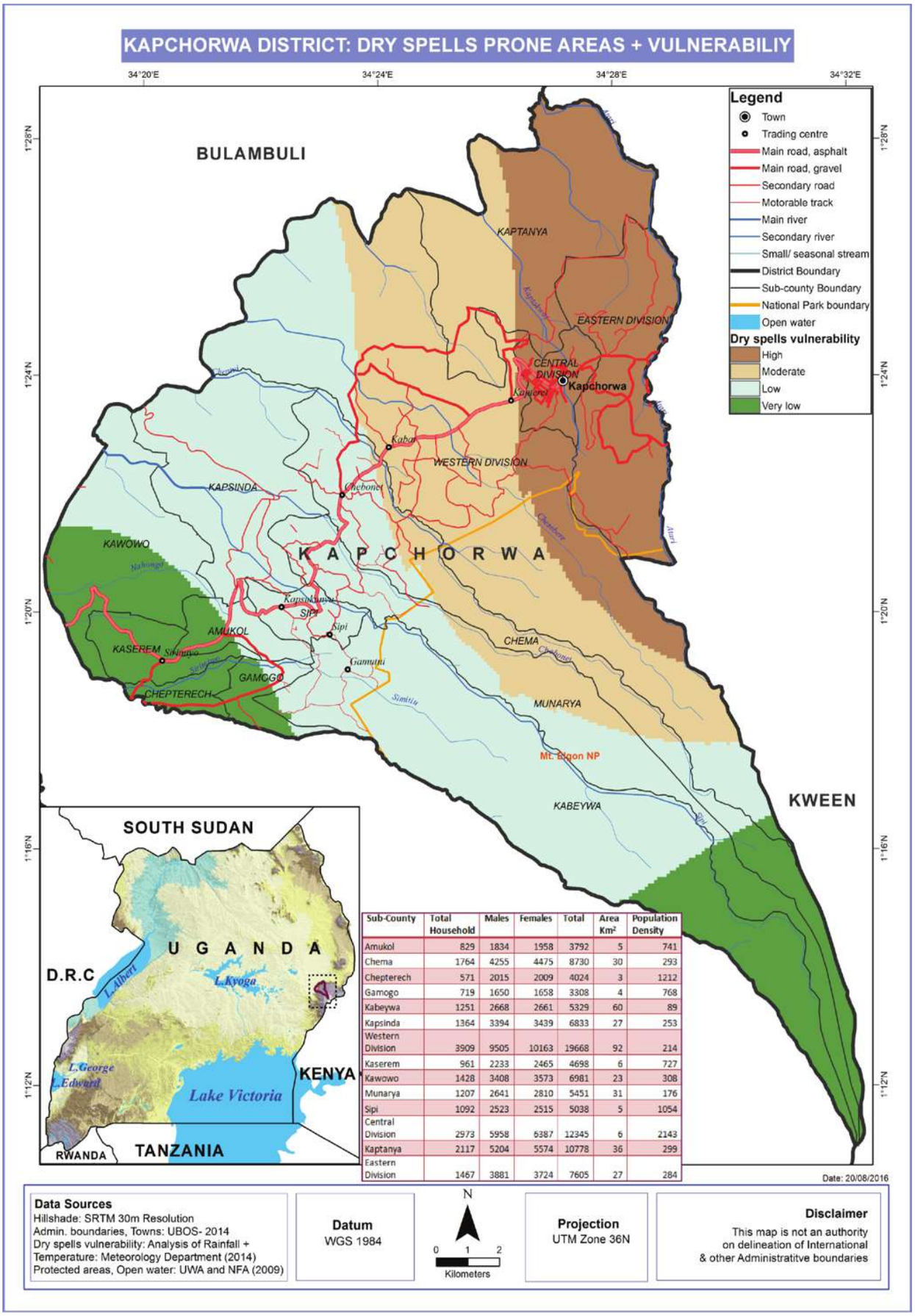



**Figure 9: Flood Prone Areas and Vulnerability Ranking, Kapchorwa District**

*4.2.2 Prolonged Dry spells*

Results from participatory assessments indicated that droughts in form of prolonged dry spells without rain are experienced in Kapchorwa district. It was reported that these prolonged dry spells are more evident in January every year. However, it was pointed out that Kawowo, low altitude parts of Kaptanya subcounty, Tegeres and Kapteret in western division, Kaserem sub-county are the most affected by the prolonged dry spells. Some of the effects of these dry spells include; crop failures, increased incidences of pests and diseases. This information was integrated with spatial modelling using socio-ecological spatial data i.e. Rainfall and Temperature (Uganda National Meteorological Authority, 2014) using the Standardized Precipitation Index (SPI) to generate drought vulnerability map. Figure 10 shows areas that are affected by drought and their ranking.




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 10: Dry spells Prone Areas and Vulnerability Ranking, Kapchorwa District**

### *4.2.3 Hailstorms*

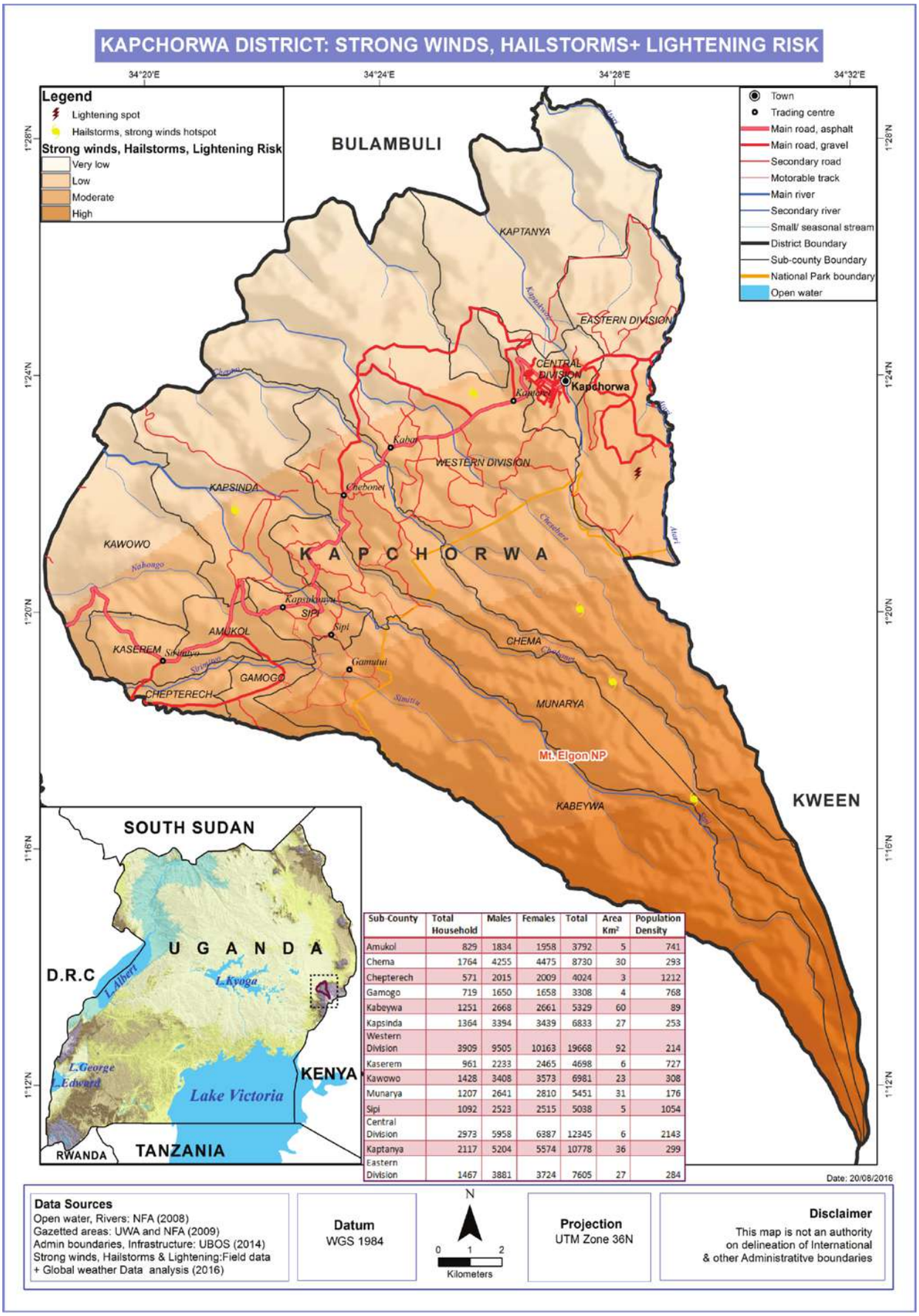
Participatory assessments through the focus group discussions indicated that hailstorms are a common occurrence in Kapchorwa district and are experienced during rainy seasons. Participants reported that hailstorms usually cause serious damage to crops especially banana plantations. Though it was reported that the entire district is affected by hailstorms, the most affected sub-counties are; Kapchesombe, Kawowo, Tegeres, Kapteret, chema, munarya, and Kapsinda (Figure 11).

### *4.2.4 Strong winds*

Results from participatory assessments showed that strong winds were also a serious problem in the district during rainy seasons. It was reported that strong winds usually blow off roof tops of houses and schools and banana plantations. The most affected sub-counties are; Kapchorwa municipality (Figure 11).

### *4.2.5 Lightning*

Lightning is a sudden high-voltage discharge of electricity that occurs within a cloud, between clouds, or between a cloud and the ground. The distribution of lightning on Earth is far from uniform. The ideal conditions for producing lightning and associated thunderstorms occur where warm, moist air rises and mixes with cold air above. Participants in the focus group discussions mentioned that lightning was a serious problem in Kapchorwa district. Animals, some people and trees were hit by lightning in Kapchesombe sub-county. Kwoti parish in Kapchesombe upper was the most affected (Figure 11).




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 11: Strong winds, Hailstorms and Lightning Hotspots and Vulnerability, Kapchorwa District**

### 4.3 Ecological and Biological Hazards

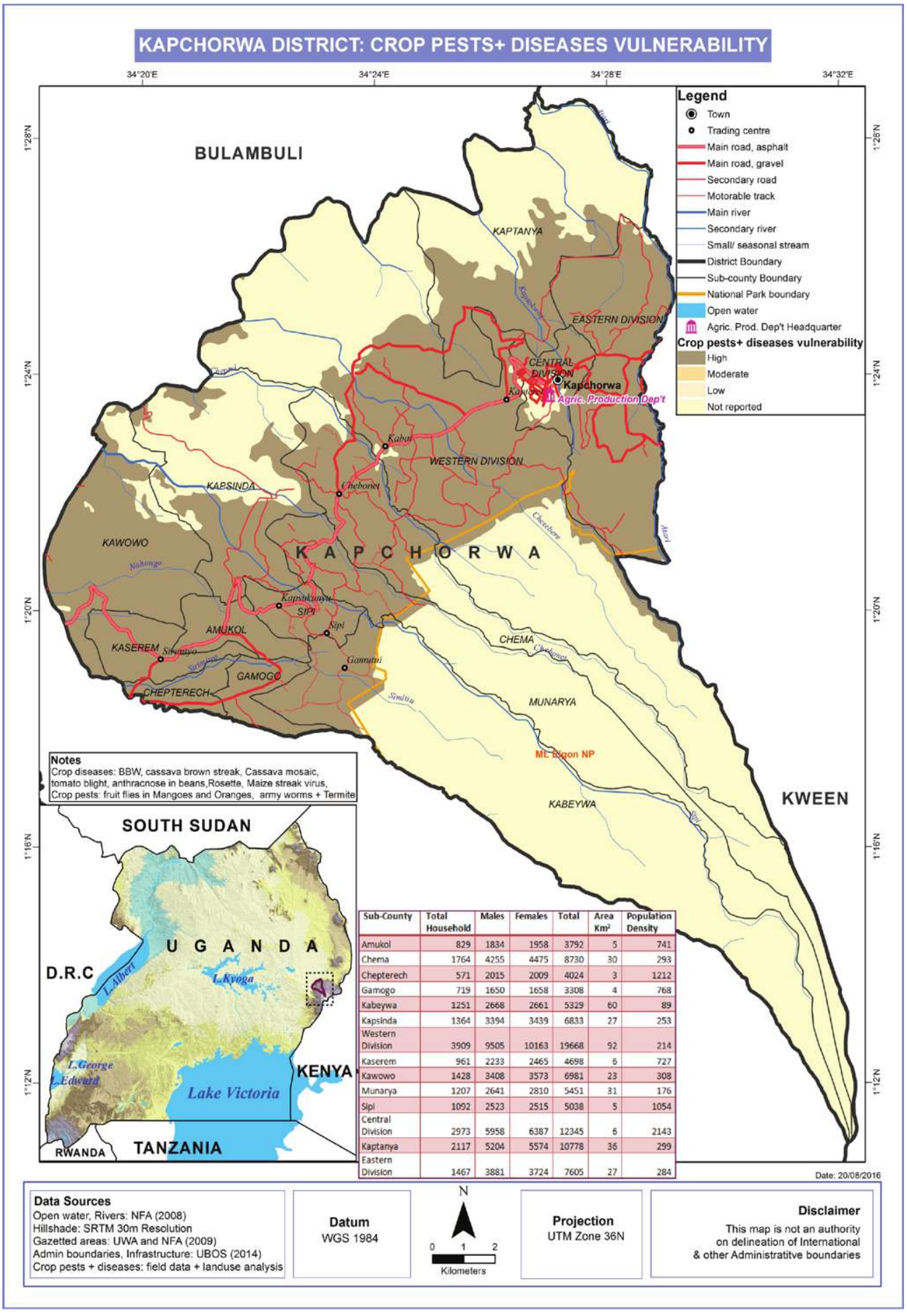
*4.3.1 Crop Pests and Diseases*

Results from participatory assessments indicated that Kapchorwa district is prone to crop diseases and pests (Figure 12). The most common crop pests and diseases in the district are shown in the table below;

**Table 2: Common Crop diseases and pests**

| CROP | DISEASES | PESTS |
|---|---|---|
| **Banana** | Banana Bacterial Wilt | Banana weevil |
| **Coffee** | Coffee berry disease. | Coffee stem borers, coffee twig borers |
| **Maize** | Maize streak virus | Maize stalk borer, Termites |
| **Beans** | Bean root rot | Weevils, aphids |
| **Tomatoes** | Blight | Aphids |
| **Sweet and Irish potatoes** | Blight | Weevils and caterpillars |

*Source: Department for Production 2014*




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 12: Crop Pests and Diseases Vulnerability, Kapchorwa District**

*4.3.2 Livestock Parasites, Vectors and Diseases*

Results from the focus group discussions showed that livestock pests and diseases were a common occurrence in Kapchorwa district (Figure 13). The most affected sub-counties include; Kaptanya and Eastern division in Kapchorwa Town council. The most common livestock pests and diseases in the district are shown in the table below;

**Table 3: Common Livestock Diseases and Pests**

| LIVESTOCK | DISEASE | PARASITES + VECTORS |
|---|---|---|
| Cattle<br>Goats<br>Sheep<br>Pigs<br><br>Paultry | Foot and mouth disease, East Coast Fever and Mastitis, FMD, Black quarter<br><br>Swine fever<br>Newcasle, coccidiosis, | Intestinal worms, ticks, tsetse flies and nuisance flies,<br><br>Jiggers, mites, lice<br>worms |

*Source: Department for Production 2014*

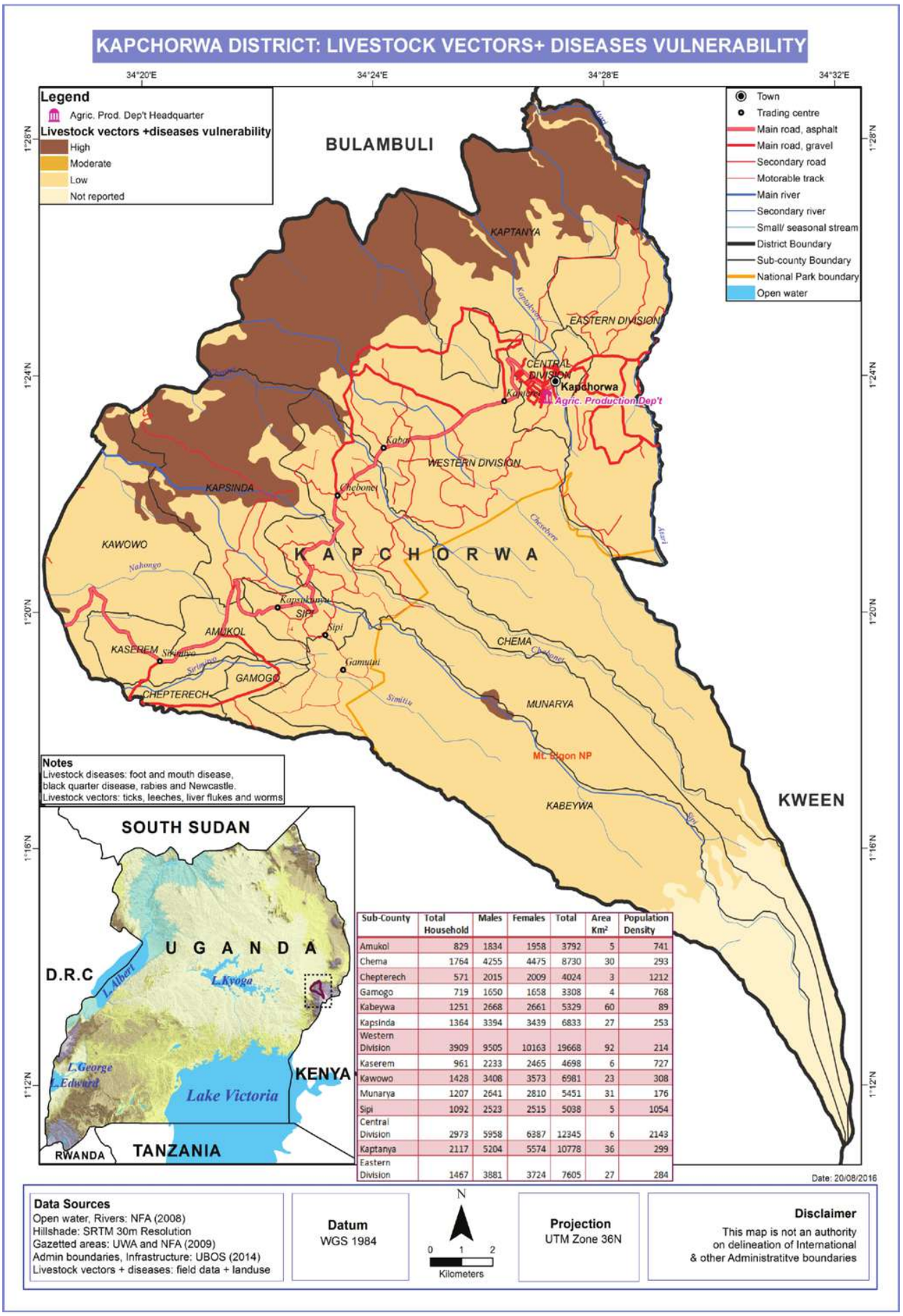
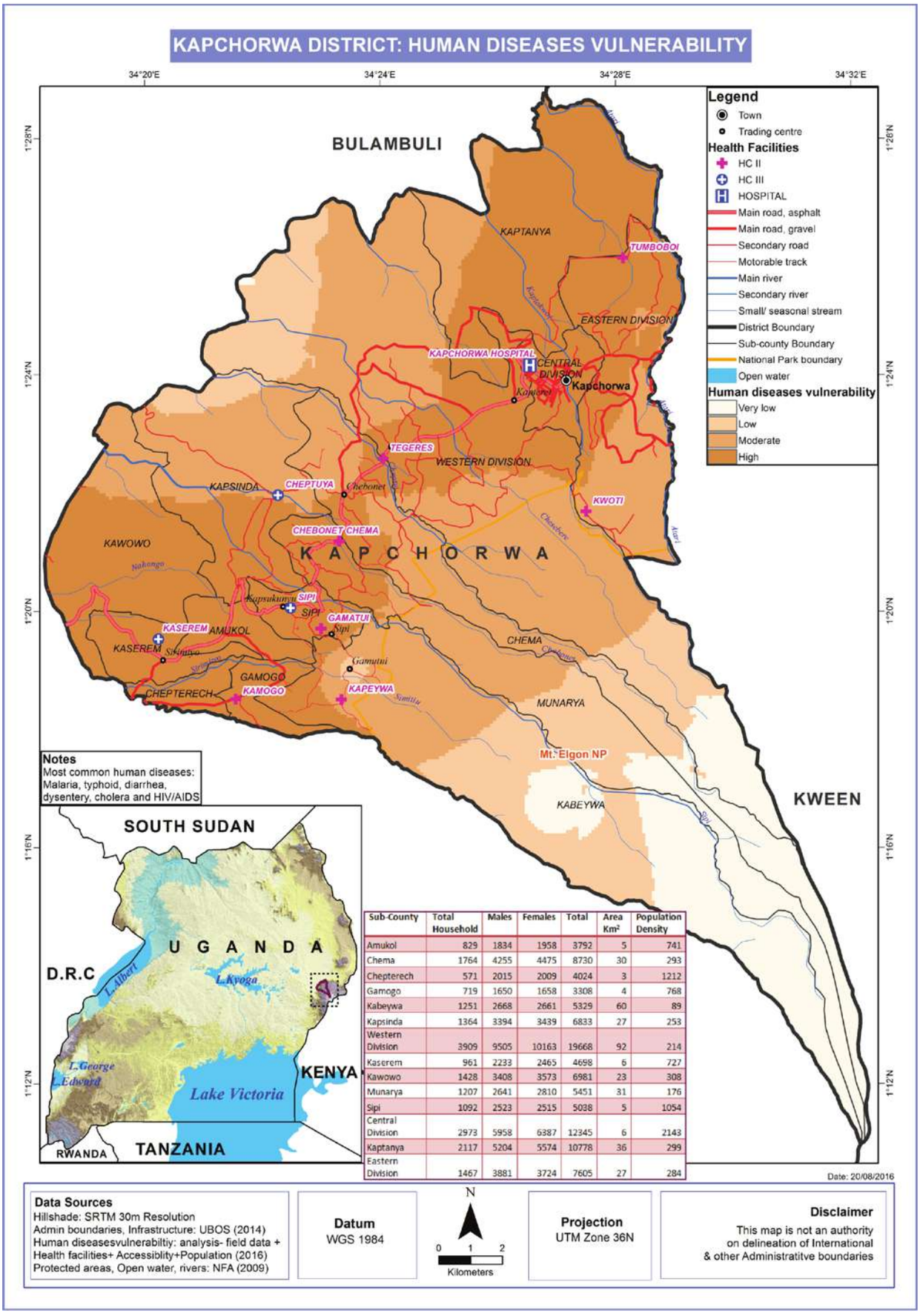



**Figure 13: Livestock Parasites, Vectors and Diseases Vulnerability, Kapchorwa District**

### *4.3.3. Human Diseases*

The most common human diseases in Kapchorwa district are; malaria, HIV/AIDS, cholera, typhoid, Pneumonia, Diarrhea, urinary tract infections and intestinal worms. Participants reported that malaria is the leading cause of mortality in the district. It was also noted that in 2014, the HIV/AIDS prevalence rate among females in Central division, was at 18%. District HIV Prevalence is 6.3 4% as per PLACE survey of 2014. The incidence Rate of 5.2% as per the PLACE survey of 2014.

It was also reported that during the heavy rains of April 2016, there was an outbreak of cholera in the district in Kawowo and Kapsinda sub-counties claimed to have originated from Bulambuli.

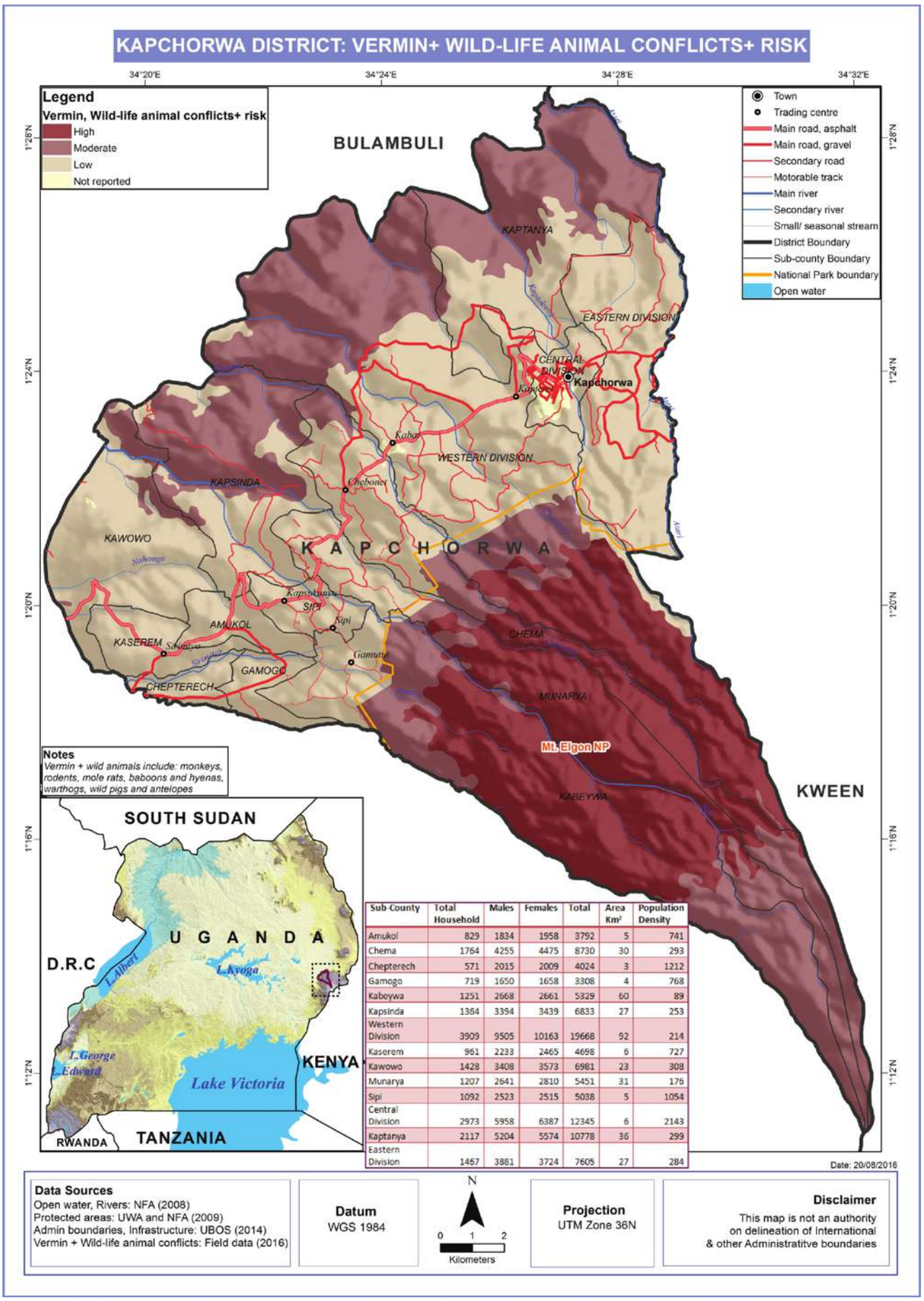



| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 14: Human Disease Prevalence and Health Facilities, Kapchorwa District**

### *4.3.4 Vermin and Wild-life Animal Attacks*

Results from participatory assessments indicated that wild dogs were a problem in the entire Kapchorwa district. Participants reported that wild dogs are a serious health hazard because they can easily spread rabies to the human population. The common areas are Kwoti in Kapchesome and Tegors in the parishes bordering the mount elgon National park where wild dogs exist.

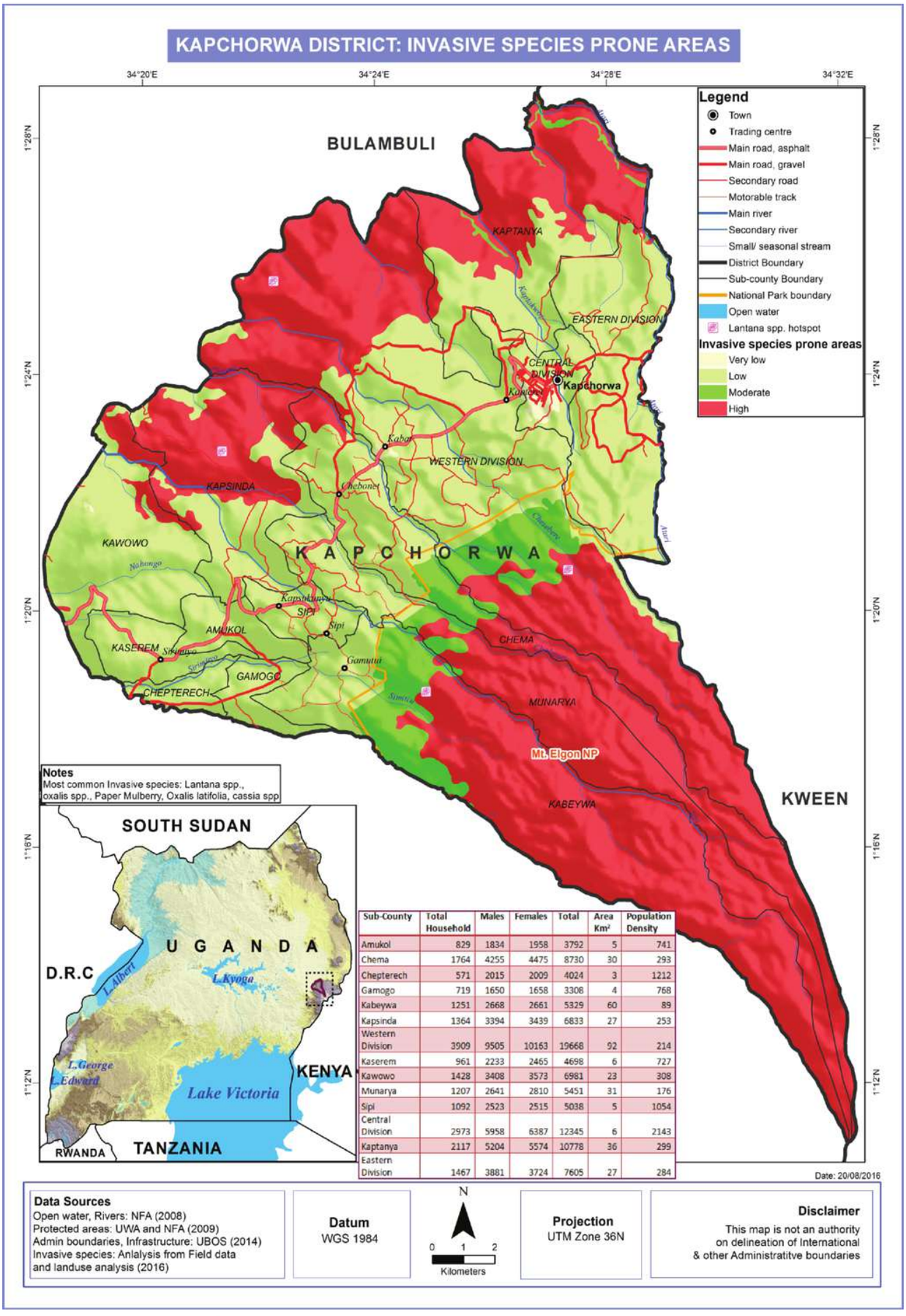



| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 15: Vermin and Wildlife Animal Conflicts and Vulnerability, Kapchorwa District**

*4.3.5 Invasive species*

The most reported invasive species in Kapchorwa district are; *Lantana camara Oxalis latifolia, cassia spp and paper mulberry I*nclude areas with lantana. *Lantana camara* and *Cassia spp* is common in Kaptanya sub-county, lower Kapteret, Kapsinda and Kawowo sub-counties. These areas have grazing free range areas. Paper mulberry is in Kapchesombe and Black wattle in upper Tegeres but not yet a serious issue. Being near the national park it is a potential problem, *Oxalis latifolia* is spread across the district especially were there is banana plantations- especially western division Sipi, upper Chema Munarya Amukol, gamago, Cheptarich and Kaserem.



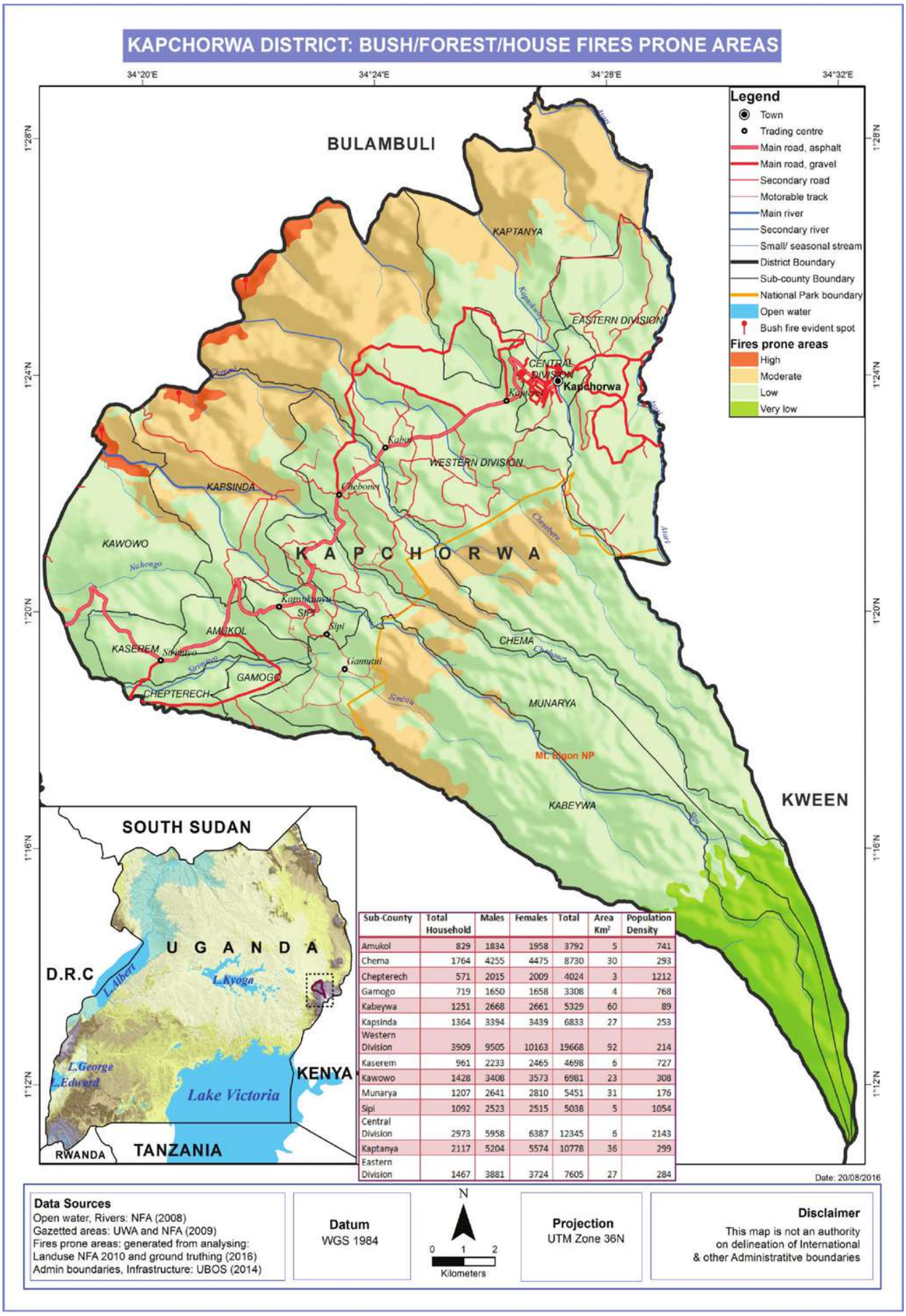

| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 16: Invasive Species Vulnerability, Kapchorwa District**

## 4.4 Human Induced and Technological Hazards

### *4.4.1 Fires*

Participants in the focus group discussions indicated that were not a serious problem in Kapchorwa district. However, cases of accidental such as the market fires were reported in Kapchorwa Town council in 2014. In 2013 in central Division around the Taxi Park, fire burnt restaurant.




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 17: Fires Hotspot Areas and Vulnerability, Kapchorwa District**

*4.4.2 Land conflicts*

Results from the participatory assessments indicated that land conflicts were common in Kapchorwa district. Participants reported that 80% of cases in court are land wrangles. Reports indicated that there were district boundary conflicts between Bulambuli and Kapchorwa districts. Another administrative boundary conflicts is between Kawowo and Kapsinda sub-counties. UWA – MENP with communities in Kwoti in Kapchesombe over the boundary. Other land conflicts were reported in Kaptanya sub-county.

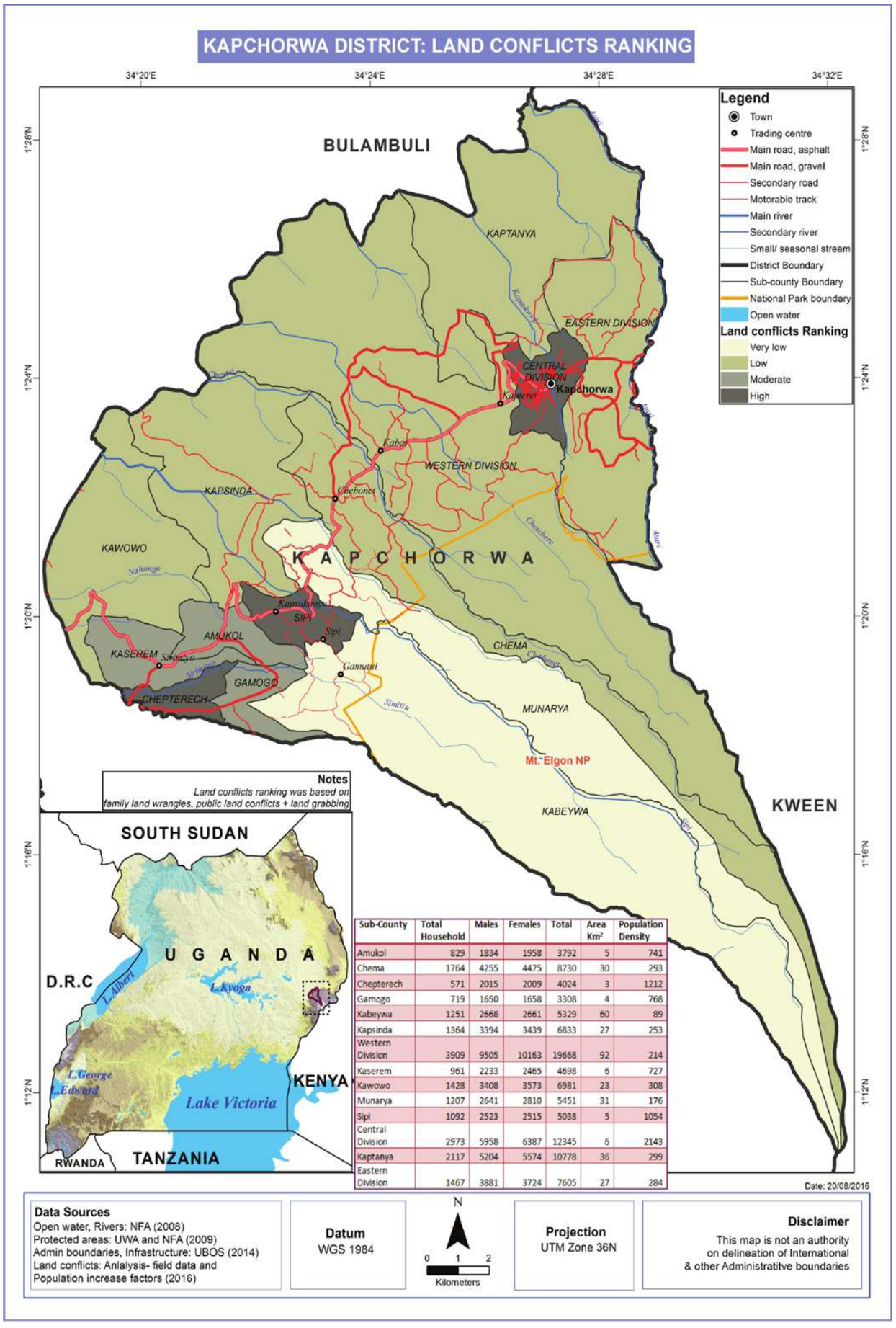
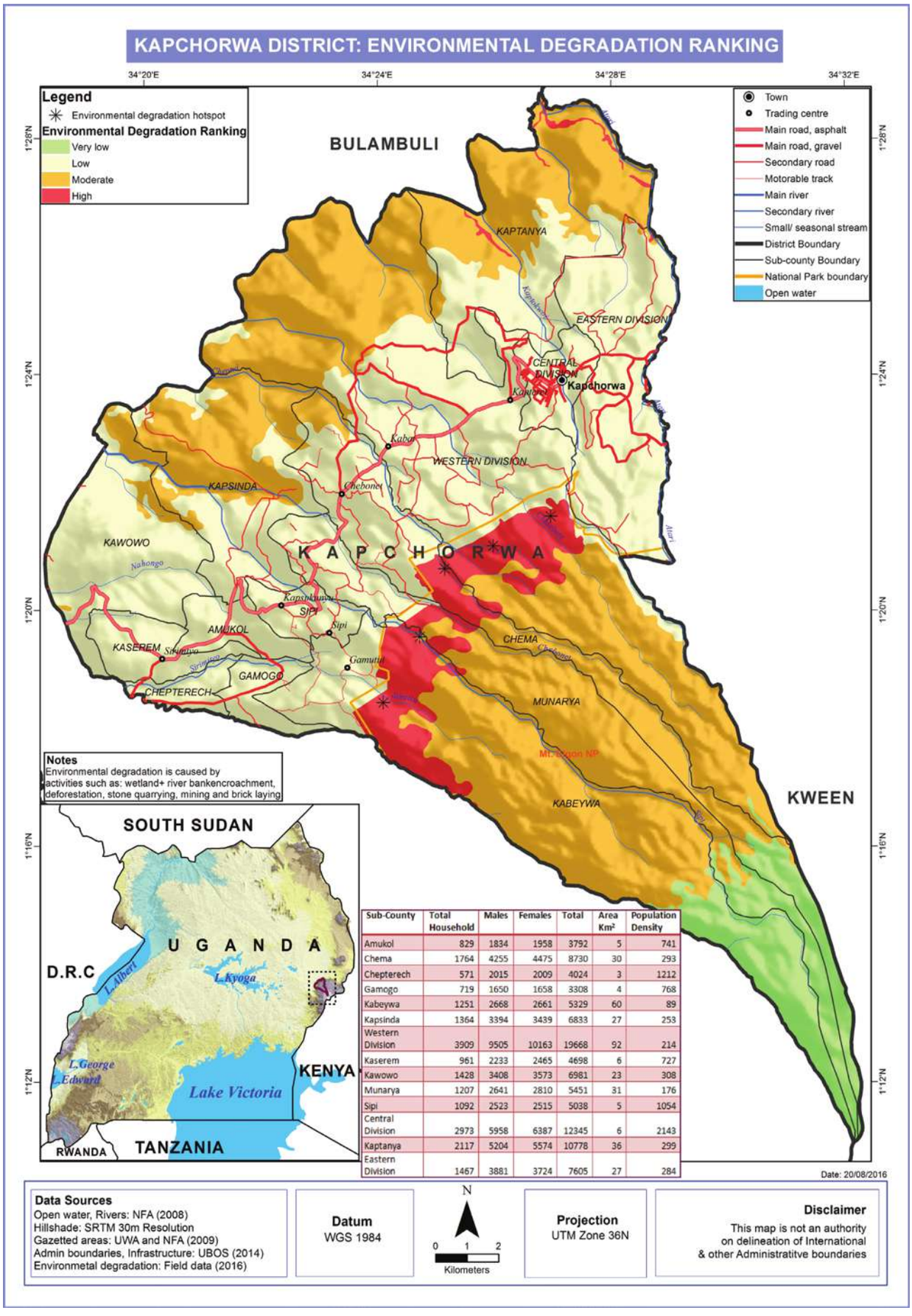



**Figure 18: Land Conflicts Ranking, Kapchorwa District**

*4.4.3 Environmental Degradation*

Participatory assessments indicated that the most common forms of environmental degradation in Kapchorwa district are; deforestation, conversion of wetlands into agricultural land, river bank encroachment, marram excavation and stone quarrying. All rivers and stream banks are encroached for mainly crop cultivation. Deforestation is very common in Kaptanya and Kwoti in Kapchesombe sub-county in eastern division of Kapchorwa municipality, Kaptany and Kapteret for marran.




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

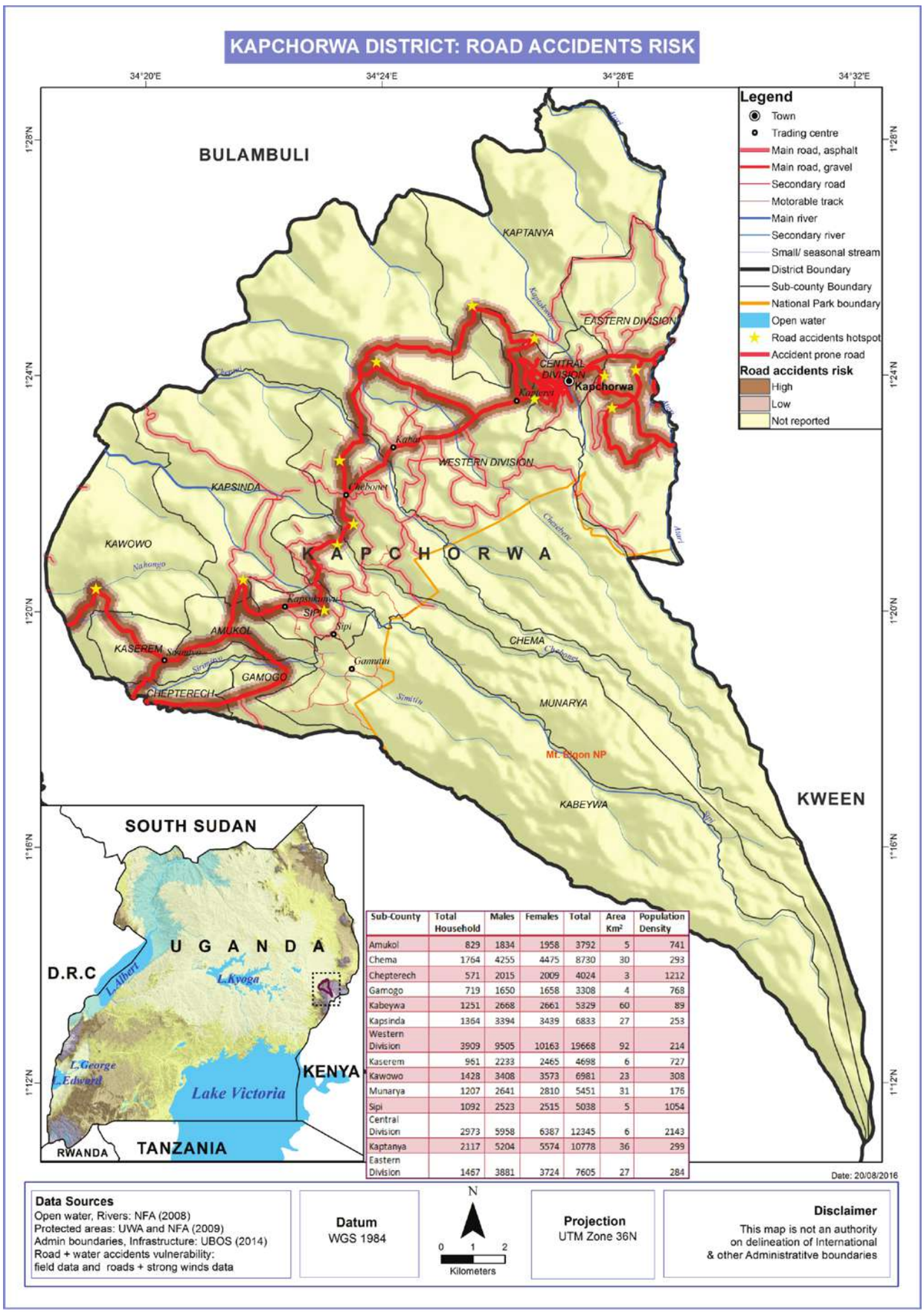
**Figure 19: Environmental Degradation Ranking, Kapchorwa District**

*4.4.4 Accidents (Road, Water, Electricty and Cliff fall offs)*

It was observed that road accidents occasionally occur along the Kapchorwa – Mbale highway (Figure 20). Participants reported that in 2014, a fatal accident occurred on this highway and killed about 200 UPDF soldiers. However, boda boda accidents were the most registered in the district.

Electricity accidents are risky in Kapchesombe and Sipi.

Incidences of cliff fall offs, some are intention: suicidal others are accidental including animals. In march 2016 a girl accidentally rolled over the cliff while walking home in Moron parish, Kaptanya subcounty. There is high potential for such accidents because most of the district is hilly.




| Sub-County | Total Household | Males | Females | Total | Area Km² | Population Density |
|---|---|---|---|---|---|---|
| Amukol | 829 | 1834 | 1958 | 3792 | 5 | 741 |
| Chema | 1764 | 4255 | 4475 | 8730 | 30 | 293 |
| Chepterech | 571 | 2015 | 2009 | 4024 | 3 | 1212 |
| Gamogo | 719 | 1650 | 1658 | 3308 | 4 | 768 |
| Kabeywa | 1251 | 2668 | 2661 | 5329 | 60 | 89 |
| Kapsinda | 1364 | 3394 | 3439 | 6833 | 27 | 253 |
| Western Division | 3909 | 9505 | 10163 | 19668 | 92 | 214 |
| Kaserem | 961 | 2233 | 2465 | 4698 | 6 | 727 |
| Kawowo | 1428 | 3408 | 3573 | 6981 | 23 | 308 |
| Munarya | 1207 | 2641 | 2810 | 5451 | 31 | 176 |
| Sipi | 1092 | 2523 | 2515 | 5038 | 5 | 1054 |
| Central Division | 2973 | 5958 | 6387 | 12345 | 6 | 2143 |
| Kaptanya | 2117 | 5204 | 5574 | 10778 | 36 | 299 |
| Eastern Division | 1467 | 3881 | 3724 | 7605 | 27 | 284 |

**Figure 20: Accident Hotspots and Vulnerability, Kapchorwa District**

## 4.5 VULNERABILITY PROFILE

Vulnerability depends on low capacity to anticipate, cope with and/or recover from a disaster and is unequally distributed in a society. The vulnerability profile of Kapchorwa district was assessed based on exposure, susceptibility and adaptive capacity at community (village), parish, sub-county and district levels highlighting their sensitivity to a certain risk or phenomena. Indeed, vulnerability was divided into biophysical (or natural including environmental and physical components) and social (including social and economic components) vulnerability. Whereas the biophysical vulnerability is dependent upon the characteristics of the natural system itself, the socio-economic vulnerability is affected by economic resources, power relationships, institutions or cultural aspects of a social system. Differences in socio-economic vulnerability can often be linked to differences in socio-economic status, where a low status generally means that you are more vulnerable.

Vulnerability was assessed basing on two broad criteria i.e. socio-economic and environmental components of vulnerability. Participatory approach was employed to assess these vulnerability components by characterizing the exposure agents, including hazards, elements at risk and their spatial dimension. Participants also characterized the susceptibility of the district including identification of the potential impacts, the spatial disposition and the coping mechanisms. Participants also identified the resilience dimension at different spatial scales (Table 4).

Table 5 (Vulnerability Profile) shows the relation between hazard intensity (probability) and degree of damage (magnitude of impacts) depicted in the form of hazard intensity classes, and for each class the corresponding degree of damage (severity of impact) is given. It reveals that climatological and meteorological hazards in form of drought and hailstorms predispose the community to high vulnerability state. The occurrence of pests and diseases and lightning, also create a moderate vulnerability profile in the community (Table 5). Table 6 shows Hazard assessment for Kapchorwa District.

## Table 4: Components of Vulnerability in Kapchorwa District

| Vulnerability | Exposure | | | Susceptibility | | | Resilience |
|---|---|---|---|---|---|---|---|
| | **Hazards** | **Elements at Risk** | **Geographical Scale** | **Susceptibility** | **Geographical Scale** | **Coping strategies** | **Geographical Scale** |
| **Socio-economic component** | Landslides, Rock falls and Soil erosion | - Human and livestock adjacent to hill slopes<br>- Crops on hill slopes<br>- Infrastructure e.g. houses, schools, roads adjacent to hill slopes | Parish | - Loss of lives<br>- Complete crop failure<br>- Destruction ofinfrastructure e.g. homes, and schools | Parish | -Migration<br>-Sensitization by both government and non-governmental agencies | Parish |
| | Earth quakes | - Infrastructure e.g. houses, schools | District | - Loss of lives<br>- Destruction of Infrastructure e.g. houses, schools | District | -No much measure so far | District |
| | Floods | - Livestock adjacent to flood plain<br>- Crops on flood plain<br>- Infrastructure<br>e.g. houses, schools, roads adjacent to flood plain | Parish | - Livestock loss<br>- Destruction of crops<br>- Destruction of infrastructure<br>e.g. houses, schools, roads adjacent to flood plain | Parish | -Migration<br>-Sensitization on wetland conservation<br>-Dig trenches | Parish |
| | Prolonged dry spells | - Livestock<br>- Crops<br>- Human population | Village | - Hunger & poverty<br>- Livestock loss<br>- Crop failure<br>- Shortage of pasture<br>- Shortage of water | Village | -Migration<br>-Sensitization on tree planting<br>-Buy food from elsewhere | Village |
| | Hailstorms, strong winds and Lightning | - Human and livestockpopulations<br>- Crops<br>- Infrastructure e.g. houses, schools, health centres | Parish | - Loss of lives<br>- Destruction of crops<br>- Destruction of infrastructure<br>e.g. houses, schools, roads adjacent to flood plain | Parish | | Parish |
| | Crop Pests and Diseases | -Crops | District | - Complete crop failure | District | - Spraying<br>- Cut and burry affected crops<br>-Sensitization on crop disease management | District |
| | Livestock Pests and Diseases | -Livestock (cattle, goats etc.) | District | - Loss of livestock<br>- Reduced livestock productivity | District | - Vaccination<br>- Burry and burn animals that have died from infection<br>- Quarantine | District |
| | Human Disease outbreaks | - Human Population | District | - Loss of lives | District | - Mass Immunization<br>- Use of mosquito nets | District |
| | Invasive species | -indigenous species<br>-Animals | District | - Outcompete the indigenous spp., suppress growth of indigenous species<br>- Loss of indigenous species.<br>- Complete crop Failure<br>- suppress growth of pasture | District | - Cut and burn<br>-Sensitization on Invasive species management | District |
| | Bush fires | - Livestock<br>- Crops<br>- Infrastructure e.g. houses, schools | Sub-county | - Loss of livestock<br>- Shortage of pasture<br>- Destruction of crops<br>- Destruction of infrastructure e.g. houses, schools | Sub-county | -Sensitization | Sub-county |
| | Road accidents | - Human population<br>- Infrastructure adjacent to accident black spots e.g. houses, schools etc. | Sub-county | - Loss of lives<br>- Destruction of vehicles<br>- Destruction of Infrastructure adjacent to accident black spots e.g. houses, schools etc. | Sub-county | -Humps on roads<br>-Signage on speed limits<br>-Sensitization on traffic rules | Sub-county |
| | Land conflicts | - Human population | Village | -Loss of lives<br>-Family violence and break outs | Village | - Community dialogue<br>- District court in charge of land issues | Village |
| | Vermin and Wildlife animal attacks | - Human population<br>- Livestock<br>- Crops | Parish | -Loss of lives<br>-Livestock loss<br>-Crop destruction | Parish | - Report to UWA<br>- Guard gardens<br>-Poison<br>-Hunt and kill<br>-Fence water collection points with Wildlife animals | Village |
| | Environmental degradation | - Human and livestock populations<br>- Crops<br>- Natural vegetation | Sub-county | -Crop failure<br>-Shortage of pasture<br>-Shortage of water<br>-Decline of water quality | Sub-county | -Sensitization on wetland conservation<br>-Sensitization on tree plating<br>-Setting bi-laws | Sub-county |

| Vulnerability | Exposure | | | Susceptibility | | | Resilience |
|---|---|---|---|---|---|---|---|
| **Environmental component** | Landslides, Rock falls and Soil erosion | - Human and livestock adjacent to hill slopes<br>- Crops on hill slopes<br>- Infrastructure<br>e.g. houses, schools, roads adjacent to hill slopes | Parish | - Loss of lives<br>- Complete crop failure<br>- Destruction of infrastructure e.g. homes, and schools | Parish | -Migration<br>-Sensitization by both government and non-governmental agencies | |
| | Earth quakes | - Infrastructure<br>e.g. houses, schools | District | - Loss of lives<br>- Destruction of Infrastructure<br>e.g. houses, schools | District | -No much measure so far | |
| | Floods | - Livestock adjacent to flood plain<br>- Crops on flood plain<br>- Infrastructure<br>e.g. houses, schools, roads adjacent to flood plain | Parish | - Livestock loss<br>- Destruction of crops<br>- Destruction of infrastructure<br>e.g. houses, schools, roads adjacent to flood plain | Parish | -Migration<br>-Sensitization on wetland conservation<br>-Dig trenches | |
| | Prolonged dry spells | - Livestock<br>- Crops<br>- Human population | Village | - Hunger & poverty<br>- Livestock loss<br>- Crop failure<br>- Shortage of pasture<br>- Shortage of water | Village | -Migration<br>-Sensitization on tree planting<br>-Buy food from elsewhere | |
| | Hailstorms, strong winds and Lightning | - Human and livestock populations<br>- Crops<br>- Infrastructure e.g. houses, schools, health centres | Parish | - Loss of lives<br>- Destruction of crops<br>- Destruction of infrastructure<br>e.g. houses, schools, roads adjacent to flood plain | Parish | | |
| | Crop Pests and Diseases | -Crops | District | - Complete crop Failure | District | - Spraying<br>- Cut and burry affected crops<br>-Sensitization on crop disease management | |
| | Livestock Pests and Diseases | -Livestock (cattle, goats etc.) | District | - Loss of livestock<br>- Reduced livestock productivity | District | - Vaccination<br>- Burry and burn animals that have died from infection<br>- Quarantine | |
| | Human Disease outbreaks | - Human Population | District | - Loss of lives | District | - Mass Immunization<br>- Use of mosquito nets | |
| | Invasive species | -indigenous species<br>-Animals | District | - Outcompete the indigenous spp., suppress growth of indigenous species<br>- Loss of indigenous species.<br>- Complete crop Failure<br>- suppress growth of pasture | District | - Cut and burn<br>-Sensitization on Invasive species management | |
| | Bush fires | - Livestock<br>- Crops<br>- Infrastructure<br>e.g. houses, schools | Sub-county | - Loss of livestock<br>- Shortage of pasture<br>- Destruction of crops<br>- Destruction of infrastructure e.g. houses, schools | Sub-county | -Sensitization | |
| | Road accidents | - Human population<br>- Infrastructure adjacent to accident black spots e.g. houses, schools etc. | Sub-county | - Loss of lives<br>- Destruction of vehicles<br>- Destruction of Infrastructure adjacent to accident black spots e.g. houses, schools etc. | Sub-county | -Humps on roads<br>-Signage on speed limits<br>-Sensitization on traffic rules | |
| | Land conflicts | - Human population | Village | -Loss of lives<br>-Family violence and break outs | Village | - Community dialogue<br>- District court in charge of land issues | |
| | Vermin and Wildlife animal attacks | - Human population<br>- Livestock<br>- Crops | Parish | -Loss of lives<br>-Livestock loss<br>-Crop destruction | Parish | - Report to UWA<br>- Guard gardens<br>-Poison<br>-Hunt and kill<br>-Fence water collection points with Wildlife animals | |
| | Environmental degradation | - Human and livestock populations<br>- Crops<br>- Natural vegetation | Sub-county | -Crop failure<br>-Shortage of pasture<br>-Shortage of water<br>-Decline of water quality | Sub-county | -Sensitization on wetland conservation<br>-Sensitization on tree plating<br>-Setting bi-laws | |

**Table 5: Vulnerability Profile for Kapchorwa District**

| | PROBABILITY | SEVERITY OF IMPACTS | RELATIVE RISK | VULNERABLE SUB COUNTIES |
|---|---|---|---|---|
| | *Relative likelihood this will occur* | *Overall Impact (Average)* | *Probability x Impact Severity* | |
| Hazards | *1 = Not occur<br>2 = Doubtful<br>3 = Possible<br>4 = Probable<br>5 = Inevitable* | *1 = No impact<br>2= Low<br>3=medium<br>4 = High* | *0-1= Not Occur<br>2-10= Low<br>11-15=Medium<br>16-20= High* | |
| Floods | 3 | 2 | 6 | Kawowo, Kapchesombe, Kaptanya, Kapsinda, |
| Prolonged dry spells | 3 | 3 | 6 | Kawowo, Kapsinda, Kaptanya Lower altitudes of Kapteret and Tegers, |
| Soil erosion, rock falls and landslides | 5 | 5 | 25 | All the sub-counties in the district |
| Hail storms, lightning and strong winds | 3 | 3 | 6 | Eastern division (Kapchesombe), Kaptanya, Central division, Western Division (Kapteret), Kawowo, Kapsinda |
| Fires | 3 | 2 | 6 | Kaptanya (Tumboboi), Central division, |
| Crop pests and diseases | 3 | 2 | 6 | All subcounties |
| Livestock pests and diseases | 3 | 3 | 9 | Kaptanya, Kawowo, Kapsinda, Lower areas of western division ( Kapteret and Tegeres), |
| Human Diseases outbreaks | 3 | 2 | 6 | Kapsinda, Kawowo |
| Land conflicts | 5 | 4 | 20 | In all subcounties |
| Vermin and Wild-life animal attacks | 3 | 2 | 6 | Kapchesombe, Tegeres |
| Earthquakes and faults | 2 | 2 | 4 | Kaptanya |
| Road accidents | 5 | 3 | | Kapcinda, Sipi, Amukol, Central division, Kawowo |
| Environmental degradation | 5 | 5 | 25 | Kapchesombe, Kawowo, Kapsinda, Kaptanya, western Didivision-Kapteret a& lower tegerses, |
| Invasive species | 2 | 2 | 4 | Entire district except for the paper mulberry and Black |

Note: This table presents relative risk for hazards to which the community was able to attach probability and severity scores.

Key for Relative Risk

| | |
|---|---|
| | High |
| | Medium |
| | Low |
| | Not reported/ Not prone |

**Table 6: Hazard Risk Assessment**

| Hazard | kaptanya | Eastern division | Central division | Western division | Chema | Munarya | Sipi | Kabaywa | Amukol | Kapsinda | Gamogo | Cheptarich | Kaserem | Kawowo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Floods | L | L | L | L | L | L | L | L | L | M | L | L | L | H |
| Prolonged dry spell | M | L | L | M | L | L | L | L | L | M | L | L | L | H |
| Landslides, Rock falls and Erosion | H | H | L | M | L | L | L | M | L | M | H | H | L | L |
| Strong winds, Hailstorms and Lightning | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| Crop pests and Diseases | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| Livestock pests and Diseases | M | L | L | M | L | L | L | L | L | H | L | L | L | H |
| Human disease outbreaks | | | L | | | | | | | L | | | | L |
| Vermin and Wild-life animal attacks | M | L | | L | | | L | L | | | | | | M |
| Land conflicts | H | H | M | L | L | L | L | L | L | M | L | L | L | M |
| Fires | L | | L | L | | | | | | L | | | | L |
| Environmental degradation | H | H | L | H | M | M | L | L | L | M | L | L | L | H |
| Earthquakes and faults | L | | | | | | | | | | L | | | |
| Road and Water accidents | | | M | | | | | | | H | H | | | M |
| Invasive species | L | L | L | M | L | L | L | L | L | M | M | L | L | M |

Key

| | |
|---|---|
| VH | Very high |
| H | High |
| M | Medium |
| L | Low |
| | Not reported/ Not prone |

*4.5.1 Gender and Age groups mostly affected by Hazards*

**Table 7: Gender and age groups mostly affected by hazards**

| Hazard | Gender and Age mostly affected |
|---|---|
| **Drought** | Affects mostly women and children since most water wells dry up increasing distance for fetching water |
| **Erosion** | All age groups and gender are affected |
| **Hailstorms**<br><br>**Lightning** | All gender and age groups<br><br>Children in schools are mostly affected |
| **Crop pests and Diseases** | All gender and age groups |
| **Livestock pests and Diseases** | All gender and age groups |
| **Human disease outbreaks** | All gender and age groups |
| **Vermin and Wildlife animal attacks** | All gender and age groups |
| **Land conflicts** | All gender and age groups |
| **Bush fires** | All gender and age groups |
| **Environmental degradation** | All gender and age groups |
| **Road accidents** | All gender and age groups |

*4.5.2 Coping Strategies*

In response to the various hazards, participants identified a range of coping strategies that the community employs to adjust to, and build resilience towards the challenges. The range of coping strategies are broad and interactive often tackling more than one hazard at a time and the focus of the communities leans towards adaptation actions and processes including social and economic frameworks within which livelihood and mitigation strategies take place; ensuring extremes are buffered irrespective of the direction of climate change and better positioning themselves to better face the adverse impacts and associated effects of climate induced and technological hazards (Table 2).

**Table 8: Coping strategies to the Multi-hazards in Kapchorwa District**

| No | Multi-Hazards | | Coping strategies |
|---|---|---|---|
| 1 | Geomorphological or Geological | Landslides, Rock falls and Erosion | • Migration to safe areas<br>• Terracing/ contour farming<br>• Plant trees to control water movement on hill slopes<br>• Mulching in banana plantations<br>• Plant grass in banana plantations on hill slopes<br>• Removal of stones from banana farmlands |
| 2 | | Earthquakes and faults | • Designs of houses (pillars)<br>• Early warning system<br>• Vigilance<br>• Sensitization<br>• Emergency response mechanisms |

| No | Multi-Hazards | | Coping strategies |
|---|---|---|---|
| 3 | Climatological or Meteorological | Floods | • Digging up of trenches in the flood plains<br>• Planting trees to control water movement to flood plains<br>• Migration to other areas<br>• Seek for government food aid |
| 4 | | Dry spells | • Leave wetlands as water catchments<br>• Plant trees as climate modifiers<br>• Buy food elsewhere in case of shortage<br>• Pay for cost of water distribution<br>• Food Storage especially dry grains<br>• Plant drought resistant crops<br>• Recommend water harvesting |
| 5 | | Strong winds, Hailstorms and Lightning | • Plant trees as wind breakers<br>• Use of stakes against wind in banana plantations<br>• Use of ropes to tire banana against wind<br>• Stay indoors during rains<br>• Changing building designs and roof types<br>• Removal of destroyed crops<br>• Request for aid from the Office of the Prime Minister<br>• Installation of lightning conductors on newly constructed schools |
| 6 | Ecological or Biological | Crop pests and Diseases | • Spraying pests<br>• Cutting and burying BBW affected crops<br>• Burning of affected crops<br>• Vigilance<br>• Clean plant materials<br>• Plant disease and pest resistant varieties |
| 7 | | Livestock Parasites and Diseases | • Spraying parasites<br>• Vaccinations<br>• Burying animals that have died from infection<br>• Quarantine |
| 8 | | Human epidemic Diseases | • Mass immunisation<br>• Visiting health centres<br>• Use of mosquito nets |
| 9 | | Vermin and Wild-life animal attacks | • Guarding the gardens<br>• Poisoning<br>• Hunt and kill<br>• Report to UWA<br>• Recommend vermin guards |
| 10 | | Invasive species | • Uproot<br>• Spray with herbicides (e.g 2-4-D for broad-leaved plants)<br>• Cut and burn<br>• Sensitization on Invasive species management |

| No | Multi-Hazards | | Coping strategies |
|---|---|---|---|
| 11 | Human induced or technological | Land conflicts | • Community dialogues<br>• Report to court<br>• Migration<br>• Resettlement<br>• Surveying and titling<br>• Strengthen Land management structures<br>• Sensitization on land ownership<br>• Proper demarcation (live fencing) |
| 12 | | Fires | • Stop the fires in case of fire outbreak<br>• Fire lines (may be constructed, cleared grass)<br>• Fire breaks planted along gardens e.g. euphorbia spp.<br>• Vigilance especially in dry seasons where most burning is done<br>• Bye-laws and ordinances and enforcement<br>• Sensitization on dangers of fires<br>• Recommend controlled burning |
| 13 | | Accidents (Road, Water, electricity) | • Construction of humps<br>• Road Signage including speed limits<br>• Separate lanes on sharp corners<br>• Sensitisation<br>• Widen narrow roads<br>• Plant trees on road reserve, as road guards<br>• Deployment of Traffic officers<br>• Sensitization on illegal electricity connections<br>• Reduce on electricity tarrifs to be affordable<br>• Engage local leaders to monitor illegal electricity connections<br>• Insulating the wire connection<br>• Encourage alternative sources of energy |
| 14 | | Environmental degradation | • Leave wetlands as water catchments<br>• Plant appropriate tree species as climate modifiers<br>• Get Approval of the physical planning committee before construction<br>• Sensitization<br>• Bye-laws<br>• Enforcement<br>• Gazatte and demarcate wetlands<br>• Restore wetlands and other fragile ecosystems<br>• EIA for new developments<br>• No land titles for wetland areas<br>• Cancellation of existing wetland land titles<br>• Developing land use plans and enforce them |

## GENERAL CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

The multi-hazard vulnerability profile output from this assessment was a combination of spatial modeling using socio-ecological spatial layers (i.e. DEM, Slope, Aspect, Flow Accumulation, Land use, vegetation cover, hydrology, soil types and soil moisture content, population, socio-economic, health facilities, accessibility, and meteorological data) and information captured from District Key Informant interviews and sub-county FGDs using a participatory approach. The level of vulnerability was assessed at sub-county participatory engagements and integrated with the spatial modeling in the GIS environment.

Results from the participatory assessment indicated that Kapchorwa district has over the past two decades increasingly experienced hazards including rock falls, soil erosion, floods, drought, hailstorms, strong winds, lightning, crop pests and diseases, livestock pests and diseases, human disease outbreaks, vermin, wildlife animal attacks, invasive species, bush fires and land conflicts putting livelihoods at increased risk. Generally landslides and flooding were identified as most serious problem in Kapchorwa district with almost all sub-counties being vulnerable to the hazards. The limited adaptive capacity (and or/resilience) and high sensitivity of households and communities in Kapchorwa district increase their vulnerability to hazard exposure necessitating urgent external support.

Hazards experienced in Kapchorwa district can be classified as:

i. Geomorphological or Geological hazards including landslides, rock falls, soil erosion and earth quakes.
ii. Climatological or Meteorological hazards including floods, drought, hailstorms, strong winds and lightning.
iii. Ecological or Biological hazards including crop pests and diseases, livestock pests and diseases, human disease outbreaks, vermin and wildlife animal attacks and invasive species.
iv. Human induced or Technological hazards including bush fires, road accidents land conflicts.

However, reducing vulnerability at community, local government and national levels should be a threefold effort hinged on:

i. Reducing the impact of the hazard where possible through mitigation, prediction, early warning and preparedness.
ii. Building capacities to withstand and cope with the hazards and risks.
iii. Tackling the root causes of the vulnerability such as poverty, poor governance, discrimination, inequality and inadequate access to resources and livelihood opportunities.

## 5.2 Policy-related Recommendations

The following recommended policy actions targeting vulnerability reduction include:

i. The government should improve enforcement of policies aimed at enhancing sustainable environmental health.
ii. The government through MAAIF should review the animal diseases control act because of low penalties given to defaulters.
iii. The government should establish systems to motivate support of political leaders toward government initiatives and programmes aimed at disaster risk reduction.
iv. The government should increase awareness campaigns aimed at sensitizing farmers/ communities on disaster risk reduction initiatives and practices.
v. The government should revive disaster committees at district level and ensure funding of disaster and environmental related activities.
vi. The government through UNRA and the District Authority should fund periodic maintenance of feeder roads to reduce on traffic accidents.
vii. Government should increase funding to the road sector to districts and decentralize most roads in the district to district for ease of maintenance.
viii. Government should speed up the process of acquiring the new road equipment to the district.
ix. The government through MAAIF and the District Production Office should promote drought and disease resistant crop seeds.
x. The government through relevant ministries should increase importation of lightning conductors and also reduce taxes on their importation.
xi. The government through OPM and Meteorology Authority should support establishment of disaster early warning systems.
xii. The government through MWE increase funding and staff to monitor wetland degradation and non-genuine agro-inputs.
xiii. The government through OPM should improve communication between the disaster department and local communities.
xiv. The government through MWE should promote Tree planting along road reserves.
xv. The government through MAAIF should fund and recruit extension works at sub-county level
xvi. To fund research on drought and disease resistant crops
xvii. Government should conduct elections for LCI and LCII's to handle cases of customary land conflicts as courts of first instance.
xviii. There should be special conditional grant handle acquisition of land titles for all government lands

## References

Jorn Birkmann (2006). Measuring Vulnerability to promote Disaster-Resilient Societies: Conceptual Frameworks and Definitions

MWE (2013). *Water and Environment Sector Performance Report*: Ministry of Water and Environment, Kampala

MWE (2012). *Uganda National Climate Change Policy*, Ministry of Water and Environment, Kamapla, Final version for approval, 18 July 2012, p.2

Kapchorwa District Local Government (2015). District Development Plan 2015/2016-2019/2020.

UBOS (2014). National Housing Population Census 2014; Uganda Bureau of Statics, Kampala

UNDP-UNDRO (1991). Mitigation Strategies in Disaster Mitigation UN Disaster Management Training Program

UNISDR (2009). UNISDR Terminology on Disaster Risk Reduction.

## APPENDIX I: DATA COLLECTION TOOLS

## FOCUS GROUP DISCUSSION GUIDE FOR DISTRICT DISASTER RISK MANAGEMENT FOCAL PERSONS

| | | | |
|---|---|---|---|
| Interviewer<br>Team Name(s) | District:<br>Sub- county:<br>Parish:<br>Village: | GPS Coordinates | |
| | | X: | |
| | | Y: | |
| | | Altitude | |

| No. | Name of Participants | Designation | Contact | Signature |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Introduction**

1850998784. You have all been requested to this session because we are interested in learning from you. We appreciate your rich experiences and hope to use them to strengthen service delivery across the district and the country as whole in a bid to improve access to information on Hazards and early warning.

1850998785. There is no “right” or “wrong” answers to any of the questions. As a Focus Group Discussion leader, I will try to ask all people here today to take turns speaking. If you have already spoken several times, I may call upon someone who has not said as much. I will also ask people to share their remarks with the group and not just with the person beside them, as we anxious to hear what you have to say.

1850998786. This session will be tape recorded so we can keep track of what is said, write it up later for our report. We are not attaching names to what you have to what is said, so whatever you say here will be anonymous and we will not quote you by name.

1850998787. I would not like to keep you here long; at most we should be here for 30 minutes- 1 hour.

**Section A: Geomorphological or Geological Hazards (Landslides, rock falls, soil erosion and earth quakes)**

2018836480. Which crops are majorly grown in your area of jurisdiction?

2018836481. Which domestic animals are dominant in your area of jurisdiction?

2018836482. What challenges are faced by farmers in your area of jurisdiction?

2018836483. Have you experienced landslides and rock falls in the past 10 years in your area of jurisdiction?

2018836484.

2018836485. Which villages, parishes or sub-counties have been most affected by landslide and rock falls?

2018836486. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836487. Which crops are majorly affected by landslides and rock falls in your area of jurisdiction?

2018836488. In which way are the crops affected by landslides and rock falls?

2018836489. Which domestic animals are majorly affected by landslides and rock falls in your area of jurisdiction?

2018836490. In which way are the domestic animals affected by landslides and rock falls?

2018836491. Which agricultural practices are being adopted by farmers in a bid to mitigate the above challenges?

2018836492. What are the relevant government's interventions focusing at helping farmers mitigate the challenges mentioned?

2018836493. Do you have any earth faults or earth cracks as lines of weakness in your area of jurisdiction?

2018836494. Have you experienced any earth quakes in the past 10 years in your area of jurisdiction?

2018836495. Which particular villages, parishes or sub-counties have been majorly affected by earth quakes in your area of jurisdiction?

2018836496. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836497. What impacts have been caused by earth quakes?

2018836498. To what extent have the earth quakes affected livelihoods of the local communities in your area of jurisdiction?

2018836499. Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

2018836500. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**Section B: Meteorological or climatological hazards (Floods, Droughts, Lightning, strong winds, hailstorms)**

2018836501. Have you experienced floods in the past 10 years in your area of jurisdiction?

2018836502. Which villages, parishes or sub-counties have been most affected by floods?

2018836503. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836504. Which crops are majorly affected by floods in your area of jurisdiction?

2018836505. In which way are the crops affected by floods?

2018836506. Which domestic animals are majorly affected by floods in your area of jurisdiction?

2018836507. In which way are the domestic animals affected by floods?

2018836508. Which agricultural practices are being adopted by farmers in a bid to mitigate the above challenges?

2018836509. What are the relevant government's interventions focusing at helping farmers mitigate the challenges mentioned?

2018836510. Have you experienced drought in the past 10 years in your area of jurisdiction?

2018836511. Which villages, parishes or sub-counties have been most affected by drought?

2018836512. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836513. Which crops are majorly affected by drought in your area of jurisdiction?

2018836514. In which way are crops affected by drought?

2018836515. Which domestic animals are majorly affected by drought in your area of jurisdiction?

2018836516. In which way are the domestic animals affected by drought?

2018836517. Which agricultural practices are being adopted by farmers in a bid to mitigate the above challenges?

2018836518. What are the relevant government's interventions focusing at helping farmers mitigate the challenges mentioned?

2018836519. Have you experienced hailstorms or lightning in the past 10 years in your area of jurisdiction?

2018836520. Which villages, parishes or sub-counties have been most affected by hailstorms or lightning?

2018836521. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836522. What impacts have been caused by hailstorms or lightning?

2018836523. To what extent have the hailstorms or lightning affected livelihoods of the local communities in your area of jurisdiction?

2018836524. Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

2018836525. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**Section C: Biological hazards (Crop pests and diseases, Livestock pests and Diseases, Invasive species, vermin and wild-life animal attacks)**

2018836526. Have you experienced any epidemic animal disease outbreaks in the past 10 years in your area of jurisdiction?

2018836527. Which villages, parishes or sub-counties have been most affected by epidemic animal disease outbreaks?

2018836528. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836529. Specify the epidemic animal disease outbreaks that have majorly affected animals in your area of jurisdiction?

2018836530. Which domestic animals are majorly affected by epidemic animal disease outbreaks in your area of jurisdiction?

2018836531. In which way are the domestic animals affected by epidemic animal disease outbreaks?

2018836532. Which mitigation practices are being adopted by farmers in a bid to mitigate the above epidemic animal disease outbreaks?

2018836533. What are the relevant government's interventions focusing at helping farmers mitigate the epidemic animal disease outbreaks mentioned?

2018836534. Have you experienced any crop pests and disease outbreaks in the past 10 years in your area of jurisdiction?

2018836535. Which villages, parishes or sub-counties have been most affected by epidemic animal disease outbreaks?

2018836536. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836537. Specify the crop pests and disease outbreaks that have majorly affected animals in your area of jurisdiction?

2018836538. Which crops are majorly affected by crop pests and disease outbreaks in your area of jurisdiction?

2018836539. In which way are the crops affected by crop pests and disease outbreaks?

2018836540. Which mitigation practices are being adopted by farmers in a bid to mitigate the above crop pests and disease outbreaks?

2018836541. What are the relevant government's interventions focusing at helping farmers mitigate the crop pests and disease outbreaks mentioned?

2018836542. Have you experienced any epidemic human disease outbreaks in the past 10 years in your area of jurisdiction?

2018836543. Specify the epidemic human disease outbreaks that have majorly affected animals in your area of jurisdiction?

2018836544. In which way are the humans affected by epidemic human disease outbreaks?

2018836545. Which mitigation measures have been adopted by local communities in a bid to mitigate the above epidemic human disease outbreaks?

2018836546. What are the relevant government's interventions focusing at helping local communities mitigate the epidemic human disease outbreaks mentioned?

2018836547. Do you have any national park or wildlife reserve in your area of jurisdiction?

2018836548. Have you experienced wildlife attacks in the past 10 years in your area of jurisdiction?

2018836549. Which particular villages, parishes or sub-counties have been majorly affected by wildlife attacks in your area of jurisdiction?

2018836550. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836551. What impacts have been caused by wildlife attacks?

2018836552. To what extent have the wildlife attacks affected livelihoods of the local communities in your area of jurisdiction?

2018836553. Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

2018836554. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

2018836555. Are there invasive species in your area of jurisdiction?

2018836556. Specify the invasive species in your area of jurisdiction?

2018836557. Which villages, parishes or sub-counties have been most affected by invasive species in your area of jurisdiction?

2018836558. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836559. Which crops or animals are majorly affected by invasive species in your area of jurisdiction?

2018836560. In which way are the crops or animals affected by invasive species?

2018836561. Which mitigation practices are being adopted by farmers in a bid to mitigate the above invasive species?

2018836562. What are the relevant government's interventions focusing at helping farmers mitigate the invasive species mentioned?

**Section D: Human induced or Technological hazards (Land conflicts, bush and forest fires, road accidents, water accidents and environmental degradation)**

2018836563. Have you experienced environmental degradation in your area of jurisdiction?

2018836564. What forms of environmental degradation have been experienced in your area of jurisdiction?

2018836565. Which villages, parishes or sub-counties have been most affected by environmental degradation?

2018836566. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836567. What impacts have been caused by environmental degradation?

2018836568. Which measures have been adopted by local communities in a bid to mitigate the above challenges?

2018836569. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

2018836570. Have you experienced land conflicts in the past 10 years in your area of jurisdiction?

2018836571. Which particular villages, parishes or sub-counties have been majorly affected by land conflicts in your area of jurisdiction?

2018836572. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836573. What impacts have been caused by land conflicts?

2018836574. To what extent have the land conflicts affected livelihoods of the local communities in your area of jurisdiction?

2018836575. Which conflict resolution measures have been adopted local communities in a bid to mitigate the above challenges?

2018836576. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

2018836577. Have you experienced Road accidents in the past 20 years in your area of jurisdiction?

2018836578. Which roads have experienced Road accidents?

2018836579. What impacts have been caused by Road accidents?

2018836580. To what extent have the Road accidents affected livelihoods of the local communities in your area of jurisdiction?

2018836581. Which conflict resolution measures have been adopted local communities in a bid to mitigate the above challenges?

2018836582. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

2018836583. Have you experienced any serious bush and or forest fires in the past 10 years in your area of jurisdiction?

2018836584. Which particular villages, parishes or sub-counties have been majorly affected by bush and or forest fires in your area of jurisdiction?

2018836585. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

2018836586. What impacts have been caused by serious bush and or forest fires?

2018836587. To what extent have the serious bush and or forest fires affected livelihoods of the local communities in your area of jurisdiction?

2018836588. Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

2018836589. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**FOCUS GROUP DISCUSSION GUIDE FOR LOCAL COMMUNITIES**

| | | | |
|---|---|---|---|
| Interviewer<br>Team Name(s) | District:<br>Sub- county:<br>Parish:<br>Village: | GPS Coordinates | |
| | | X: | |
| | | Y: | |
| | | Altitude | |

| No. | Name of Participants | Village/ Parish | Contact | Signature |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Introduction**

1850998788. You have all been requested to this session because we are interested in learning from you. We appreciate your rich experiences and hope to use them to strengthen service delivery across the district and the country as whole in a bid to improve access information on Hazards and early warning.

1850998789. There is no “right” or “wrong” answers to any of the questions. As a Focus Group Discussion leader, I will try to ask all people here today to take turns speaking. If you have already spoken several times, I may call upon someone who has not said as much. I will also ask people to share their remarks with the group and not just with the person beside them, as we anxious to hear what you have to say.

1850998790. This session will be tape recorded so we can keep track of what is said, write it up later for our report. We are not attaching names to what you have to what is said, so whatever you say here will be anonymous and we will not quote you by name.

1850998791. I would not like to keep you here long; at most we should be here for 30 minutes- 1 hour.

**Section A: Geomorphological or Geological Hazards (Landslides, rock falls, soil erosion and earth quakes)**

**1.** Which crops are majorly grown in your community?

**2.** Which domestic animals are dominant in your community?

**3.** What challenges are faced by farmers in your community?

**4.** Have you experienced landslides and rock falls in the past 10 years in your community?

**5.** Which villages and parishes have been most affected by landslide and rock falls?

**6.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

**7.** Which crops are majorly affected by landslides and rock falls in your community?

**8.** In which way are the crops affected by landslides and rock falls?

**9.** Which domestic animals are majorly affected by landslides and rock falls in your community?

**10.** In which way are the domestic animals affected by landslides and rock falls?

**11.** Which agricultural practices are being adopted by farmers in a bid to mitigate the above challenges?

**12.** What are the relevant government’s interventions focusing at helping farmers mitigate the challenges mentioned?

13. Do you have any earth faults or earth cracks as lines of weakness in your community?

14. Have you experienced any earth quakes in the past 10 years in your community?

15. Which particular villages, parishes or sub-counties have been majorly affected by earth quakes in your community?

16. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes that have been most affected?

17. What impacts have been caused by earth quakes?

18. To what extent have the earth quakes affected livelihoods of the local communities in your community?

19. Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

20. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**Section B: Meteorological or climatological hazards (Floods, Droughts, Lightning, strong winds, hailstorms)**

21. Have you experienced floods in the past 10 years in your community?

22. Which villages and parishes have been most affected by floods?

23. As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

24. Which crops are majorly affected by floods in your community?

25. In which way are the crops affected by floods?

26. Which domestic animals are majorly affected by floods in your community?

27. In which way are the domestic animals affected by floods?

28. Which agricultural practices are being adopted by farmers in a bid to mitigate the above challenges?

29. What are the relevant government's interventions focusing at helping farmers mitigate the challenges mentioned?

30. Have you experienced drought in the past 10 years in your community?

31. Which villages and parishes have been most affected by drought?

32. As a way of ranking from Low, Medium, High and Very high, rank the villages and

parishes that have been most affected?

**33.** Which crops are majorly affected by drought in your community?

**34.** In which way are crops affected by drought?

**35.** Which domestic animals are majorly affected by drought in your community?

**36.** In which way are the domestic animals affected by drought?

**37.** Which agricultural practices are being adopted by farmers in a bid to mitigate the above challenges?

**38.** What are the relevant government's interventions focusing at helping farmers mitigate the challenges mentioned?

**39.** Have you experienced hailstorms or lightning in the past 10 years in your community?

**40.** Which villages and parishes have been most affected by hailstorms or lightning?

**41.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

**42.** What impacts have been caused by hailstorms or lightning?

**43.** To what extent have the hailstorms or lightning affected livelihoods of the local communities in your community?

**44.** Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

**45.** What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**Section C: Biological hazards (Crop pests and diseases, Livestock pests and Diseases, Invasive species, vermin and wild-life animal attacks)**

**46.** Have you experienced any epidemic animal disease outbreaks in the past 10 years in your community?

**47.** Which villages and parishes have been most affected by epidemic animal disease outbreaks?

**48.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

**49.** Specify the epidemic animal disease outbreaks that have majorly affected animals in your community?

**50.** Which domestic animals are majorly affected by epidemic animal disease outbreaks in your community?

**51.** In which way are the domestic animals affected by epidemic animal disease outbreaks?

**52.** Which mitigation practices are being adopted by farmers in a bid to mitigate the above epidemic animal disease outbreaks?

**53.** What are the relevant government's interventions focusing at helping farmers mitigate the epidemic animal disease outbreaks mentioned?

**54.** Have you experienced any crop pests and disease outbreaks in the past 10 years in your community?

**55.** Which villages and parishes have been most affected by epidemic animal disease outbreaks?

**56.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

**57.** Specify the crop pests and disease outbreaks that have majorly affected animals in your community?

**58.** Which crops are majorly affected by crop pests and disease outbreaks in your community?

**59.** In which way are the crops affected by crop pests and disease outbreaks?

**60.** Which mitigation practices are being adopted by farmers in a bid to mitigate the above crop pests and disease outbreaks?

**61.** What are the relevant government's interventions focusing at helping farmers mitigate the crop pests and disease outbreaks mentioned?

**62.** Have you experienced any epidemic human disease outbreaks in the past 10 years in your community?

**63.** Specify the epidemic human disease outbreaks that have majorly affected animals in your community?

**64.** In which way are the humans affected by epidemic human disease outbreaks?

**65.** Which mitigation measures have been adopted by local communities in a bid to mitigate the above epidemic human disease outbreaks?

**66.** What are the relevant government's interventions focusing at helping local communities mitigate the epidemic human disease outbreaks mentioned?

**67.** Do you have any national park or wildlife reserve in your area of jurisdiction?

**68.** Have you experienced wildlife attacks in the past 10 years in your community?

**69.** Which particular villages and parishes have been majorly affected by wildlife attacks in your community?

**70.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

**71.** What impacts have been caused by wildlife attacks?

**72.** To what extent have the wildlife attacks affected livelihoods of the local communities in your community?

**73.** Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

**74.** What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**75.** Are there invasive species in your community?

**76.** Specify the invasive species in your community?

**77.** Which villages and parishes have been most affected by invasive species in your community?

**78.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

**79.** Which crops or animals are majorly affected by invasive species in your community?

**80.** In which way are the crops or animals affected by invasive species?

**81.** Which mitigation practices are being adopted by farmers in a bid to mitigate the above invasive species?

**82.** What are the relevant government's interventions focusing at helping farmers mitigate the invasive species mentioned?

**Section D: Human induced or Technological hazards (Land conflicts, bush and forest fires, road accidents, water accidents and environmental degradation)**

**83.** Have you experienced environmental degradation in your community?

**84.** What forms of environmental degradation have been experienced in your community?

**85.** Which villages and parishes have been most affected by environmental degradation?

**86.** As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

87. What impacts have been caused by environmental degradation?

88. Which measures have been adopted by local communities in a bid to mitigate the above challenges?

89. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

90. Have you experienced land conflicts in the past 10 years in your community?

91. Which particular villages and parishes have been majorly affected by land conflicts in your community?

92. As a way of ranking from Low, Medium, High and Very high, rank the villages and parishes that have been most affected?

93. What impacts have been caused by land conflicts?

94. To what extent have the land conflicts affected livelihoods of the local communities in your community?

95. Which conflict resolution measures have been adopted local communities in a bid to mitigate the above challenges?

96. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

97. Have you experienced Road accidents in the past 20 years in your community?

98. Which roads have experienced Road accidents?

99. What impacts have been caused by Road accidents?

100. To what extent have the Road accidents affected livelihoods of the local communities in your community?

101. Which conflict resolution measures have been adopted local communities in a bid to mitigate the above challenges?

102. What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

103. Have you experienced any serious bush and or forest fires in the past 10 years in your community?

104. As a way of ranking from Low, Medium, High and Very high, rank the villages, parishes or sub-counties that have been most affected?

105. What impacts have been caused by serious bush and or forest fires?

**106.** To what extent have the serious bush and or forest fires affected livelihoods of the local communities in your community?

**107.** Which mitigation measures have been adopted local communities in a bid to mitigate the above challenges?

**108.** What are the relevant government's interventions focusing at helping local communities mitigate the challenges mentioned?

**FOCUS GROUP ATTENDANCE LIST FOR DISTRICT DISASTER RISK MANAGEMENT FOCAL PERSONS**

**Name of Participant** **Designation** **Contact**

**FOCUS GROUP DISCUSSION ATTENDANCE LIST FOR LOCAL COMMUNITIES**

**Name of Participant** **Village/Parish** **Contact**

**Name of Participant** **Village/Parish** **Contact**

**SPATIAL DATA COLLECTION SHEET FOR HAZARD VULNERABILITY AND RISK MAPPING**

| | | | | |
|---|---|---|---|---|
| Observer Name: | District: | Coordinates | | |
| | Sub- county: | X: | | |
| | Parish: | Y: | | |
| Date: | Village: | Altitude | | |

| **Slope characterization** | | **Bio-physical characterization** | | **Vegetation characterization** | | **Land use type (tick)** |
|---|---|---|---|---|---|---|
| Slope degree (e.g 10, 20, …) | | Soil Texture | | Veg. cover (%) | | Bush<br>Grassland<br>Wetland<br>Tree plantation<br>Natural forest<br>Cropland<br>Built-up area<br>Grazing land<br>Others |
| Slope length (m) (e.g 5, 10, …) | | Soil Moisture | | Tree cover (%) | | |
| Aspect (e.g N, NE…) | | Rainfall | | Shrubs cover (%) | | |
| Elevation (e.g high, low…) | | Drainage | | Grass / Herbs cover (%) | | |
| Slope curvature (e.g concave, covex…) | | Temperature | | Bare land cover | | |
| **Area Description (Susceptibility ranking: landslide, mudslide, erosion, flooding, drought, hailstorms, lightning, cattle disease outbreaks, human disease outbreaks, land conflicts, wildlife conflicts, bush fires, earthquakes, faults/ cracks, pictures, any other sensitive features)** | | | | | | |
| | | | | | | |

Available online: http://www.necoc-opm.go.ug/


THE REPUBLIC OF UGANDA

Department of Relief, Disaster
Preparedness and Management
Office of the Prime Minister
P.O.Box 371, Kampala, Uganda

**With support from:**


*Empowered lives.*
*Resilient nations.*

United Nations Development Programme

Plot 11 Yusuf Lule, Road, Nakasero
P. O. Box 7184, Kampala, Uganda
Tel: (+256) 417 112 100
Fax: (+256) 414 344 801
www.undp.org