THE REPUBLIC OF UGANDA

# Nakaseke District

## Hazard, Risk and Vulnerability profile

2016

**Acknowledgment**

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 Kirungi Raymond - Disaster Preparedness Officer and the team of consultants (GIS/DRR specialists); Dr. Bernard Barasa, and Mr. Nsiimire Peter, who provided technical support.

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My appreciation also goes to Nakaseke District Team;

1. Mr. Ssbbaale Edrisa - District Production and Marketing Officer
2. Sekagya Moses - 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 Nakaseke, Semuto, Kasagombe, 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-day regional data verification and validation workshop was organized by UNDP in Kampala city 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 Nakaseke 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 Nakaseke 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 and human diseases were identified as most serious problems in Nakaseke District with almost all Sub-counties being vulnerable to the hazards. This is because the area is generally hilly hence very prone to soil erosion in case of heavy rains.

The limited adaptive capacity (and or/resilience) and high sensitivity of households and communities in the District increase 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 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.

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## 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 Programme |
| 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).

# 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 Nakaseke District in Central 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 Nakaseke District, Central Uganda.

### *1.2.2 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 following:

i. Collection of field data using GIS in close collaboration and coordination with OPM in Nakaseke 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 four sections: Section 1 provides Introduction on the assignment. Section 2 elaborates on the overview of Nakaseke District. Section 3 focuses on the methodology employed. Section 4 elaborates the Multi-hazard, Risks and Vulnerability profile and Coping strategies for Nakaseke District. Section 5 describes Conclusions and policy related recommendations.

## OVERVIEW OF NAKASEKE District

### 2.1 Location

Nakaseke District was carved out of Luweero District in July 2005. It is located between coordinates: 0° 44′ 0″ N and 32° 25′ 0″ E in the Central region of Uganda. The District is bordered by Nakasongola District to the North and Northeast, Luweero District to the Southeast, Wakiso District to the South, Mityana District to the Southwest. Kiboga District and Kyankwanzi District lie to the West and Masindi District lies to the Northwest. The District has 10 Sub-counties and 5 Town Councils. These include: Kapeeka, Kasangombe, Kikamulo, Kinoni, Kinyogoga, Kito, Nakaseke, Ngoma, Semuto and Wakyato Sub-counties. The Town Councils include; Butalangu, Kiwoko, Nakaseke, Ngoma and Semuto.

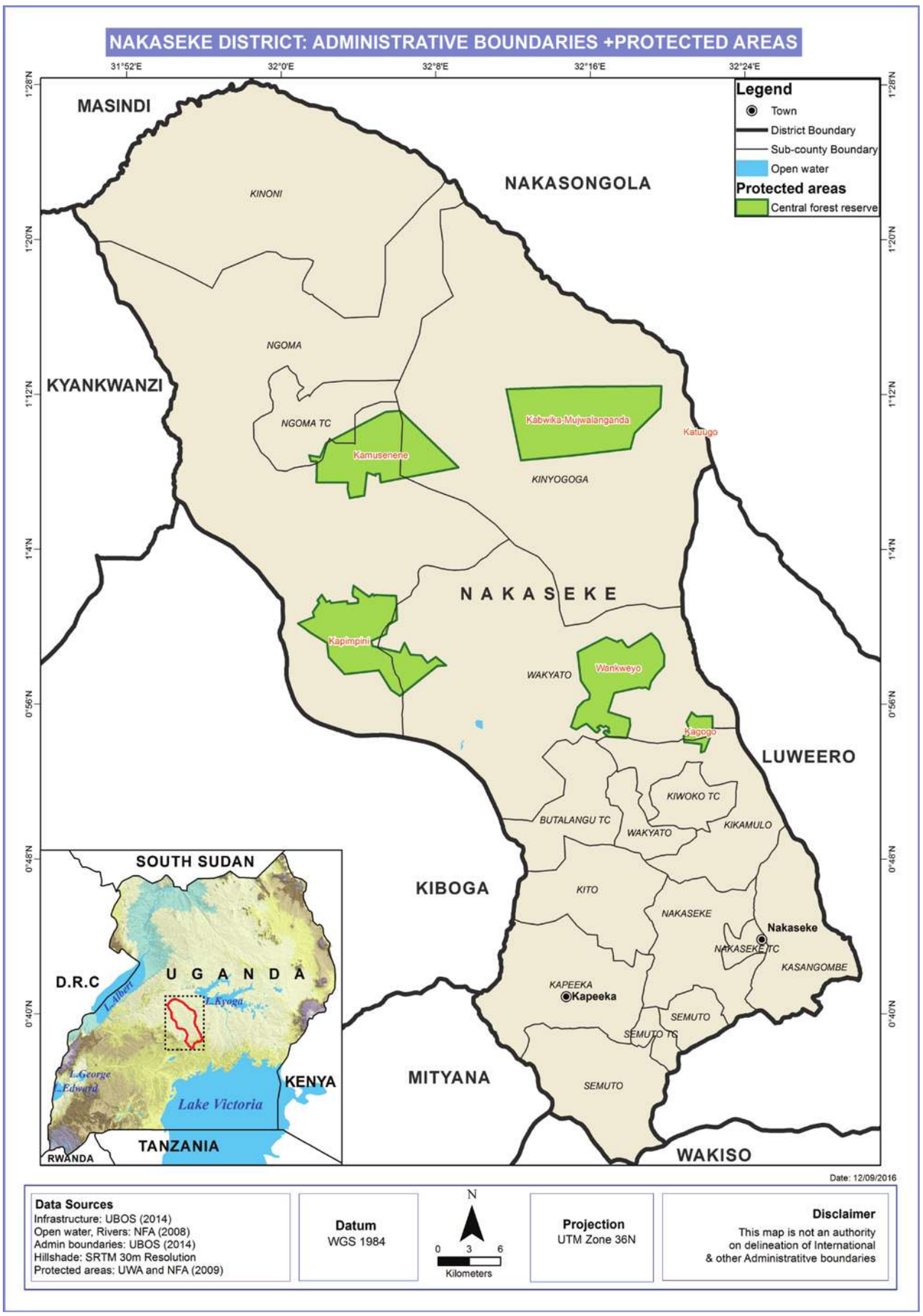



**Figure 1: Administrative Boundaries and Gazetted areas, Nakaseke District**

### 2.1.1 Geomorphology

The topography is as a result of a number of ancient denudation processes on the rock systems leaving a series of old erosion levels throughout the District (Roadwaski, 1960 and Omoding 1994). Hilly uplands dominate the south ancient granitic rocks, with interlocking valleys that break up the low hills in the southern part of the District. The Northern region is largely flat and low lying.

The relief of the largest part of Nakaseke District is generally low and flat characterized by shallow seasonal wetlands in North and flat-topped hills in South. Its altitude ranges fro1000-1250m above sea level (average of 1150m).

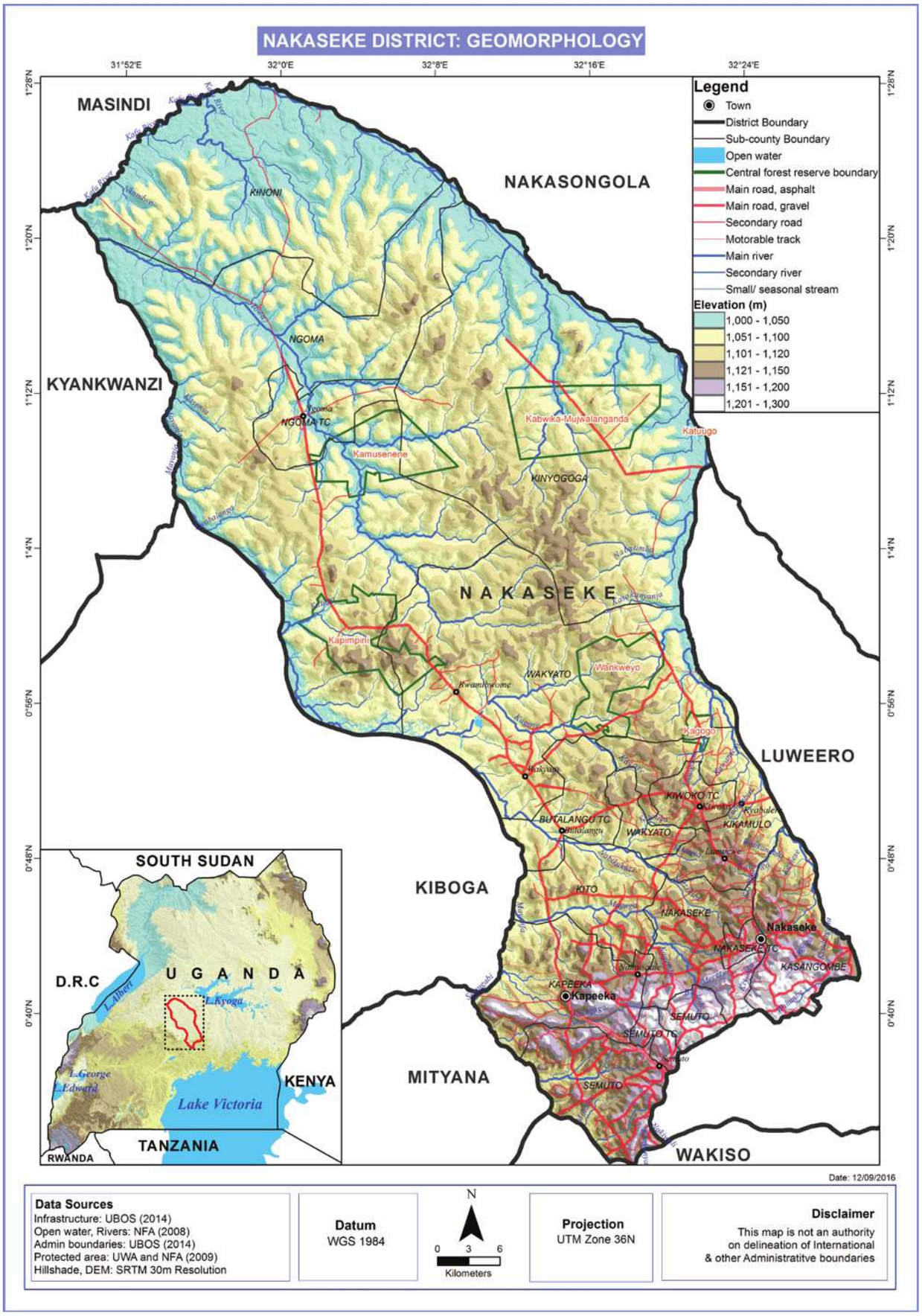



**Figure 2: Geomorphology, Nakaseke District**

### 2.1.2 Geology

The largest part of the District is covered by metamorphic rocks of pre-cambrian era. According to Roadwaski, 1960 and Omoding (1994) the detailed stratigraphy of Luwero Nakaseke inclusive is very complex and the composition of the rocks within the same bed is not uniform. Most of the geological formation consists of basement complex systems as the oldest, overlain in places by a succession of sedimentary strata which will have undergone a variable degree of metamorphosis. These major geological formations are characterized by presence of young intrusive rocks, mostly acidic and less commonly basic. The youngest formations of Pleistocene are represented by the sand, quartz and clay alluvial or lacustrine origin.

The soils in the District are generally red sandy loams in the north and clay loams in the south. The clay loams are relatively fertile hence support growth/ cultivation of a variety of crops. The sandy loam soils in the north have relatively low nutrient/ fertility content.

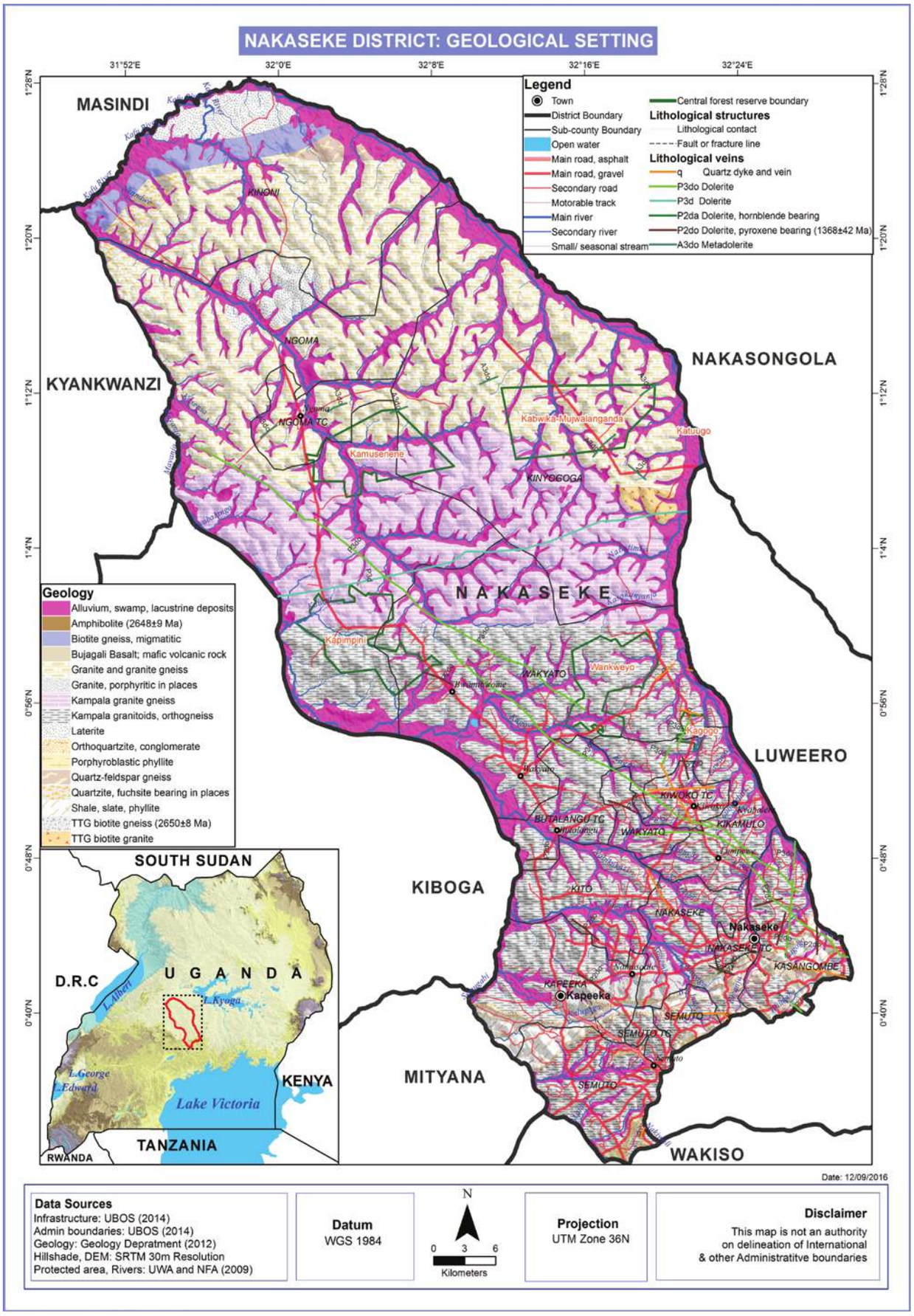



**Figure 3: Geology and Lithological Structures, Nakaseke District**

### 2.1.3 Vegetation and Land use Stratification

Nakaseke District is made up of two ecological zones namely; the northern pastoral zone (rangeland/cattle corridor) dominated by pastoralists and the southern crop based zone dominated by cultivators. The pastoral ecological zone covers more than three quarters of the District and is a cattle corridor. It has a less population of human beings and a high population of animals. The southern ecological zone is crop farming/ cultivation zone, which is less than a quarter of the total land area.

Vegetation cover in the District is largely the Savannah type. The vegetation can be classified in the following categories.

The southern part of the District is believed to have been covered by forests before farming/ agriculture begun. This forms areas like Sub-counties of Semuto, Nakaseke, Kasangombe and large parts of Kapeeka, Kito and Kikamulo Sub-counties with annual rainfall exceeding 1250mm. This vegetation is typically composed of trees, thickets, shrubs and grasslands.

In the northern part of the District, the vegetation is largely savanna woodland with the dominant vegetation type including *Combretum spp* and *Terminalia spp etc,* although it has greatly been affected/ modified by human activities like charcoal production and overgrazing. Such areas incude; Sub-counties of Ngoma, Kinoni, Kinyogoga, Wakyato and some parts of Kikamulo, Kito Kapeeka and Ngoma and Butalangu Town Coucils. This wooded savanna is however more open with continuous grass layer. Combretum and terminalia are soon getting extincted due to excessive charcoal production and over grazing.

**Wetland vegetation**

This is the dominant vegetation cover which is generally with less trees occurs extensively in all zones at the fringes of permanent swamps, and rivers. Some of the permanent include; Magaga, Danze, Kizzi, Kibi, Kayiwaggobe, Kiyanja, Kattabaana, Nvuye, the list is endless. Other areas where this vegetation is found include; rivers like Lugogo/ Lumansi, Mayanja and Towa. They are often undifferentiated as they inter connect but predominantly covered with *cyperus* papyrus and *miscanthus violalaceous*. All these rivers drain into Lake Kyoga through river Kafu.

Forest reserves in the District had also been dominated by the same vegetation cover and their details are indicated in Table 1:

**Table: 1 Forest Reserves in the District by location and Sub-county**

| | | | | | |
|---|---|---|---|---|---|
| 1- | Kagogo | Wakyato | Central Government | 689 | Grazing |
| 2- | Wankweyo | Wakyato | Central Government | 4944 | Grazing |
| 3- | Kapimpini | Wakyato & Ngoma | Central Government | 6242 | Grazing |
| 4- | Kamusenene | Ngoma | Central Government | 6177 | Grazing |
| 5- | Kabwika Mujwalanganda | Ngoma | Central Government | 8285 | Grazing |
| 6- | Nabika | Nakaseke | Local Government | 91 | Mild farming |
| | **TOTAL** | | | **26428** | |

*Source: District Forest report, December 2010*

Most of these forest reserves however now hardly have a single tree standing due to heavy encroachment through settlements, crop cultivation, and charcoal production and overgrazing.

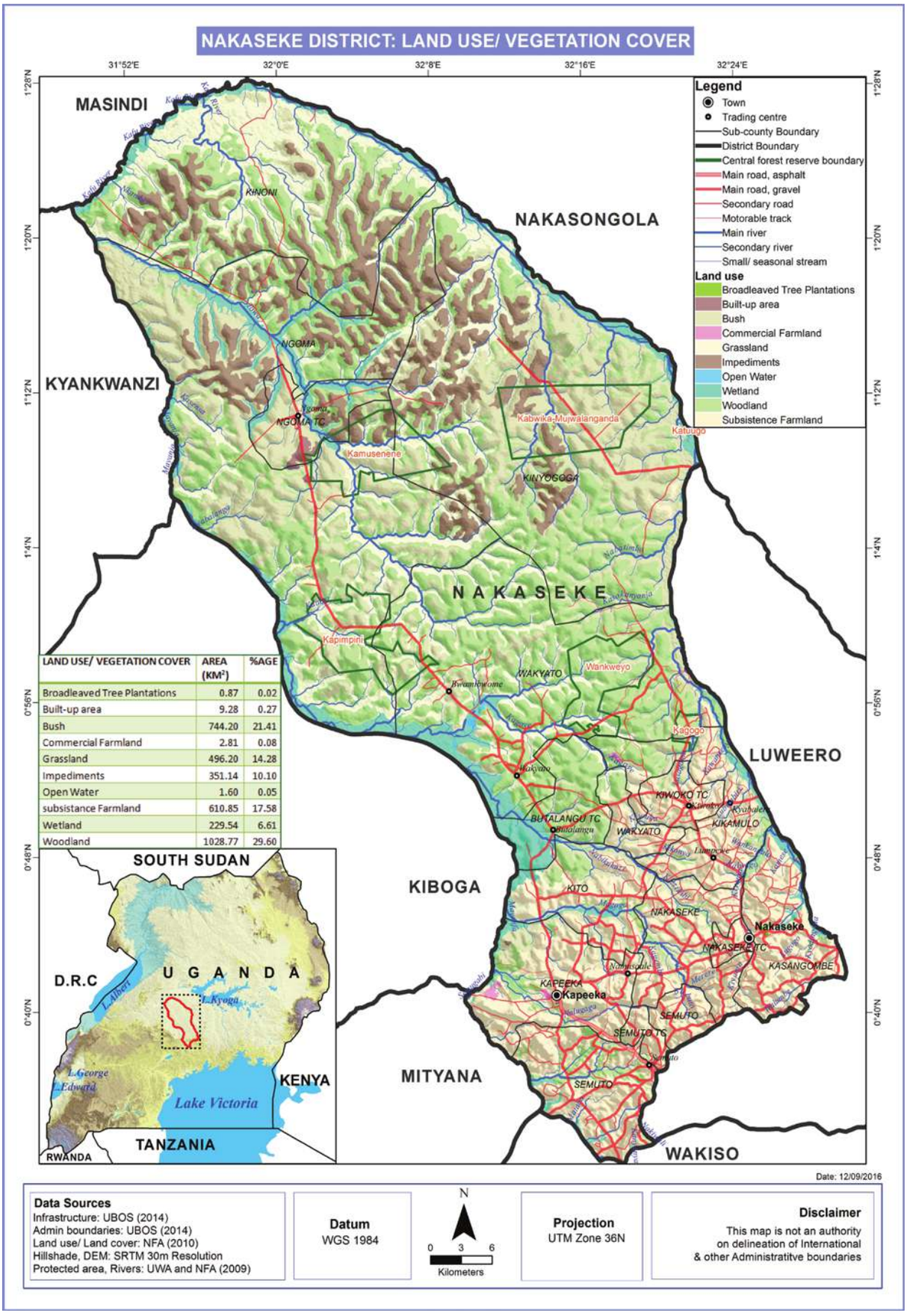



**Figure 4: Land use Stratification, Nakaseke District**

### *2.1.4 Temperature and Humidity*

The variations in temperatures are not significant. The District recorded a mean annual maximum temperature of between 27.50C-30$^{o}$C and a minimum of 15$^{o}$C and 17.5$^{0}$ C.

### *2.1.5 Rainfall*

The District's climate can be described as modified equatorial climate. Nakaseke District has two rainfall Seasons, with the main one from March to June and the second one from August to November. The average rainfall is 1300mm and the mean annual rainfall is between 1450mm to1500mm. However in some instances the rainfall pattern described may become irregular causing farmers' failure to plan accordingly.

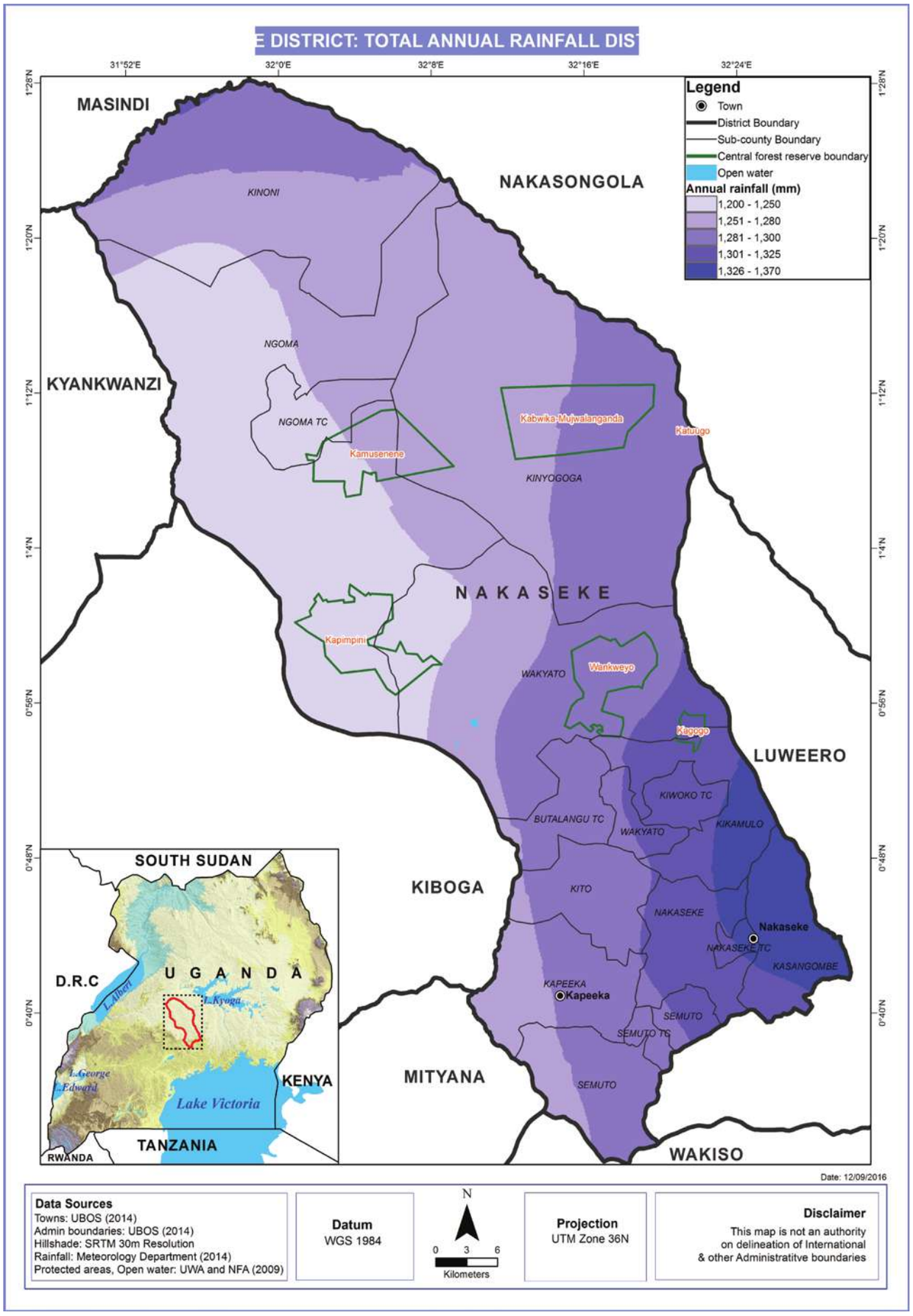



**Figure 5: Total Annual Rainfall Distribution, Nakaseke District**

### *2.1.6 Hydrology and drainage*

Wetlands and rivers cover 150sq.km of the District while it has no major open water body. There is one minor Lake by the name of Nabisojjo in the District. River Mayanja makes the boundary of the District with Wakiso, Mityana Kiboga and Kyankwanzi Districts on the Western side while River Kafu makes the boundary of Masindi District in the Northern side. The primary wetlands include; Mayanja, Lugogo/Lumansi and Towa. Lugogo makes the boundary of the District with Nakasongola and Luwero Districts in the Northeast and Eastern sides respectively, in addition to many secondary and tertiary wetlands.

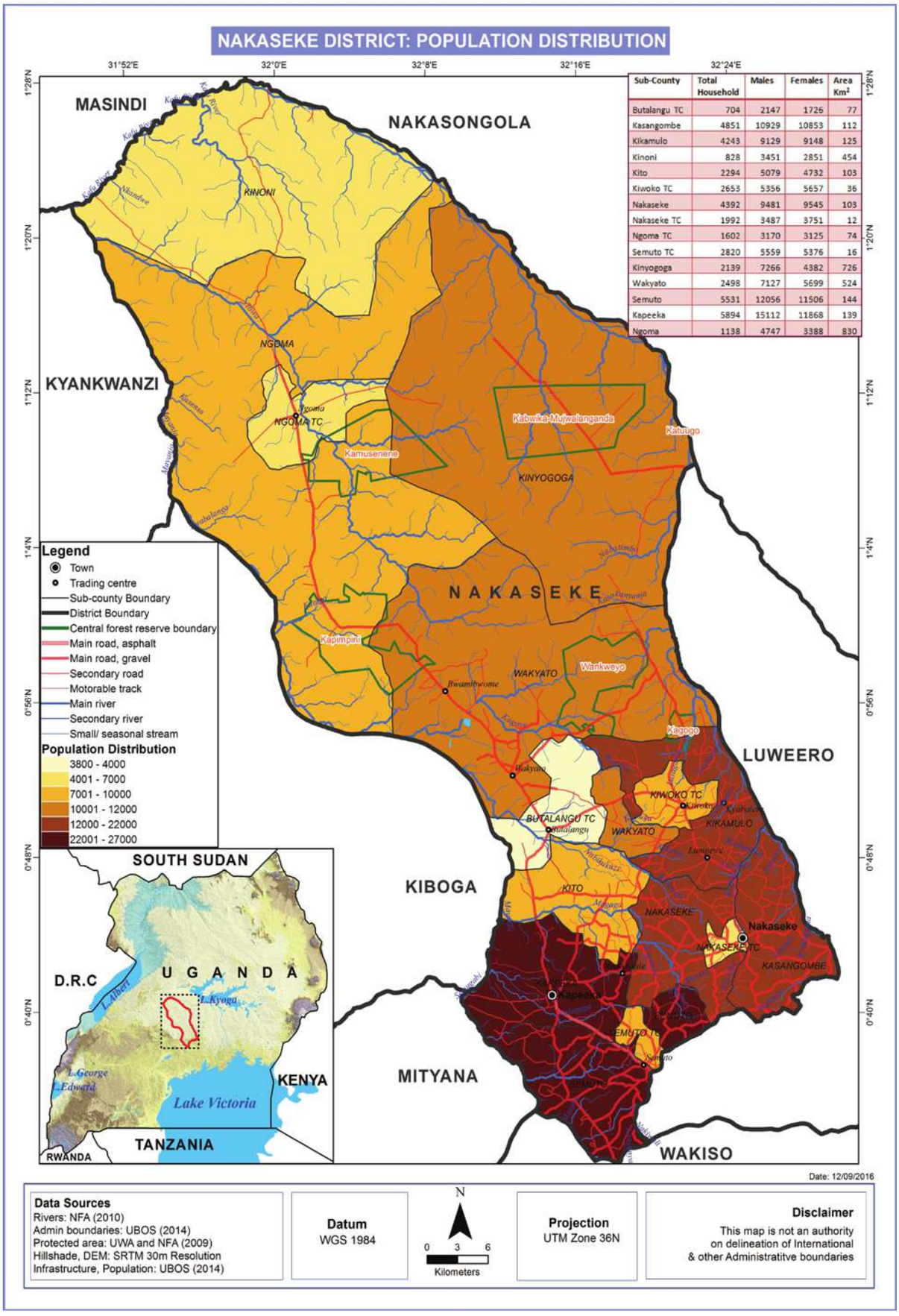
### *2.1.7 Population*

Nakaseke District is made up of several tribes majority being the Baganda. Others include the Basoga, Banyankole, Bakiga, Banyarwanda, Baruuli, etc and South Sudan nationals. According to the National Population and Housing Census (2014) results, Nakaseke District had a total population 197,703 people. Results also showed that most of the people in Nakaseke District reside in rural areas (158,349 (80.1%) compared to (39,354 (19.9%) who reside in urban centers. The gender distribution was reported to be males: 104,096 (52.7%) and females: 93,607 (47.3%). About 92.8% (183,569) of the population form the household population and only 7.2% (14,134) is Non-household. Kapeeka Sub-county had the highest population of 26,980 people while Butalangu Town Council had the least population of 3,873 people (Figure 6). Table 2 shows the population distribution per Sub-county for the different gender.

**Table 2: Population Distribution in Nakaseke District**

| | HOUSEHOLDS | | POPULATION | | |
|---|---|---|---|---|---|
| ***Sub-county*** | ***Number*** | ***Average Size*** | ***Males*** | ***Females*** | ***Total*** |
| Butalangu Town Council | 704 | 4.4 | 2147 | 1726 | 3873 |
| Kapeeka | 5894 | 3.9 | 15112 | 11868 | 26980 |
| Kasangombe | 4851 | 4.4 | 10929 | 10853 | 21782 |
| Kikamulo | 4243 | 4.3 | 9129 | 9148 | 18277 |
| Kinoni | 828 | 6.4 | 3451 | 2851 | 6302 |
| Kinyogoga | 2139 | 4.2 | 7266 | 4382 | 11648 |
| Kito | 2294 | 4.2 | 5079 | 4732 | 9811 |
| Kiwoko Town Council | 2653 | 4 | 5356 | 5657 | 11013 |
| Nakaseke | 4392 | 4.3 | 9481 | 9545 | 19026 |
| Nakaseke Town Council | 1992 | 3.3 | 3487 | 3751 | 7238 |
| Ngoma | 1138 | 6.1 | 4747 | 3388 | 8135 |
| Ngoma Town Council | 1602 | 3.6 | 3170 | 3125 | 6295 |
| Semuto | 5531 | 4.2 | 12056 | 11506 | 23562 |
| Semuto Town Council | 2820 | 3.8 | 5559 | 5376 | 10935 |
| Wakyato | 2498 | 4.5 | 7127 | 5699 | 12826 |

*Source: UBOS Census 2014*




| Sub-County | Total Household | Males | Females | Area Km² |
|---|---|---|---|---|
| Butalangu TC | 704 | 2147 | 1726 | 77 |
| Kasangombe | 4851 | 10929 | 10853 | 112 |
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| Kinoni | 828 | 3451 | 2851 | 454 |
| Kito | 2294 | 5079 | 4732 | 103 |
| Kiwoko TC | 2653 | 5356 | 5657 | 36 |
| Nakaseke | 4392 | 9481 | 9545 | 103 |
| Nakaseke TC | 1992 | 3487 | 3751 | 12 |
| Ngoma TC | 1602 | 3170 | 3125 | 74 |
| Semuto TC | 2820 | 5559 | 5376 | 16 |
| Kinyogoga | 2139 | 7266 | 4382 | 726 |
| Wakyato | 2498 | 7127 | 5699 | 524 |
| Semuto | 5531 | 12056 | 11506 | 144 |
| Kapeeka | 5894 | 15112 | 11868 | 139 |
| Ngoma | 1138 | 4747 | 3388 | 830 |

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

### *2.1.8 Economic activities*

Livestock production (for meat and milk),is the main economic activity in the northern part of the District i.e the cattle corridor which covers more than three quarters of the District. Crop production dominates the south with crops grown including; coffee, maize, beans, bananas, cassava, sweet potatoes, groundnuts vegetables such as tomatoes, cabbage, green pepper, egg plants, and fruits including pineapples, oranges, water melon, passion fruits, pawpaws and mangoes. These are mainly grown in the southern part of the District. About 90 percent of the farmers use traditional farming methods and techniques. This is a serious problem as it contributes to land degradation. In addition to crop cultivation, the southern population also carries out limited livestock rearing keeping poultry, pigs goats and cows. A considerable number of people are engaged in fishing in the area swamps. Charcoal production is the leading contributor in terms of District locally raised revenue, contributing over 60%. Trade is another growing economic activity in the District. Trade is mainly in domestic consumables and hardware, in all Town Councils and upcoming trading centres like Kapeeka and Kinyogoga.

## 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, floods, landslides, human, animal and crop diseases, pests, wildlife animal attacks, earthquakes, fires and conflicts among others. 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 six respondents (Chief Administrative Officer, District Environment Officer, District Production Officer, District Natural Resources Officer, District Planner and District Health Officer) was held at Nakaseke District Headquarters (…). At Sub-county level key informants included: Sub-county and Parish Chiefs and Community Development Officers.

FGDs were carried out in four purposively selected Sub-counties that were ranked with the highest vulnerability. FGDs comprising of an average of 12 respondents (crop farmers, local leaders and cattle keepers) were conducted at Kasagombe, Sub-county ()Nakaseke, Sub-county () and Semuto, Town Council (). 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.

### *3.2.2 Data verification and validation*

In collaboration with OPM, a five-day 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.

## 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.

## 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 Nakaseke 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 there weren't any incidences of landslides in Nakaseke District. However, participants reported incidences of rock falls where stone mining in Kisega Parish of Semuto Sub-county, Kalagal in Nakaseke Sub-county and stone quarrying at Lule stone quarry in Semuto Town Council. Incidences of soil erosion were reported to be high on the bare hills of Semuto, Kapeeka, Kasangombe and Nakaseke Sub-counties. 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.

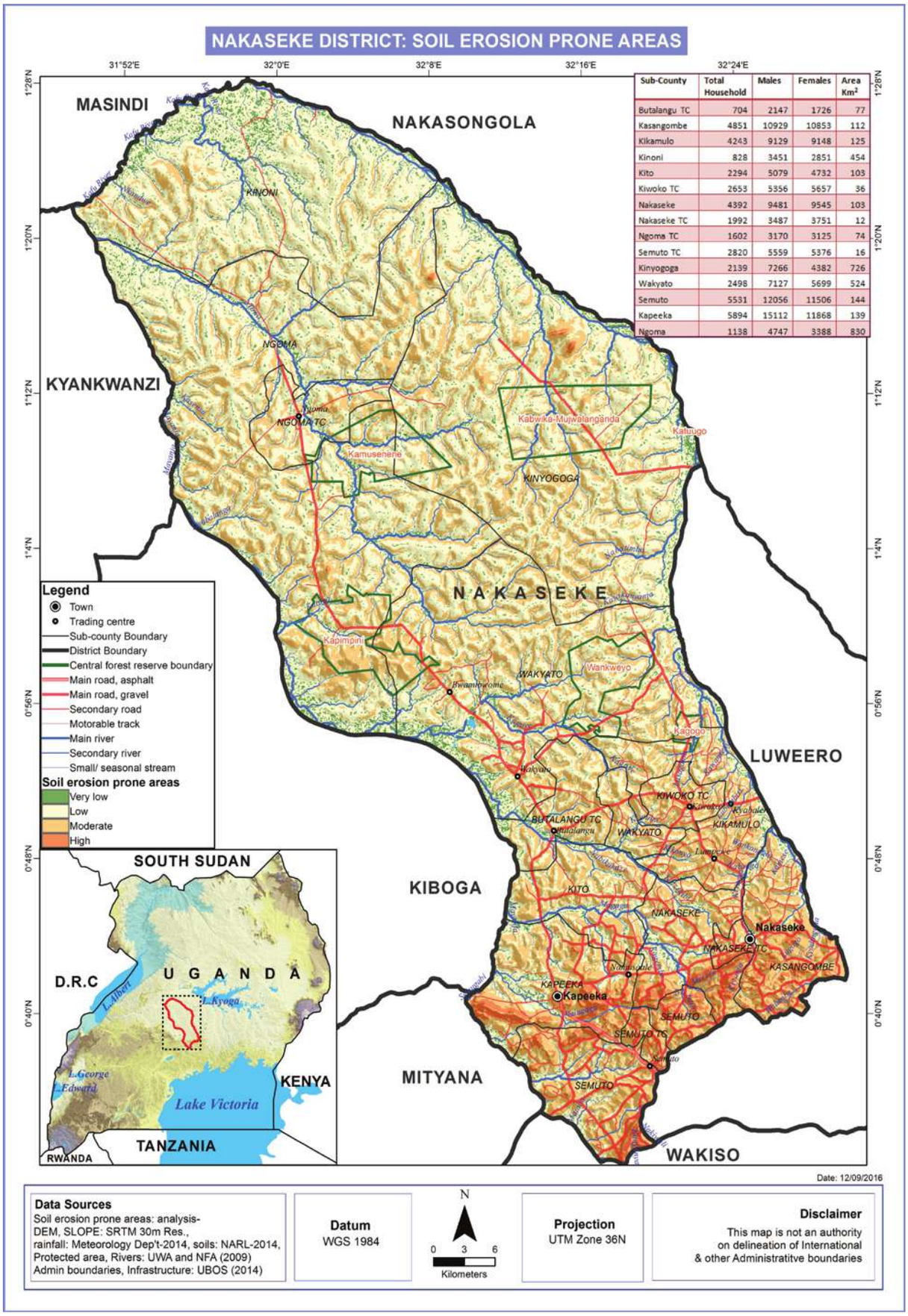



**Figure 7: Landslides, Rock fall, Soil erosion prone areas, Nakaseke District**

### *4.1.2 Earthquakes and faults*

Participants of the focus group discussion indicated that earthquakes weren't a serious problem in Nakaseke District. However, it was observed that the entire District only experiences minor tremors.

## 4.2 Climatological and Meteorological Hazards

### *4.2.1 Floods*

Results from the focus group discussions revealed that floods usually occur in the low lying areas especially during the rainy seasons. Participants observed that floods wash away and at times submerge crops such as beans, sweet potatoes, cassava and maize thus causing food insecurity and considerable economic losses. It was reported that in 2013, about 2 children were killed by floods in Biduku Village, Biduku Parish of Kinoni Sub-county. In Kinyogoga and Kinoni Sub-counties during heavy rain seasons school going pupils abandon school because some sections of roads are cut off by floods. Another case was reported in April 2016, Wakyato and Kapeeka Sub-counties, where sections of roads were cut off in wetlands of Kizzi-kibi and Kayiwaggobe respectively. Other areas with similar problems include Kyajjinja in Semuto Sub-county and some wetland sections Nakaseke and Kito Sub-counties. This information was integrated with the spatial modelling using socio-ecological spatial data i.e. generated from 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).

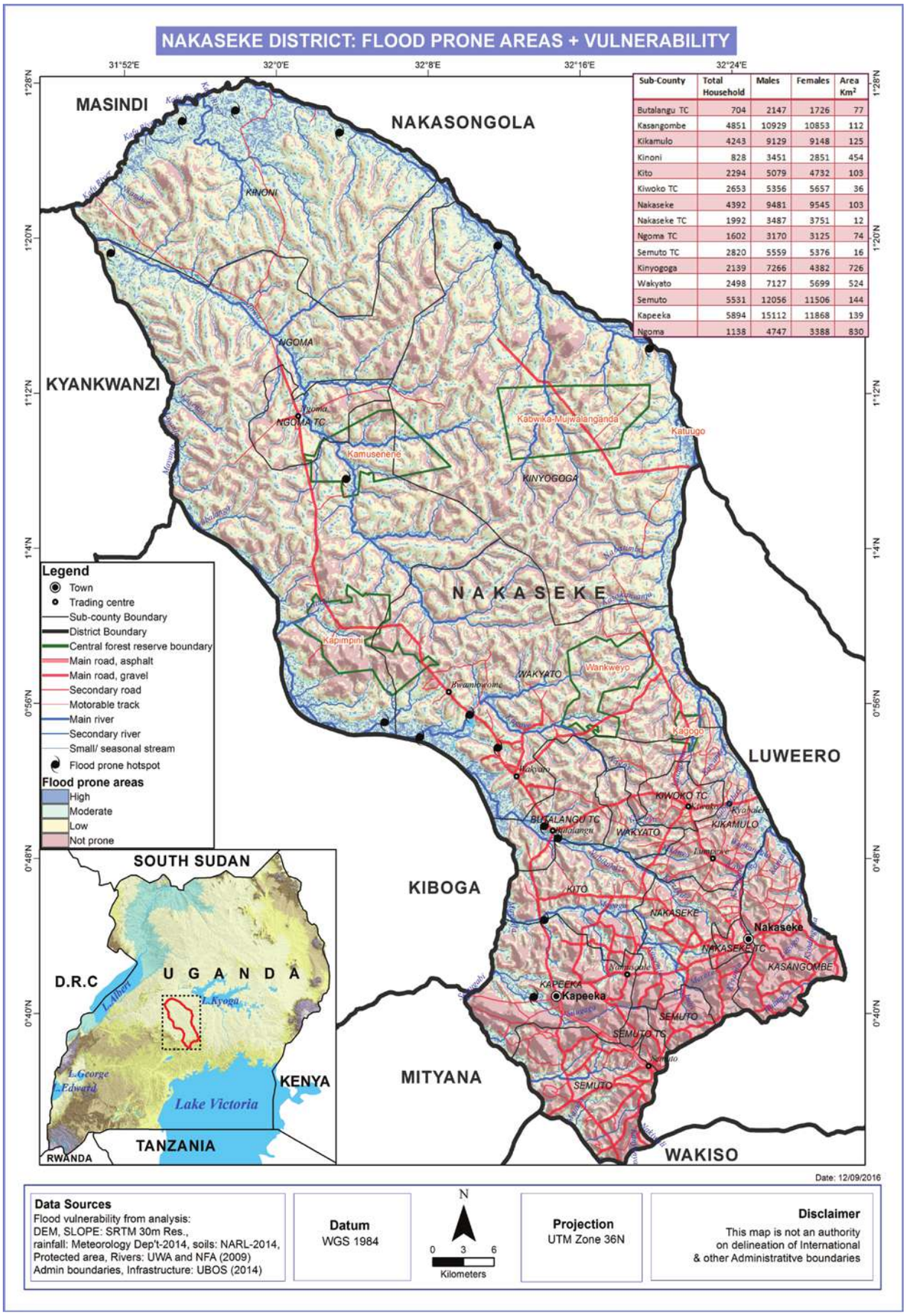
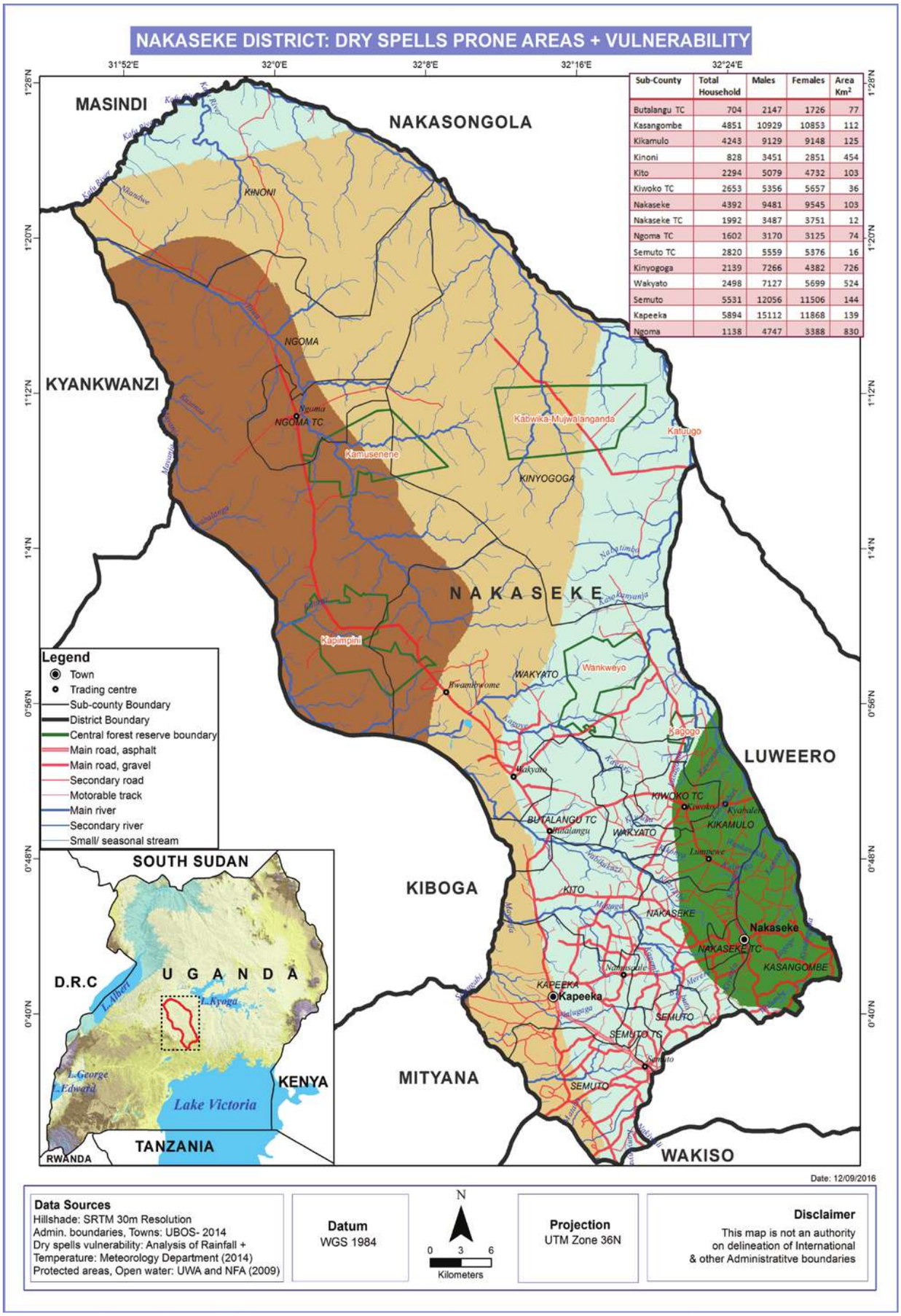



**Figure 8: Flood prone areas and Ranking, Nakaseke District**

### *4.2.2 Drought/long dry spells.*

Participatory assessments through focus group discussions indicated that prolonged dry spells was a serious problem in Nakaseke District in the dry season .i.e. November to March. This could be attributed to its location in the cattle corridor. Participants observed that drought and prolonged dry spells have caused shortage scarcity of water and pastures, low milk and crop production and increased incidences of pests and diseases. The participants also mentioned that termite infestation on pastures is always high in the dry season. It was reported that some households migrate to Rivers Mayanja and Lugogo in search of water for their animals during dry seasons. This information was integrated with the spatial modeling using socio-ecological spatial data i.e. generated from Rainfall and Temperature (Uganda National Meteorological Authority, 2014) using the Standardized Precipitation Index.

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| Semuto | 5531 | 12056 | 11506 | 144 |
| Kapeeka | 5894 | 15112 | 11868 | 139 |
| Ngoma | 1138 | 4747 | 3388 | 830 |

**Figure 9: Drought Prone areas and Vulnerability Ranking, Nakaseke District**

### *4.2.3 Hailstorms*

Results from the participatory assessments showed that Kasangombe, Kapeeka, Semuto, Kito and Nakaseke Sub-counties were the most affected by hailstorms in Nakaseke District. In 2012 & 2013, these areas were heavily hit by hailstorms. Participants observed that hailstorms come along with strong winds that destroy crops especially maize, cassava and banana plantations thus causing food insecurity. Participants also reported that hailstorms cause injury to livestock also.

### *4.2.4 Strong winds*

The participants of the focus group discussions reported that strong winds are experienced at the onset of the rainy seasons. It was observed that strong winds usually blow off roof tops of houses and schools and also uproot trees and banana plantations. In 2015, Kyanya Ward in Butalangu Town Council was swept with strong winds that destroyed all crops and houses. Other areas affected include; Kinyogoga, Wakyato, Kapeeka, Nakaseke and Kasangombe Sub-counties are the most affected. In 2012, Kapeeka Primary School was de-roofed, in 2013 Wakayamba Primary School from Kikamulo was also de-roofed, while several other schools in the District face similar challenges.

### *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. Results from the participatory assessments indicated that there have been increased incidences of lightning occurrences in Nakaseke District. Participants reported that in the recent past, school children and cattle keepers were killed by lightning in Kinyogoga and Ngoma Sub-counties respectively. It was reported that most of the schools in Nakaseke District do not have lightning conductors and they are therefore at a risk of being struck by lightning.

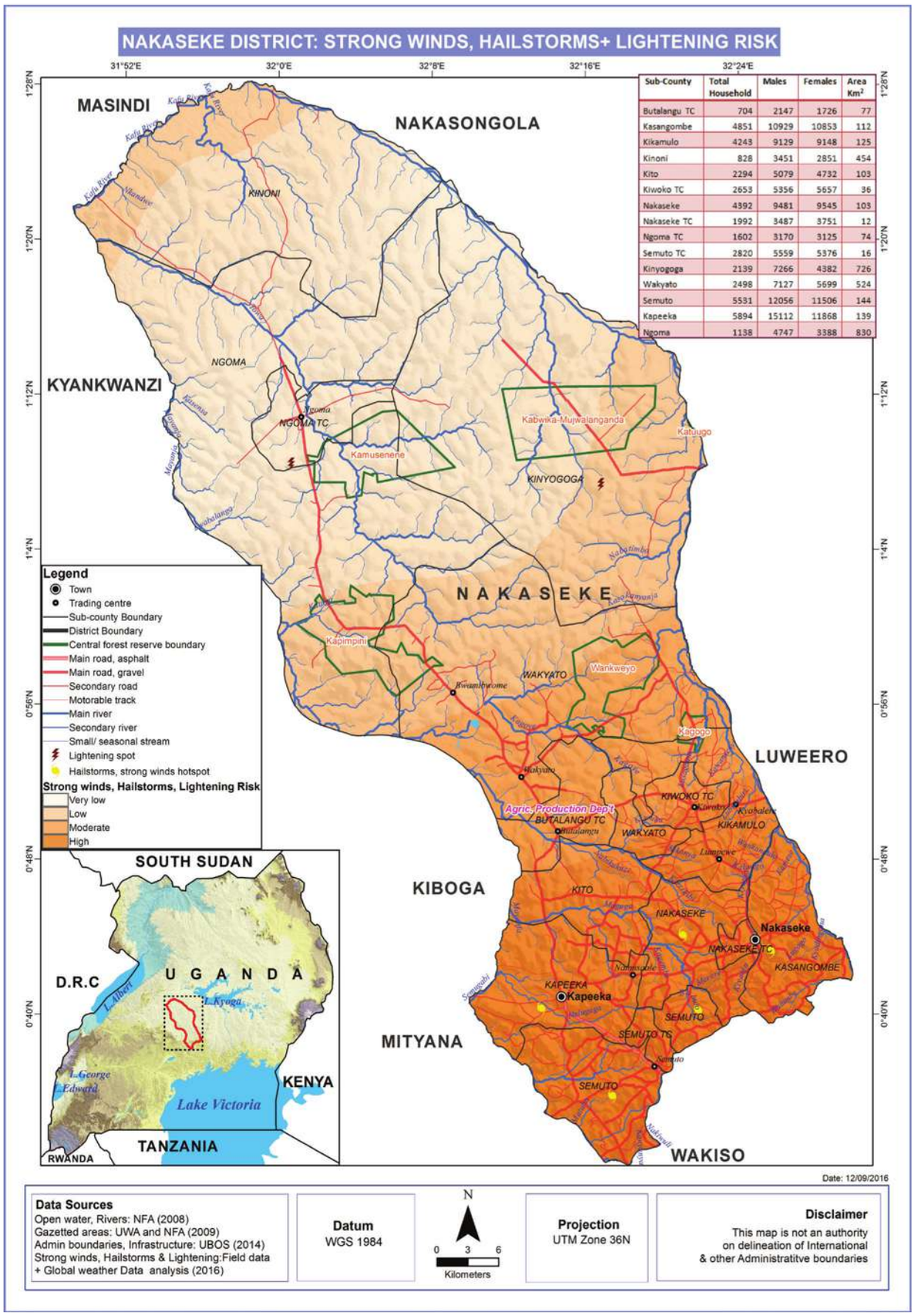



**Figure 10: Strong winds, Hailstorms and Lightning Hotspots and Vulnerability, Nakaseke District**

## 4.3 Ecological and Biological Hazards

### *4.3.1 Crop Pests and Diseases & Termite Infestation*

Participatory assessments through focus group discussions indicated that the entire Nakaseke District was vulnerable to crop pests and diseases. Banana and coffee plantations were the most affected by crop pests and diseases. The most prominent crop diseases were banana bacterial wilt, coffee wilt disease and tomato blight. The most reported crop pests were; black coffee twig borer, maize stalk borer and aphids. The Sub-counties of Nakaseke, Kapeeka, Kikamulo, Wakyato, Semuto, Kito and Kasangombe were the most affected by crop pests and diseases. Interactions also revealed that termite infestation was a serious problem especially in all Sub-counties in the Northern part of the District including Wakyato, Ngoma, Kinoni, Kinyogoga and Town Councils of Butalangu and Ngoma. The destroy all pastures especially in the dry season leading to scarcity of pastures and development of bare land patches.

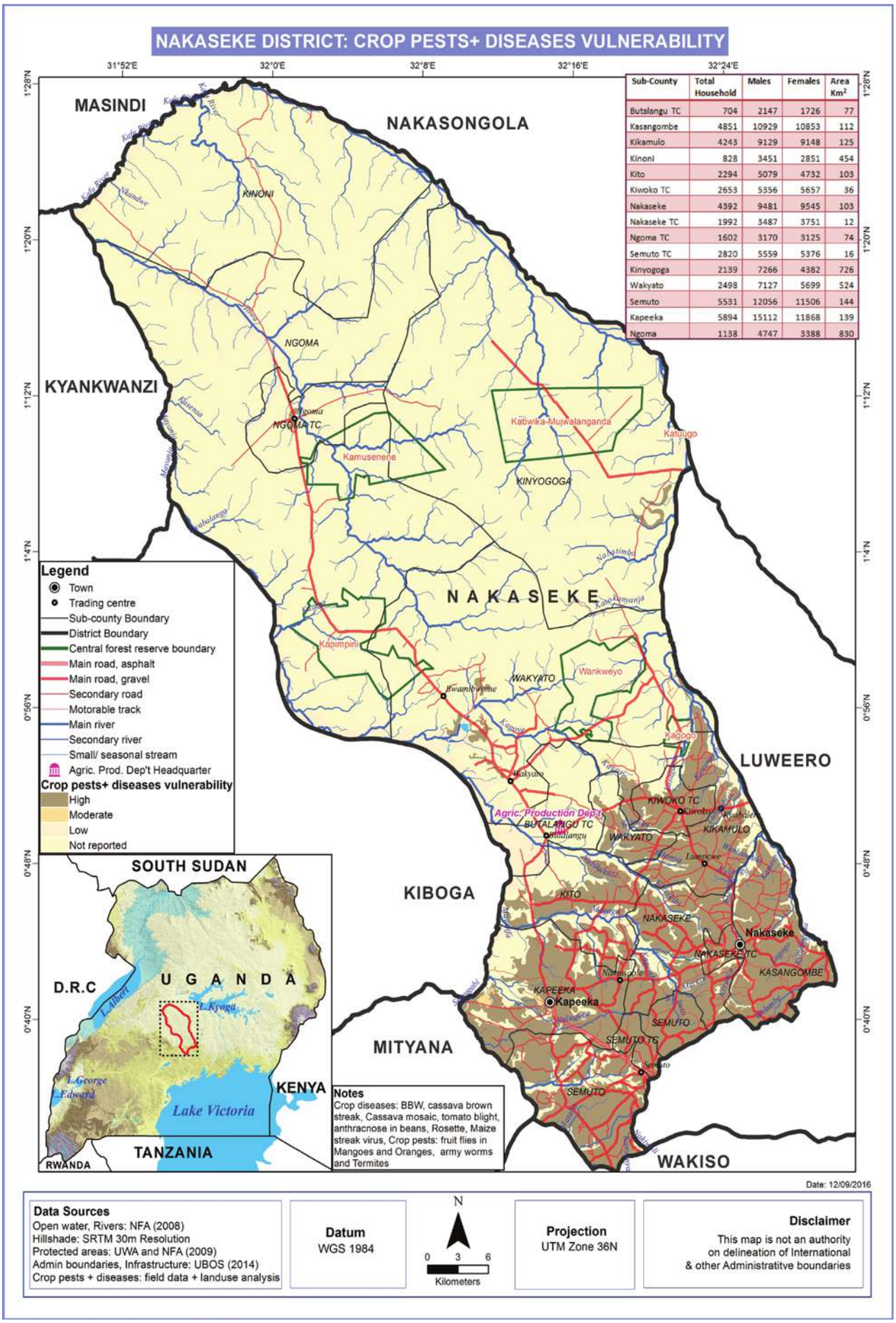



**Figure 11: Crop Pests and Diseases Vulnerability, Nakaseke District**

### *4.3.2 Livestock parasites, vectors and Diseases*

Results from the focus group discussions indicated that livestock pests and diseases were a serious problem because Nakaseke District is located in the cattle corridor. Participants revealed that the Sub-counties of Ngoma, Wakyato, Kinoni, Kinyogoga and Ngoma Town Council are prone to. These areas for example suffered foot and mouth disease quarantine for two year (2014 & 2015). Reports also indicated that Nakaseke, Kito and Kapeeka Sub-counties were mostly affected by swine fever. The other most notable livestock disease was Lumpy skin disease which is prominent in Nakaseke Sub-county. In general, the most affected Sub-counties are Ngoma, Wakyato, Kapeeka and Nakaseke.

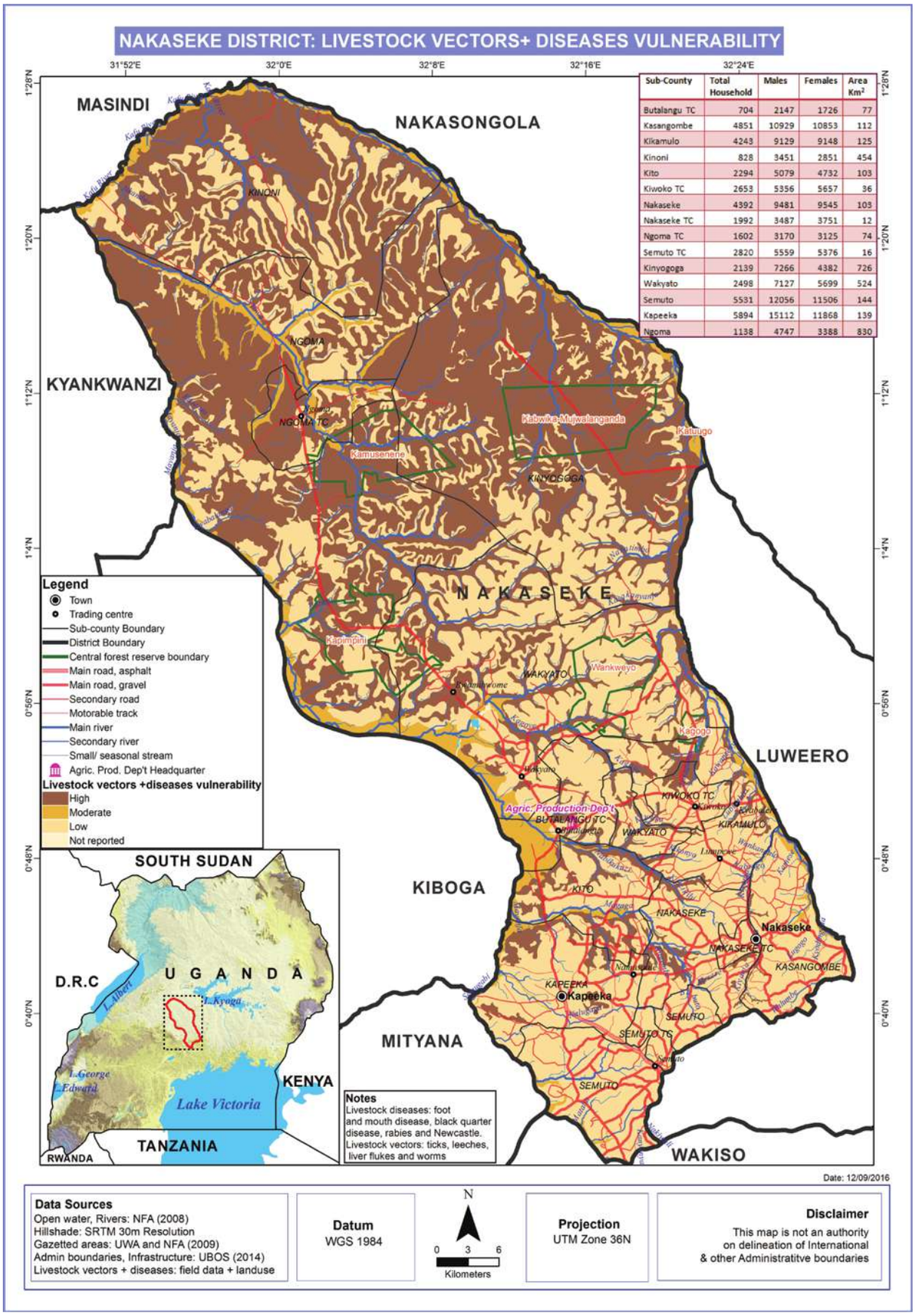
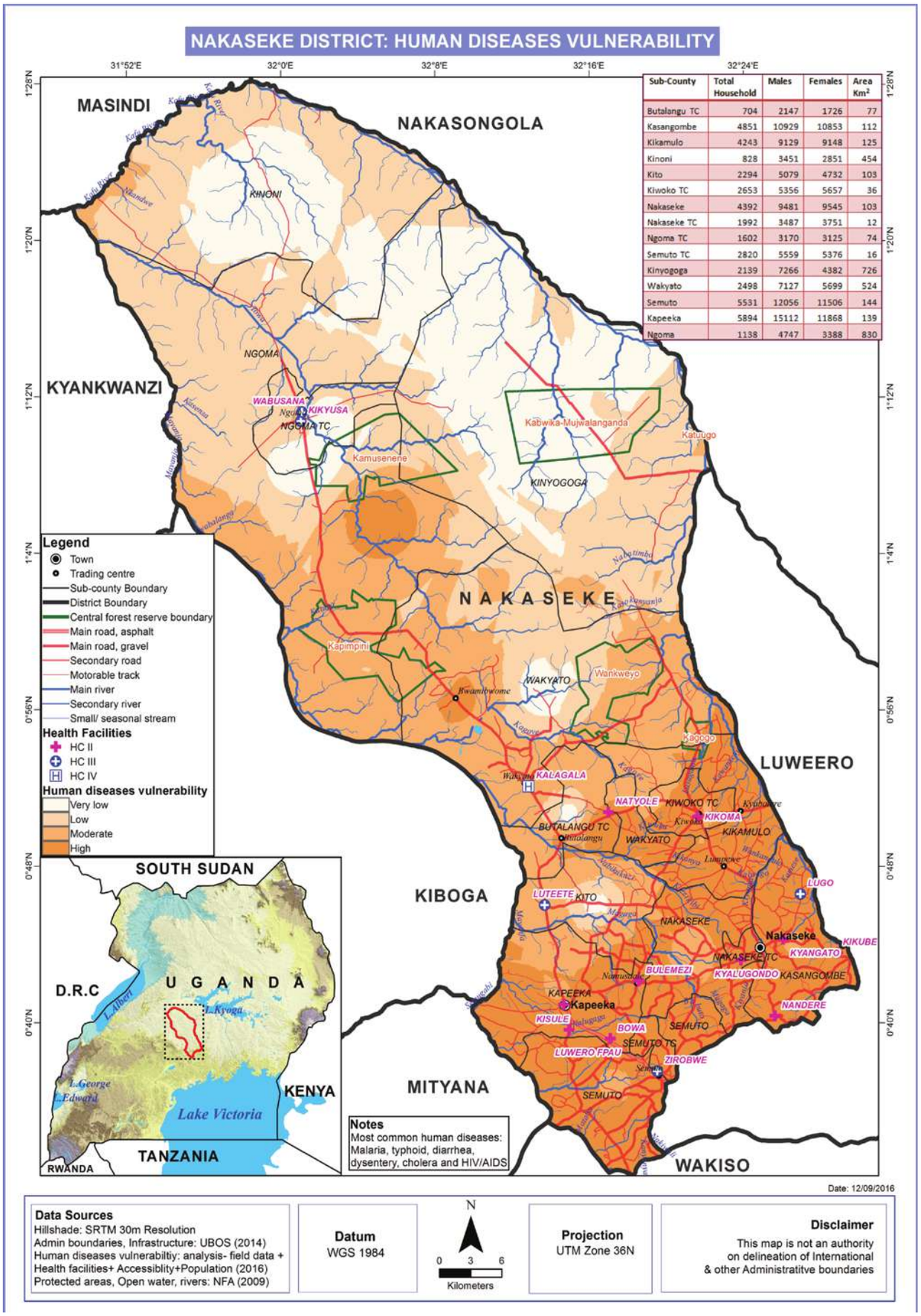



**Figure 12: Livestock Pests and Diseases Vulnerability, Nakaseke District**

### *4.3.3 Human Diseases outbreaks*

Participants in the series of focus group discussions held indicated that the most prevalent human diseases in Nakaseke District were malaria, typhoid, pneumonia, diarrhea, brucellosis, HIV/AIDS and respiratory tract infections. Participants reported that there was a serious outbreak of typhoid in the Sub-counties of Nakaseke, Kikamulo and Nakaseke Town Council due to limited access to safe water. Reports indicated that HIV/AIDS prevalence rates were high in Butalangu, Kiwoko, Nakaseke, Ngoma and Semuto Town Councils and Kapeeka Town.

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| Semuto TC | 2820 | 5559 | 5376 | 16 |
| Kinyogoga | 2139 | 7266 | 4382 | 726 |
| Wakyato | 2498 | 7127 | 5699 | 524 |
| Semuto | 5531 | 12056 | 11506 | 144 |
| Kapeeka | 5894 | 15112 | 11868 | 139 |
| Ngoma | 1138 | 4747 | 3388 | 830 |

**Figure 13: Human Disease Outbreaks Vulnerability, Nakaseke District**

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

Participatory assessments through focus group discussions revealed that vermin and wildlife animal attacks were a serious problem especially in areas along Rivers Mayanja, Lugogo and Kafu. Incidences of wild-life animal attacks were reported at Nabisojjo lake in Nabissojjo Village, Kirinda Parish, Wakyato Sub-county where hippos destroyed crops in 2014. It was also reported that in 2010, a woman was killed by crocodiles on River Kafu. Participants also reported that in 2005, local communities in Gayaza and Wakyato Sub-counties were attacked by elephants. Cases of wild pigs destroying crops were mostly reported in Wakyato, Kinoni, Kito, Kapeeka, Ngoma and Kinyogoga Sub-counties.

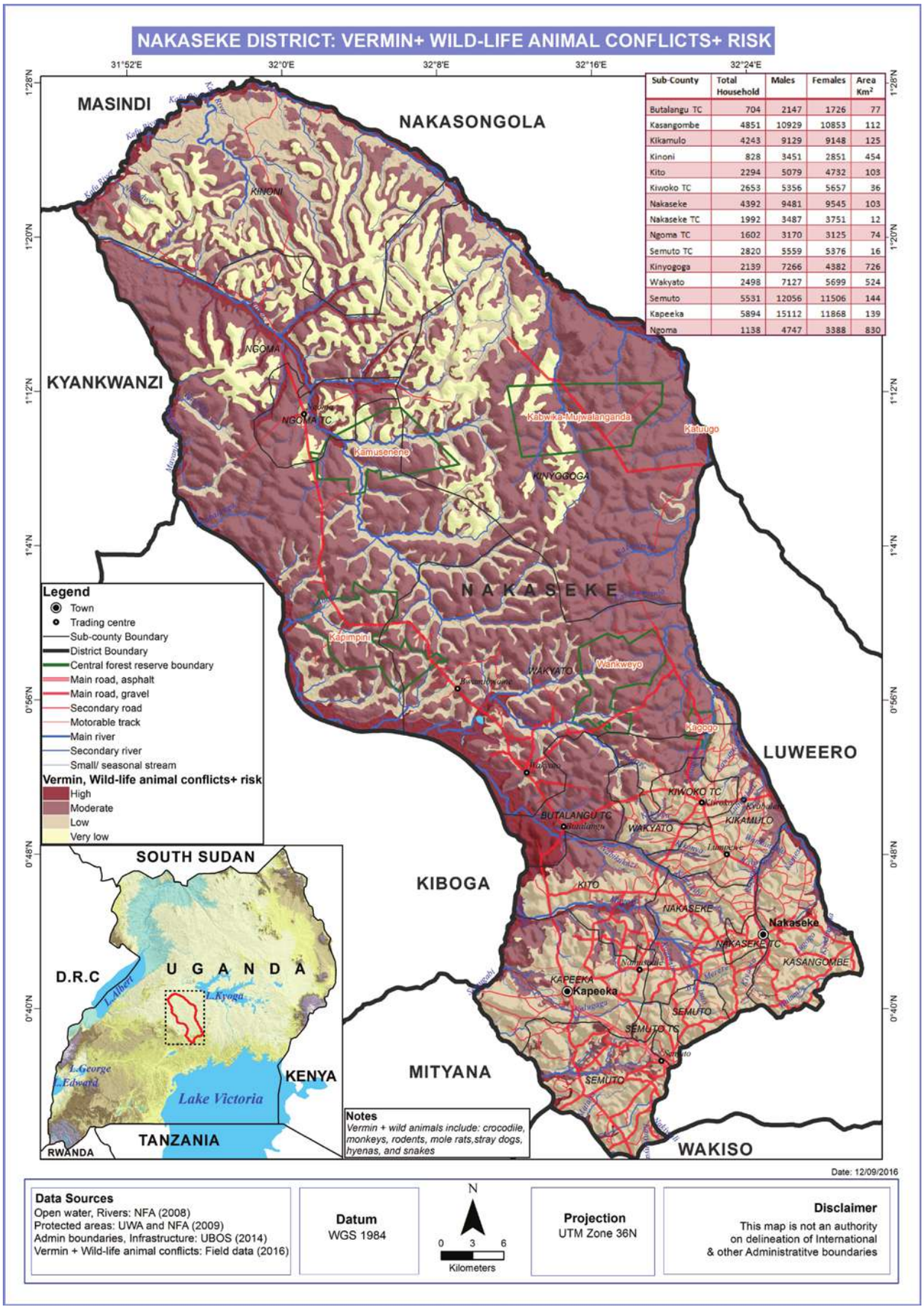


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**Figure 14: Vermin, Wildlife animal attacks vulnerability, Nakaseke District**

### *4.3.5 Invasive species*

Results from the discussions indicated that *Lantana camara, others by local names include; Kilooba* and *Kakamba* were the most reported invasive species in Nakaseke District. Participants mentioned that these invasive species usually harbor tsetse flies and also dominate grazing lands and thus destroy pastures that would have been palatable for animals. *Lantana camara* was dominant in Wakyato, Kikamulo and Kapeeka Sub-counties. *Kakamba spp,* was dominant in Kinyogoga and Kinoni Sub-counties.

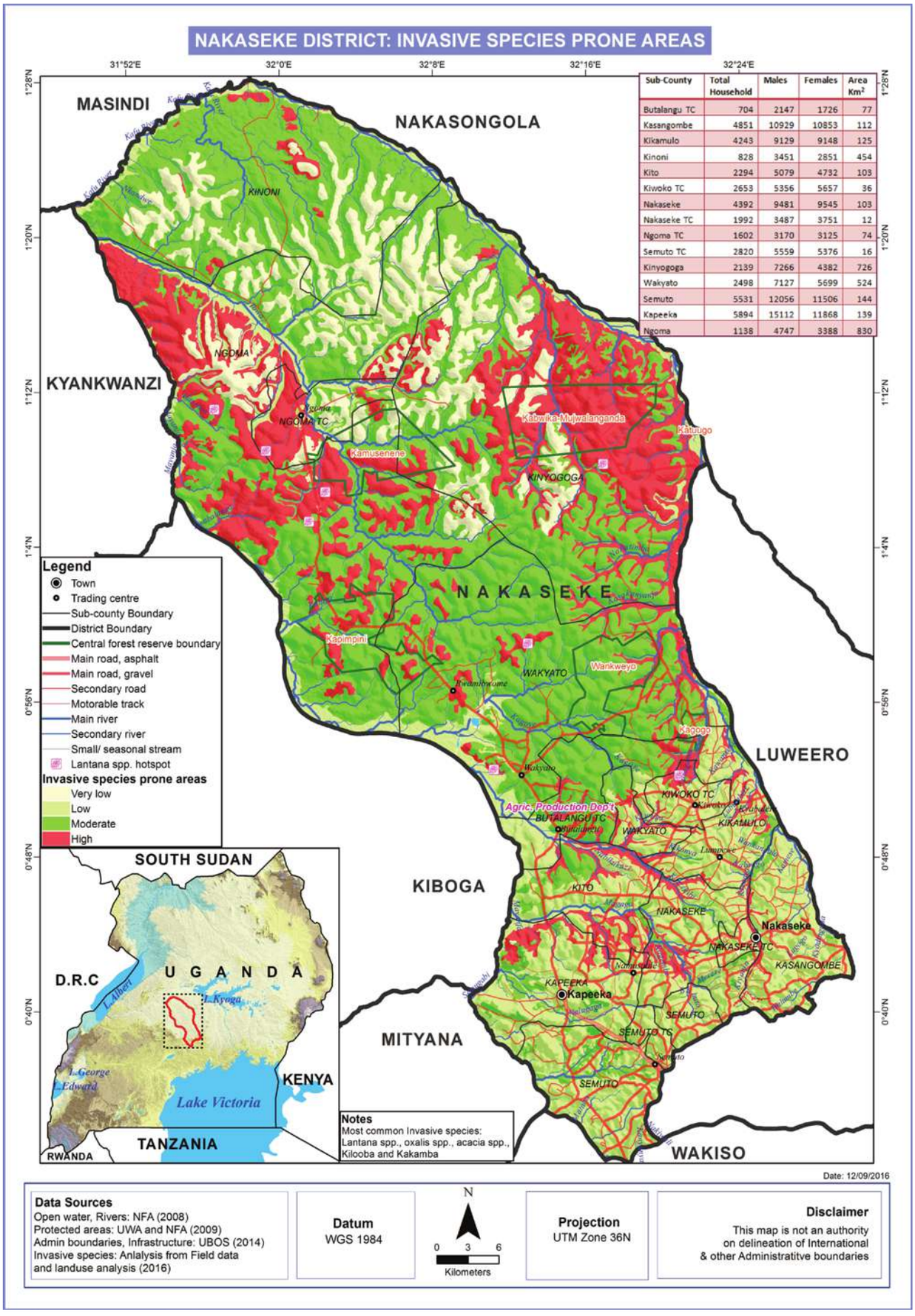


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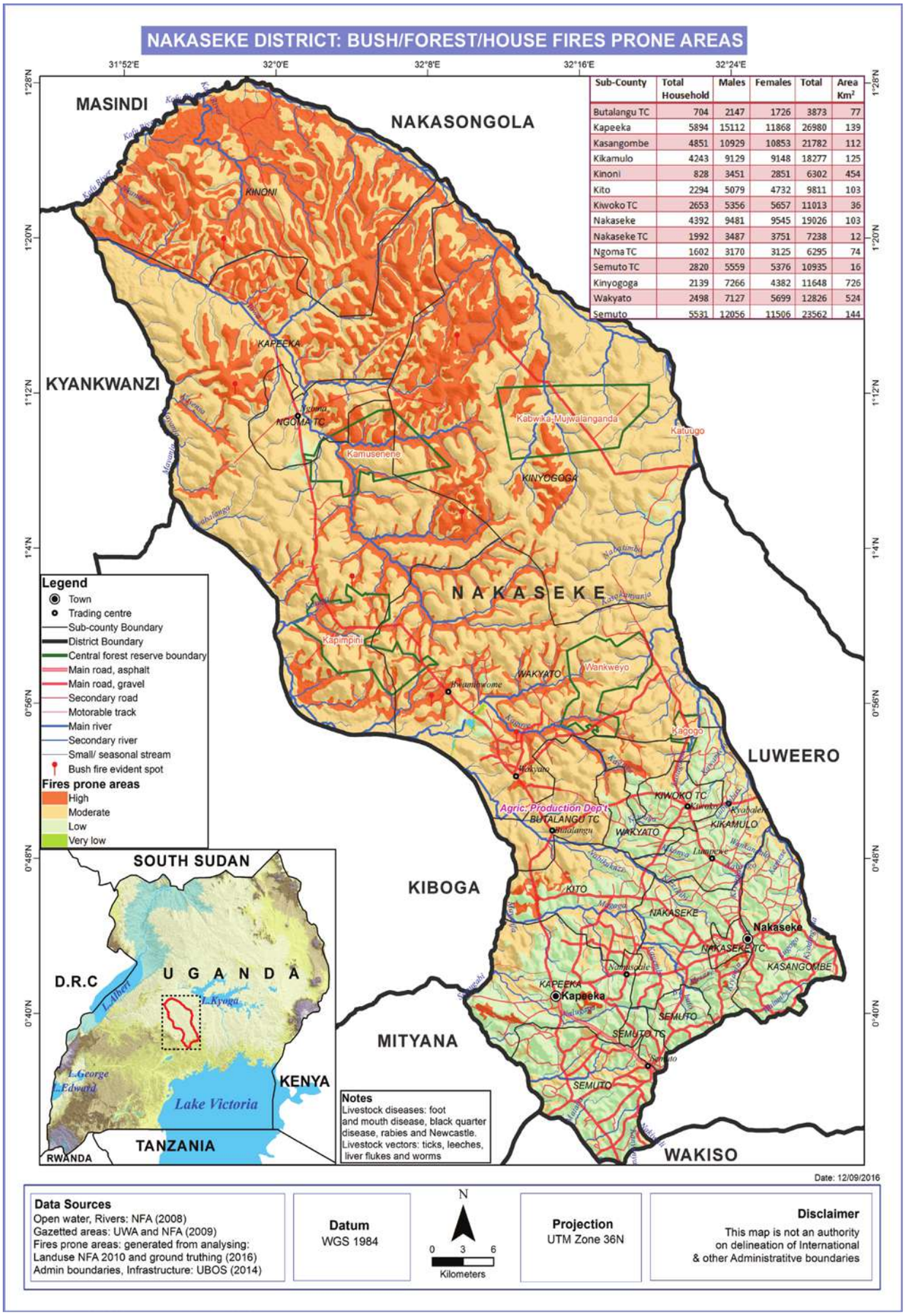
**Figure 15: Invasive Species Ranking, Nakaseke District**

## 4.4 Human Induced and Technological Hazards

### *4.4.1 Bush fires*

Results from participatory assessments showed that bush burning was a very serious problem in Nakaseke District during the dry seasons. Participants indicated that cattle keepers particularly in the Sub-counties of Ngoma, Kapeeka, Wakyato, Kinoni and Kinyogoga and Butalangu Town Council, practice bush burning at the end of the dry seasons for regeneration of fresh pastures at the onset of the rainy season. A 10 acre maize plantation was recently burnt in Kyanja, Butalangu Town Council as a result of uncontrolled bush burning (2015)

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| Kinyogoga | 2139 | 7266 | 4382 | 11648 | 726 |
| Wakyato | 2498 | 7127 | 5699 | 12826 | 524 |
| Semuto | 5531 | 12056 | 11506 | 23562 | 144 |

**Figure 16: Bush fires Hot spot areas and Vulnerability Ranking, Nakaseke District**

### *4.4.2 Land conflicts*

Participants indicated that land disputes were a serious problem in the entire Nakaseke District. It was reported that there is an administrative boundary conflict between Kinoni and Ngoma Sub-counties. Most of the registered land conflicts are between land lords and squatters. These conflicts are usually settled in the RDCs office and magistrates court.

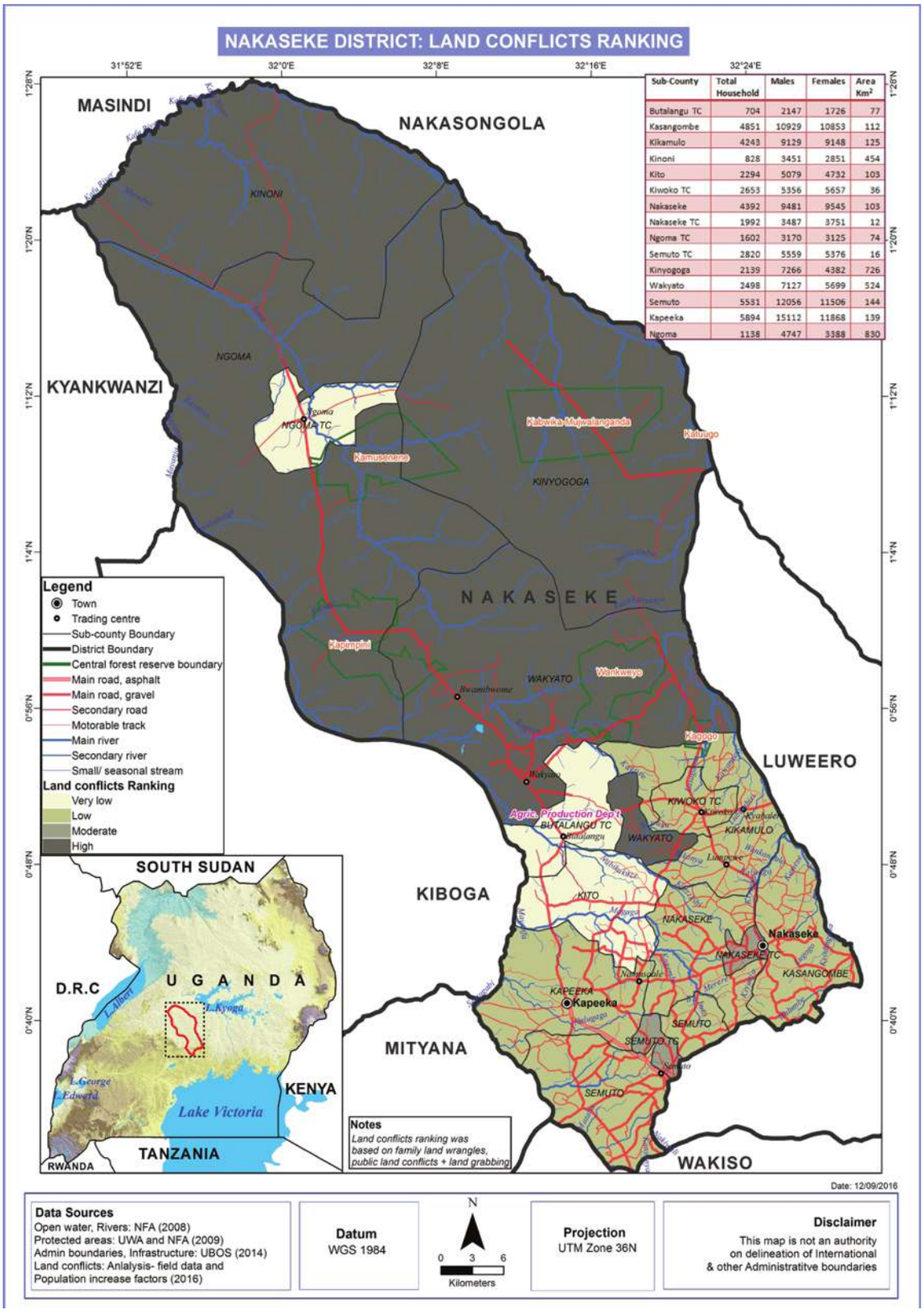
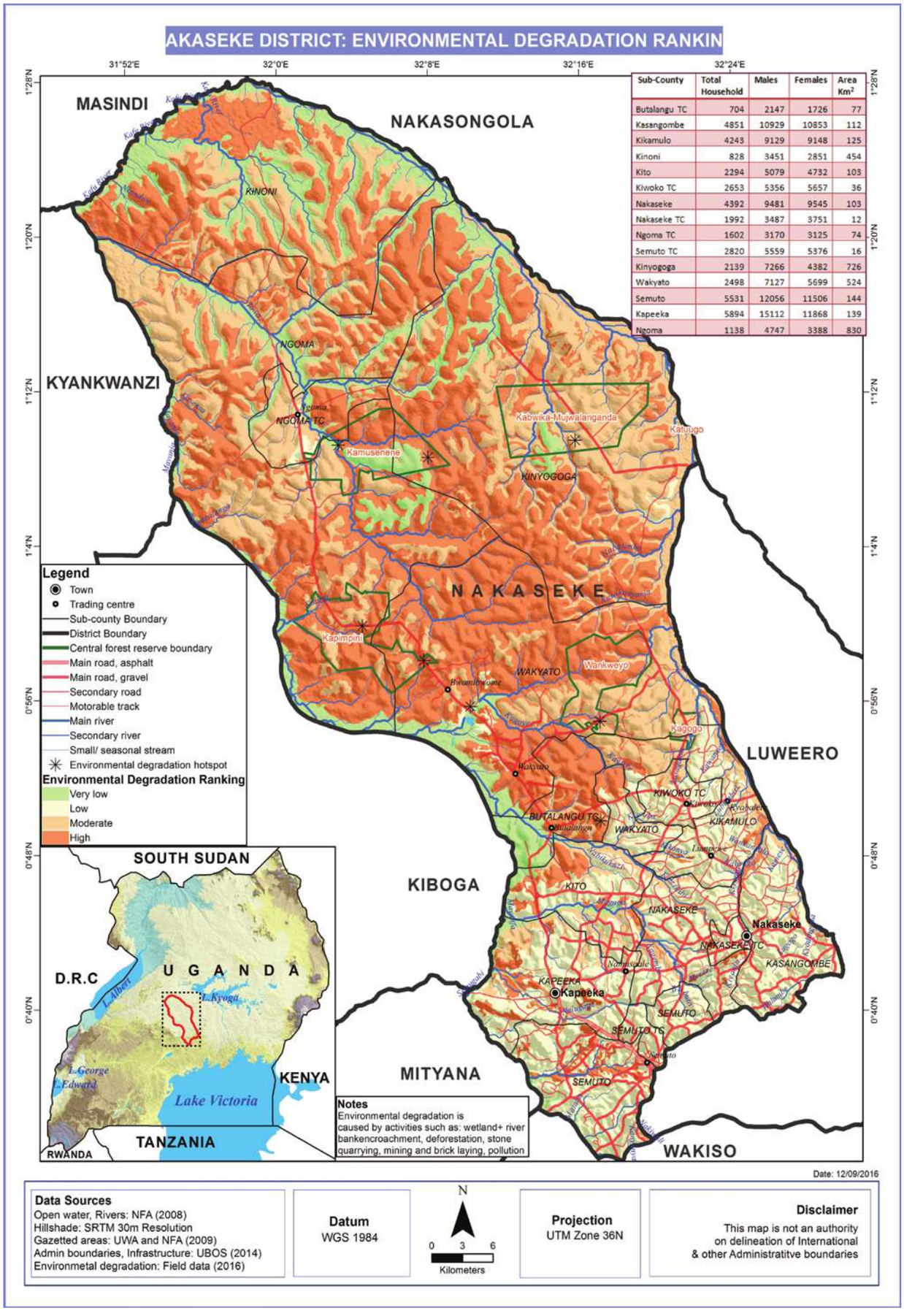



**Figure 17: Land Conflicts Ranking, Nakaseke District**

### *4.4.3 Environmental Degradation*

The most reported forms of environmental degradation in Nakaseke District included; deforestation due to charcoal production, wetland reclamation, overgrazing, stone quarrying though on a small scale, brick making and sand mining. Participants reported that most of the forest reserves have been converted into land for livestock grazing for example at Kamusenene forest reserve in Ngoma and Kinyogoga Sub-counties and Wankweyo and Kabwika forest reserves in Wakyato Sub-county. In some of these areas land has been leased to commercial tree growers. Overgrazing was common in the Sub-counties of Ngoma, Wakyato, Kinoni and Kinyogoga in the northern part of the District. Nabiika Forest Reserve in the south has been converted into cropland. Wetland degradation is a serious challenge in the south especially in wetlands of Semuto, Kapeeka and Kito along river Mayanja and in Nakaseke Kasangombe and Kikamulo along wetlands of river Lugogo.




| Sub-County | Total Household | Males | Females | Area Km² |
|---|---|---|---|---|
| Butalangu TC | 704 | 2147 | 1726 | 77 |
| Kasangombe | 4851 | 10929 | 10853 | 112 |
| Kikamulo | 4243 | 9129 | 9148 | 125 |
| Kinoni | 828 | 3451 | 2851 | 454 |
| Kito | 2294 | 5079 | 4732 | 103 |
| Kiwoko TC | 2653 | 5356 | 5657 | 36 |
| Nakaseke | 4392 | 9481 | 9545 | 103 |
| Nakaseke TC | 1992 | 3487 | 3751 | 12 |
| Ngoma TC | 1602 | 3170 | 3125 | 74 |
| Semuto TC | 2820 | 5559 | 5376 | 16 |
| Kinyogoga | 2139 | 7266 | 4382 | 726 |
| Wakyato | 2498 | 7127 | 5699 | 524 |
| Semuto | 5531 | 12056 | 11506 | 144 |
| Kapeeka | 5894 | 15112 | 11868 | 139 |
| Ngoma | 1138 | 4747 | 3388 | 830 |

**Figure 18: Environmental Degradation Ranking, Nakaseke District**

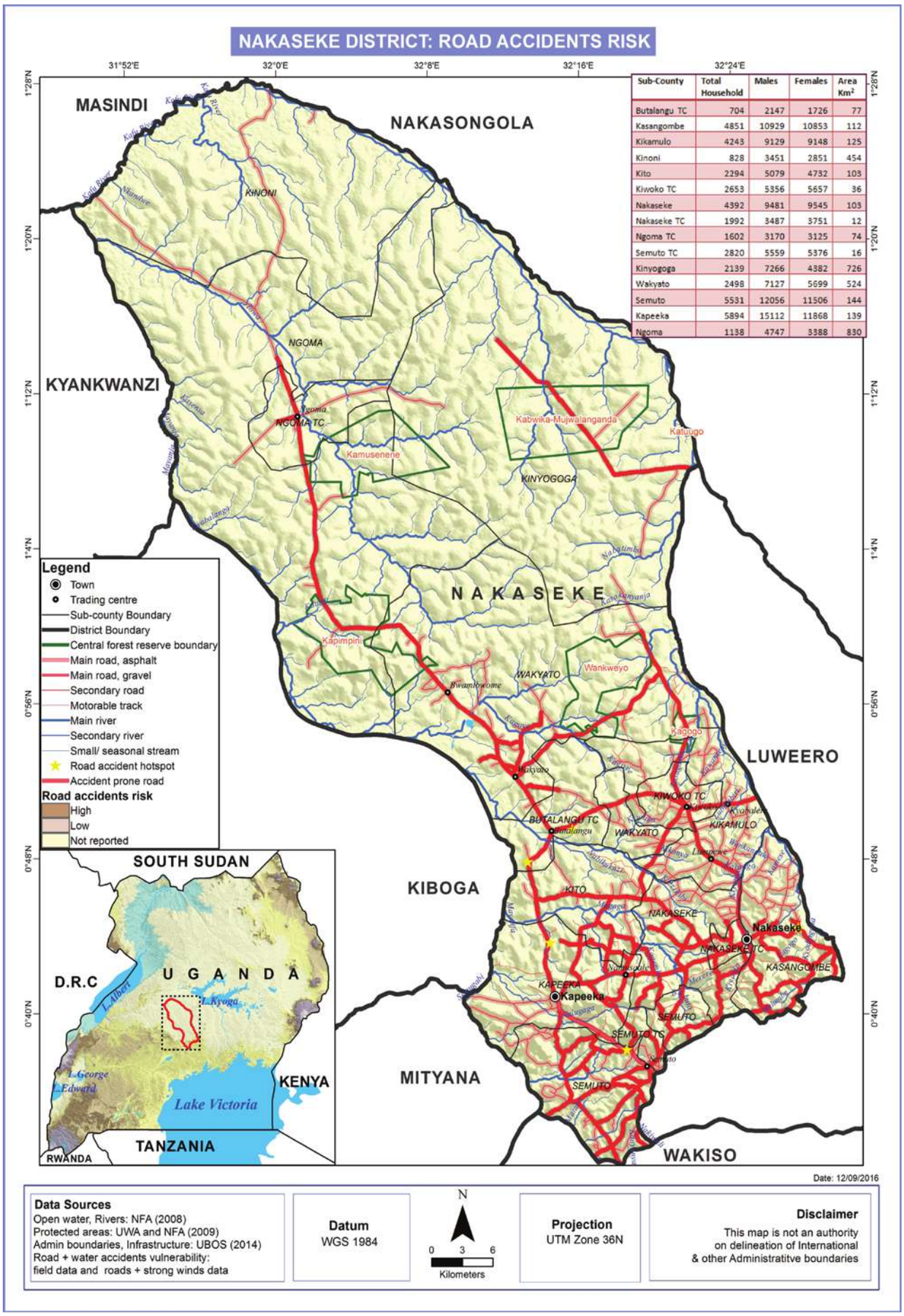



**Figure 19: Road Accidents Hots pots and Vulnerability, Nakaseke District**

## 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 Nakaseke District were 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 2).

Table 3 (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 3). Table 4 shows Hazard assessment for Nakaseke District.

## Table 3: Components of Vulnerability in Nakaseke District

| Vulnerability | Exposure | | | Susceptibility | | | Resilience |
|---|---|---|---|---|---|---|---|
| | **Hazards** | **Elements at Risk** | **Geographical Scale** | **Susceptibility** | **Geographical Scale** | **Coping strategies** | **Geographical Scale** |
| **Socio-economic component** | Rock falls and Soil erosion | - Crops near low lands /welands/rivers<br>- land | Parish | - Complete crop failure | Parish | -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 e.g. houses, schools, roads adjacent to flood plain | Parish | - Livestock loss<br>- Foot rot<br>- Destruction of crops<br>- Destruction of infrastructure e.g. houses, schools, roads adjacent to flood plain | Parish | -Migration<br>-Sensitization on wetland conservation<br>-Dig trenches | Parish |
| | Drought | - Livestock<br>- Crops<br>- Human population<br>- water sources | Village | - Hunger & poverty<br>- Livestock loss<br>- Crop failure<br>- Food insecurity<br>- Shortage of pasture<br>- Shortage of water<br>- Spread of livestock epidemics<br>- Livestock mortalities | Village | -Migration<br>-Sensitization on tree planting<br>-Promote drought resistant crops<br>-Plant quick maturing crops.<br>-Buy food from elsewhere | Village |
| | 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 e.g. houses, schools, roads adjacent to flood plain | Parish | - Promote tree planting around buildings to act as wind breakers.<br>-Promote afforestation & re-aforestation in the area | Parish |
| | Crop Pests and Diseases | -Crops | District | - Complete crop failure<br>- Food insecurity<br>- Income insecurity<br>- Domestic violence<br>- | District | - Spraying<br>- Cut and burry affected crops<br>-Sensitization on crop disease management | District |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Socio-economic component** | Livestock Pests and Diseases | -Livestock (cattle, goats etc.) | District | - Loss of livestock<br>- Reduced livestock Productivity<br>-Reduced incomes | 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<br>- Encourage community to carry out test & sensitise them on HIV/ AIDS & STDs<br>-Encourage community to always go to hospitals/Health Centres. | District |
| | Invasive species | -indigenous species<br>-Animals | District | - Outcompete the indigenous spp., suppress growth of indigenous spp<br>- Loss of indigenous spp.<br>- Complete crop Failure<br>- suppress growth of pasture<br>-some are poisonous to livestock<br>-Harbour vectors like tse-tse flies | District | - Cut and burn<br>-Sensitization on Invasive species management<br>- Spray with herbicides e.g 2,4 D<br>-Promote use of invasive weed species in the making of charcoal briquettes. | 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<br>-Loss of lives<br>-Land degradation through soil burning. | Sub-county | -Sensitization<br>- Fire control measures: firebreaks, fire lines and fire fighting equipments<br>-Formation & enforcement of bye-laws/ordinance against bush burning. | 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 & enforce traffic rules | Sub-county |
| | Land conflicts | - Human population | Village | -Loss of lives<br>-Family violence and break outs<br>-retards development | Village | - Community dialogue<br>- District court in charge of land issues | Village |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Socio-economic component** | 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 and Vermin Officer<br>- Guard gardens<br>- Recruit & equip Vermin Control Staff<br>-Poison<br>-Set traps to kill some.<br>-Put scare crows in gardens.<br>-Hunt and kill<br>-Fence off water collection points from 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<br>-increased incidences of env't related diseases | Sub-county | -Sensitization on wetland conservation<br>-Sensitization & promotion of tree plating<br>-Setting bi-laws | Sub-county |
| **Environmental component** | Soil erosion | - Land/soil<br>- Crops near rivers and wetlands areas | Parish | - Loss of fertility<br>- Complete crop Failure<br>- Food & income insecurity.<br>- Domestic violence | Parish | -Migration<br>-Sensitization by both Government and non-Governmental agencies<br>- Promote Conservation Agricultural practices. | |
| | 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 | |
| | Floods | - Livestock adjacent to flood plain<br>- Crops on flood plain<br>- Infrastructure e.g. houses, schools, roads adjacent to flood plain | Parish | - Livestock loss<br>- Destruction of crops<br>- Destruction of infrastructure e.g. houses, schools, roads adjacent to flood plain | Parish | -Migration<br>-Sensitization on wetland conservation<br>-Dig trenches | |
| | Drought | - 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<br>- Plant quick maturing crops<br>- Plant drought resistant crops. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Environmental component** | 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 e.g. houses, schools, roads adjacent to flood plain | Parish | | |
| | Crop Pests and Diseases | -Crops | District | - Complete crop Failure<br>-Food insecurity<br>-Income insecurity | District | - Spraying<br>- Cut and burry affected crops<br>-Sensitization on crop disease management<br>-Plant resistant crop varieties | |
| | Livestock Pests and Diseases | -Livestock (cattle, goats etc.) | District | - Loss of livestock<br>- Reduced livestock Productivity<br>-Income insecurity | District | - Vaccination<br>- Burry and burn animals that have died from infection<br>- Quarantine<br>- Encourage farmers to promote resistant breeds of animals. | |
| | Human Disease outbreaks | - Human Population | District | - Loss of lives<br>- Failure to work/ general body weakness and poverty. | District | - Mass Immunization<br>- Use of mosquito nets<br>- Sensitization on personal hygiene and sanitation | |
| | Invasive species | -indigenous species<br>-Animals | District | - Outcompete the indigenous spp, suppress growth of indigenous spp<br>- Loss of indigenous spp.<br>- Complete crop Failure<br>- suppress growth of pasture<br>- Promote pests infestation | District | - Cut and burn<br>-Sensitization on Invasive species management<br>- Promote use of invasive weeds for production of charcoal. | |
| | 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<br>- Formulate & enforce bye-laws/ordinance on bush burning. | |
| | 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 & enforce traffic rules | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Environmental component** | Land conflicts | - Human population<br>- Crops & livestock<br>- Infrastructure like houses | Village | -Loss of lives & property<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 and Vermin Officer<br>- Guard gardens<br>- Recruit & equip Vermin Control Staff<br>-Poison<br>-Set traps to kill some.<br>-Put scare crows in gardens.<br>-Hunt and kill<br>-Fence off water collection points from 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<br>- Food insecurity<br>- Poverty<br>- Diseases | Sub-county | -Sensitization on wetland conservation<br>-Sensitization on tree plating<br>-Setting & enforcing bi-laws/ordinances | |

**Table 4: Vulnerability Profile for Nakaseke 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 | 4 | 3 | 12 | Kinoni, Wakyato, Ngoma, Kinyogoga, Kasangombe |
| Droughts | 5 | 3 | 15 | Kinoni, Wakyato, Ngoma, Kinyogoga, Kasangombe, Butalangu TC, Kikamulo, Kito & Kapeeka |
| Soil erosion, | 5 | 3 | 15 | Nakaseke, Semuto, Kasagombe, Kapeeka, Ngoma & Kinyogoga. |
| Hail storms, lightning and strong winds | 3 | 3 | 9 | Nakaseke, Semuto, Kasagombe, Kapeeka, Ngoma Butalangu TC, Wakyato & Kinyogoga. |
| Bush fires | 5 | 4 | 20 | Ngoma, Butalangu TC, Wakyato Kapeeka, Kito Kinoni & Kinyogoga. |
| Crop pests and diseases | 4 | 4 | 16 | Nakaseke, Semuto, Kasagombe, Kito, Kikamulo, Kapeeka, Ngoma, Butalangu TC, Wakyato & Kinyogoga. |
| Livestock pests and diseases | 4 | 3 | 12 | Nakaseke, Semuto, Kasagombe, Kito, Kikamulo, Kapeeka, Ngoma, Butalangu TC, Wakyato & Kinyogoga. |
| Human Diseases outbreaks | 3 | 3 | 9 | Nakaseke, Semuto, Kasagombe, Kapeeka, Ngoma, Ngoma TC, Kapeeka, Butalangu TC, Wakyato & Kinyogoga. |
| Land conflicts | 3 | 2 | 6 | Wakyato, Ngoma, Kinyogoga, Kapeeka |
| Vermin and Wild-life animal attacks | 4 | 4 | 16 | Wakyato, Ngoma, Kinyogoga, Kinoni, Butalangu TC, Kikamulo |
| Earthquakes and faults | 2 | 2 | 4 | District wide |
| Road accidents | 3 | 2 | 6 | Kikamulo, Kiwoko TC, Wakyato, Butalangu TC. |
| Environmental degradation | 5 | 4 | 20 | Nakaseke, Semuto, Kasagombe, Kapeeka, Ngoma, Kinoni, Kito, Kikamulo, Wakyato & Kinyogoga. |
| Invasive species | 4 | 3 | 12 | Ngoma, Kinoni, Kikamulo, Wakyato & Kinyogoga. |

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 5: Hazard Risk Assessment**

| Hazard | Nakaseke | Kapeeka | Semuto | Kasangombe | Kikamulo | Wakyato | Kito | Ngoma | Kinoni | Kinyogoga | Nakaseke TC | Semuto TC | Kiwoko TC | Butalangu TC | Ngoma TC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Floods | | | | | | | | | | | | | | | |
| Drought | | | | | | | | | | | | | | | |
| Soil Erosion | | | | | | | | | | | | | | | |
| Strong winds, Hailstorms and Lightning | | | | | | | | | | | | | | | |
| Crop pests and Diseases | | | | | | | | | | | | | | | |
| Livestock pests and Diseases | | | | | | | | | | | | | | | |
| Human disease outbreaks | | | | | | | | | | | | | | | |
| Vermin and Wildlife animal attacks | | | | | | | | | | | | | | | |
| Land conflicts | | | | | | | | | | | | | | | |
| Bush fires | | | | | | | | | | | | | | | |
| Environmental degradation | | | | | | | | | | | | | | | |
| Earthquakes and faults | | | | | | | | | | | | | | | |
| Road accidents | | | | | | | | | | | | | | | |
| Invasive species | | | | | | | | | | | | | | | |

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 6: 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. Livestock keepers especially men are affected by drought since pastures and water dry out. |
| **Soil Erosion** | All age groups and gender are affected |
| **Hailstorms Lightning** | All gender and age groups<br>Children in schools are mostly affected |
| **Crop pests and Diseases** | All gender and age groups |
| **Livestock pests and Diseases** | All gender & age groups are equally affected since it affects family/household food & income security. |
| **Human disease outbreaks** | Malaria mostly women and children. HIV/AIDS affects all gender<br>Diarrhea and pneumonia in children |
| **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 7).

**Table 7: Coping strategies to the Multi-hazards in Nakaseke District**

| No | Multi-Hazards | Hazard | Coping strategies |
|---|---|---|---|
| 1 | Geomorphological or Geological | Erosion | • Use of Run-off control trenches & bands. Contour farming<br>• Plant trees to control water movement on<br>• Practicing Agro-forestry.<br>• Mulching in banana & coffee plantations<br>• Planting cover crops |
| 2 | | Earthquakes and faults | • No action, communities think the tremors are minor |
| 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 | | Drought | • Leave wetlands as water catchments<br>• Plant trees as climate modifiers<br>• Buy food elsewhere in case of shortage<br>• Buy water from the nearby areas<br>• Food Storage especially dry grains<br>• Construction of Dams and Valley tanks<br>• Adoption of climate smart agriculture<br>• Timely planting<br>• Planting drought resistant varieties<br>• Promoting rearing of drought resistant breeds of animals. |
| 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>• Installation of lightning conductors<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>• Rouging of affected crops<br>• Vigilance<br>• Sensitization of farmers<br>• Timely planting<br>• Plant resistant varieties<br>• Sensitization of farmers on Integrated Pest mgt |
| 7 | | Livestock pests and Diseases | • Spraying pests<br>• Vaccinations<br>• Burying animals that have died from infection<br>• Quarantine<br>• Sensitization of farmers |

| | | | |
|---|---|---|---|
| 8 | Ecological or Biological | Human epidemic Diseases | • Mass immunisation<br>• Visiting health centres<br>• Use of mosquito nets<br>• Routine sensitizations<br>• Effective treatment<br>• Promote sanitation & hygiene |
| 9 | | Vermin and Wild-life animal attacks | • Guarding the gardens & households<br>• Poisoning<br>• Hunt and kill<br>• Report to UWA and Vermin Officer<br>• Plant red pepper<br>• Dig trenches around gardens |
| 10 | | Invasive species | • Uproot<br>• Cut and burn<br>• Sensitization on Invasive species management<br>• Spray with herbicides<br>• Promote use of invasive weeds in production of charcoal briquettes |
| 11 | Human induced or technological | Land conflicts | • Community dialogues & sensitization on land laws<br>• Report to court<br>• Migration<br>• Enforcement of laws on land. |
| 12 | | Bush 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>• Popularise the use of fire beaters<br>• Set up by laws |
| 13 | | Road accidents | • Construction of humps<br>• Insert road Signage including speed limits<br>• Sensitisation<br>• Traffic law enforcement |
| 14 | | Environmental degradation | • Leave wetlands as water catchments<br>• Plant trees as climate modifiers<br>• Sensitization<br>• Law enforcement<br>• Formulate and enforce bye-laws/ordinances where necessary.<br>• Promote community based Natural Resource Management Planning |

## GENERAL CONCLUSION 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 Nakaseke 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 drought and flooding were identified as most serious problem in Nakaseke 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 Nakaseke District increase their vulnerability to hazard exposure necessitating urgent external support.

Hazards experienced in Nakaseke 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, counteracting 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, 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 laws, regulations and 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 operationalize 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. The Government through MAAIF and the District Production should promote drought and disease resistant crop varieties.

viii. The Government through OPM and Meteorology Authority should increase importation of lightning conductors and also reduce taxes on their importation.

ix. The Government through OPM and Meteorology Authority should support establishment of disaster early warning systems.

x. The Government through MWE increase funding and staff to monitor wetland degradation and non-genuine agro-inputs.

xi. The Government through OPM should improve communication between the Disaster Department and local communities.

xii. The Government through MWE should promote Tree planting along road reserves.

xiii. The Government through MAAIF should fund and recruit extension (facilitate them) works at Sub-county level.

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## APPENDIX I: DATA COLLECTION TOOLS

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

| | | | |
|---|---|---|---|
| Interviewer Team Name(s) | District: Nakaseke<br>Sub- county:<br>Parish:<br>Village: | GPS Coordinates | |
| | | X: | 416435 |
| | | Y: | 91453 |
| | | Altitude | 1093 |

| No. | Name of Participants | Designation | Contact | Signature |
|---|---|---|---|---|
| 1 | Sekagya Moses | Natural resources officer | 0782921909 | |
| 2 | Ssebbale Edrisa | DPMO | 0772315314 | |
| 3 | Wabwire R | AGNRO | 0772936243 | |
| 4 | Paude Gerald | ADNO/DNI | 0772932792 | |
| 5 | Galabuzi Paul | D/Planner | 0772489153 | |
| 6 | Edith Mutabazi | CAO | 0772490400 | |

**Introduction**

i. 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.

ii. 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.

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

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2. Which domestic animals are dominant in your area of jurisdiction?
3. What challenges are faced by farmers in your area of jurisdiction?
4. Have you experienced landslides and rock falls in the past 10 years in your area of jurisdiction?
5. Which Villages, Parishes or Sub-counties 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, Parishes or Sub-counties that have been most affected?
7. Which crops are majorly affected by landslides and rock falls in your area of jurisdiction?
8. In which way are the crops affected by landslides and rock falls?
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12. What are the relevant Government's interventions focusing at helping farmers mitigate the challenges mentioned?
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15. Which particular Villages, Parishes or Sub-counties have been majorly affected by earth quakes in your area of jurisdiction?
16. As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties 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 area of jurisdiction?
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 area of jurisdiction?

**22.** Which Villages, Parishes or Sub-counties have been most affected by floods?

**23.** As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties that have been most affected?

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

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

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

**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 area of jurisdiction?

**31.** Which Villages, Parishes or Sub-counties have been most affected by drought?

**32.** As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties that have been most affected?

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

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

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**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 area of jurisdiction?

**40.** Which Villages, Parishes or Sub-counties have been most affected by hailstorms or lightning?

**41.** As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties 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 area of jurisdiction?

**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 area of jurisdiction?

**47.** Which Villages, Parishes or Sub-counties 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, Parishes or Sub-counties that have been most affected?

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

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

**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 area of jurisdiction?

**55.** Which Villages, Parishes or Sub-counties 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, Parishes or Sub-counties that have been most affected?

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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 area of jurisdiction?

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

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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 area of jurisdiction?

69. Which particular Villages, Parishes or Sub-counties have been majorly affected by wildlife attacks in your area of jurisdiction?

70. As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties 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 area of jurisdiction?

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 area of jurisdiction?

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

77. Which Villages, Parishes or Sub-counties have been most affected by invasive species in your area of jurisdiction?

78. As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties that have been most affected?

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

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 area of jurisdiction?

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

**85.** Which Villages, Parishes or Sub-counties have been most affected by environmental degradation?

**86.** As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties 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?

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

**91.** Which particular Villages, Parishes or Sub-counties have been majorly affected by land conflicts in your area of jurisdiction?

**92.** As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties 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 area of jurisdiction?

**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 area of jurisdiction?

**98.** Which roads have experienced Road accidents?

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

**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 area of jurisdiction?

**104.** Which particular Villages, Parishes or Sub-counties have been majorly affected by bush and or forest fires in your area of jurisdiction?

**105.** As a way of ranking from Low, Medium, High and Very high, rank the Villages, Parishes or Sub-counties that have been most affected?

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## FOCUS GROUP DISCUSSION GUIDE FOR LOCAL COMMUNITIES

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

| No. | Name of Participants | Designation | Contact | Signature |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

### Introduction

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**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: | |
| Date: | Parish: | Y: | |
| | 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)** | | | | | | |

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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:**

United Nations Development Programme

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