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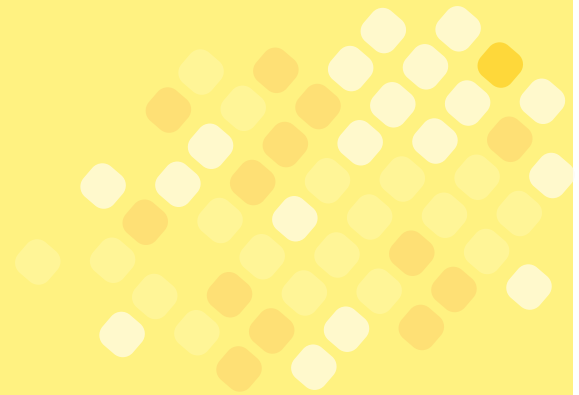
# **KARAMOJA**

# **KAABONG District**

## **HAZARD, RISK AND VULNERABILITY**

## **PROFILE**

**August 2014**





**With support from:**

United Nations Development Programme  
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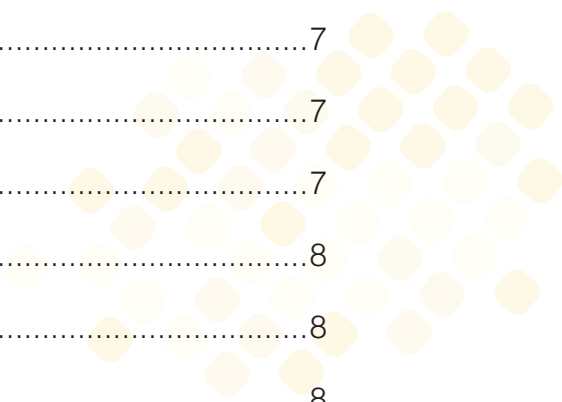


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## Acronyms

CBPP	Contagious bovine pleuro-pneumonia
CCPP	Contagious caprine pleuropneumonia
DDMC	District Disaster Management Committee
DRM	Disaster Risk Management
FMD	foot and mouth disease
GIS	Geographical Information System
GPS	Global Positioning System
NCD	Non-communicable Disease
OPM	Office of the Prime Minister
TC	Town Council
UBOS	Uganda Bureau of Statistics
UNDP	United Nations Development Programme



## Acknowledgement

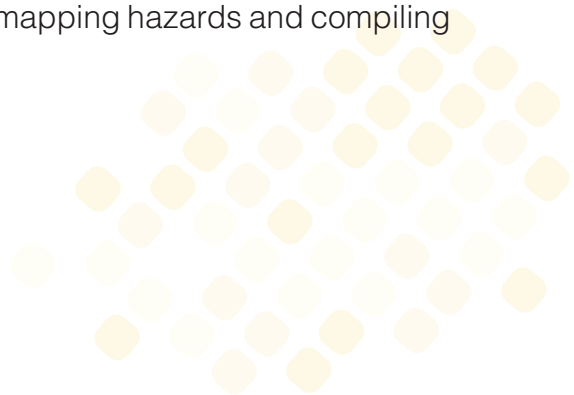
On behalf of the Office of the Prime Minister, I wish to express sincere gratitude to all of the key stakeholders who provided their valuable inputs and support to this hazard, risk and vulnerability mapping exercise that led to the production of comprehensive district hazard, risk and vulnerability profiles for the Karamoja sub-region.

I especially extend my appreciation to the Department of Disaster Preparedness and Management in the Office of the Prime Minister, under the leadership of the Acting Commissioner, Ms. Rose Nakabugo and the Assistant Commissioner, Mr. Gerald Menyha, for the oversight and management of the entire exercise. My appreciation also goes to the District Disaster Management Committees and the entire body of stakeholders who in one way or another yielded valuable ideas, resources and time to support the completion of this exercise.

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**Hon. Hilary O. Onek**

Minister for Relief, Disaster Preparedness and Management



# EXECUTIVE SUMMARY

This Kaabong District Hazard, Risk and Vulnerability Profile integrates scientific information provided by GoU agencies and hazard and vulnerability knowledge provided by communities on the district base map to contribute to a Ugandan atlas of disaster risk. It will support planning and decision-making processes to manage disaster risk in the District.

The methodology provided for four phases of work:

Phase I	Preliminary Activities
Phase II	Field Data Collection, mapping, verification and ground truthing
Phase III	Participatory data Analysis, Mapping and report writing
Phase IV	Refining and final map production/reporting

The report characterizes the district in terms of location, geography, gender demographics by sub-county and livelihoods.

It identifies endemic hazards in thirteen (13) classes, in order of high to low risk: Drought and food insecurity, floods, strong winds. Pest parasitic infestation, land conflicts, Vermin's\problem animals, animal diseases, wild\bush fires, land\rock slides, environmental degradation, human diseases, industrial accidents, cattle thefts, hail storm and lightning .

The discussion of the nature of each hazard and its geographic extent in terms of sub-counties provides a qualitative assessment of the situations that the communities face. Maps corresponding to each hazard show the areas where the hazard is significant, and also hotspots as points of incidence of the hazard.

Kaabong District is located between longitudes 33° 30' to 34° 31'N and latitudes 3° 45' to 3° 6'E in the extreme north-eastern corner of Uganda, bordered in the North and East by Republics of Southern Sudan and Kenya respectively. It also shares borders with the districts of Kitgum to the West, Moroto and Kotido Districts to the South.

The profile identifies drought, animal disease, environmental. Degradation, land conflict, cattle theft, floods, pest infestation, human disease, vermin, Problem animals, bushfire, hail storm, lightning, strong wind, landslide and industrial accidents as the predominate hazards in the district, in order of decreasing risk.

All of the sub-counties have significant vulnerability to disaster, accumulating risk from several hazards. Karenga, Kawalakol, Kapedo and Loyoro record the highest aggregate vulnerability levels compared to the other sub-counties in the district. Even the least vulnerable, Kaabong Town Council, has high risk of drought and medium risk of land conflict, human disease and severe winds. This aggregated vulnerability to several hazards at once compounds the exposure to disaster risk and the complexity of managing it.





# INTRODUCTION

The Kaabong District Local Government and the Department of Disaster Preparedness and Management in the Office of the Prime Minister (OPM), with the support of the United Nations Development Programme (UNDP), embarked on a process of mapping the hazards and analysing disaster risks and vulnerabilities in Kaabong district. The information contained in this District Hazard, Risk, and Vulnerability Profile will guide the adoption of disaster risk management (DRM) measures in the district and inform the development of the district contingency and development plans.

## Objectives

The objective of the hazard, risk, and vulnerability mapping is to produce a District Profile that will aid planning and decision making processes in addressing disaster threats/risks in Kaabong District.

## Methodology

The multi-hazard, risk and vulnerability mapping approach employed a people-centred, multi-sectoral, and multi-stakeholder approach. A mapping team led by the Office of the Prime Minister (OPM) and involving representatives from UNDP and district sector offices deployed on a field mission to Karamoja sub-region to capture the required information and produce the district profile.

The team employed a variety of data-collection methods including use of a mix-scale approach involving the integration of primary and secondary data. Secondary data were acquired through government sources (relevant ministries, departments and agencies, the districts in Karamoja sub-regions studied) and data bases from other organizations/NGOS operating in these districts. The raw spatial data and satellite images were assembled from relevant sources and analysed with descriptive statistics and remote sensing technology

The mapping exercise involved four critical phases as follows:

- Phase I Preliminary Activities
- Phase II Field Data Collection, mapping, verification and ground truthing
- Phase III Participatory data Analysis, Mapping and report writing
- Phase IV Refining and final map production/reporting

### Phase I: Preliminary Activities

In this phase the mapping team undertook a series of planning and programming activities before start of field activity including holding meetings with relevant teams, mobilizing required resources, acquiring required equipment and materials, review of relevant literature, establishing relevant contacts and developing a checklist of activities to be undertaken in Phase Two.



The main objectives of Phase One were to prepare and undertake preliminary assessment of the quality and nature of the resources/materials, develop a quick understanding within the mapping team and other actors of the task of the multi-hazard, risk, and vulnerability mapping before any detailed physical field work was undertaken. This phase enabled the scoping and design of specific content and legends for the thematic maps.

The phase was also useful for preparing the resource deployment plan, and outlining procedure and field work plans, etc. It articulated, among other issues, the utilization of various stakeholders to ensure maximum participation in locating disaster prone locations and any other information relevant to the mapping exercise.

## Phase II: Field Data Collection and Mapping

**Stakeholder mapping and local meetings.** A preliminary field meeting was held in each district to capture key local issues related to disaster incidence and trends. The meetings gave opportunities for the mapping team and stakeholders to identify other key resource persons and support staff from within the local community for consultation.

**Stakeholder Participation Practices.** Stakeholder participation was a key component of the mapping exercise. The team conducted consultations with district technical sector heads under the overall insight of the District Disaster Management Committee (DDMC) involved in the ground truthing exercises to ensure district leadership and ownership of the data and results. During exit meetings, stakeholders, particularly those at district level, were given the opportunity to validate, update and also contribute any other relevant information vital to the mapping process.

**Capture of spatial data.** Spatial data were captured and complemented by base maps prepared at appropriate scales. The base maps contained relevant data including location of existing social-infrastructure and services, district area boundaries, environmental elements, forest areas, utilities like roads, drainage and river course, contours and flood prone settlements.

**Secondary data or desktop research.** A desk review of relevant documents at the district and other umbrella organizations, including policy and legal documents, previous maps/report and studies, was conducted. A checklist summarized the required information according to the multi-disaster risk indicators being studied/mapped. Data from documents were analysed using various methods including content analysis.

**Critical observation and ground truthing.** This approach was used to critically assess the conditions, nature and location of disaster prone zones, current human activity and settlement patterns along disaster prone areas. Critical observation and ground truthing included inspection and observation of social infrastructure, major household economic activities being practiced, natural drainage lines, rivers etc. Non-mappable and non-physical situations were captured through remote sensing (e.g. satellite images) and physical observation.

**Main instruments of data collection.** The main instruments used for data collection were manuals of instructions (guides to mapping assistants), use of key informant guides and notebooks, high resolution GPS receivers, digital camera for taking critical photographs, high resolution satellite



images and base maps/topographic sheets of the mapping areas.

Exit/feedback meetings with stakeholders. After field activities and data collection, feedback and exit meetings with stakeholders were carried out in the district. These meetings provided additional information regarding the disaster mapping exercise, validated the data generated, and provided clarity on the expected outputs and the way forward into the next phase

Phase III: Data Analysis and Verification

**Analysis of collected data.** The mapping team and district government officials analyzed the collected data, and developed thematic disaster maps by integrating features generated from GPS data with base maps and high resolution satellite images. The main activities at this phase include:

- Data entry, cleaning and coding
- Preparation of base maps and process maps
- Preparation of disaster risk and vulnerability maps

**Methods used for data analysis.** Data analysis methods used are the following:

- Geo-processing, data transformation and geo-referencing
- Discussions/Focused Group Discussions
- Drafting, digitizing and GIS Overlays
- Compiling of different data and information

**Data editing, coding and cleaning.** Data entry clerks, data editors and coders digitized, edited, coded and cleaned data collected using the various tools mentioned above. Both qualitative and quantitative data obtained from the field were entered via a data entry interface customized to the layout of the field data forms. Data coding and analysis started immediately the data was available. Arrangements were made in the field to handle manual editing and coding as and when data was received from the field crew. Furthermore, data entry, verification, screen editing and system development followed sequentially to enable the preparation of draft maps.

**Data analysis package.** The mapping team analysed acquired data using MS Word and MS Excel for Windows, and spatial data using ArcGIS 10 software and mobile GIS applications. They performed rapid and systematic GIS overlays to generate base maps and risk and vulnerability maps.

**Descriptive statistics.** The mapping team investigated trends per given indicator using tables, graphs, charts and frequencies. As processing of data developed, they merged it for cross tabulation and eventual production of thematic maps for the various types of hazards.

**Generation and appraisal of draft Maps:** Prioritization set by the districts determined the various hazards presented on the thematic maps. The team convened a field workshop to present, appraise and validate the risk and vulnerability maps with respect to their accuracy and completeness. Information gaps were identified and filled in the final risk and vulnerability maps.



## Phase IV: Dissemination Workshop

A final workshop was conducted by the OPM to facilitate dissemination of the district hazard, risk, and vulnerability profile to relevant partners.

### **Overview of the District**

#### **Location**

Kaabong District is located in the extreme north-eastern corner of Uganda, in the north of the Karamoja Region, It is bordered in the north and east by Republics of South Sudan and Kenya respectively and by the districts of Kitgum to the west, Moroto and Kotido Districts to the south. The district is located between longitudes 33° 30' to 34° 31'N and latitudes 3° 45' to 3° 6'E.

The total land area of Kaabong District is 7,300km<sup>2</sup>. There is no significant water body in Kaabong. The district is 75km from Kotido by road, 195km from Moroto, approximately 200km from Kitgum and 612km from Kampala. The administrative centre of Kaabong District is in Kaabong Town Council.

#### **History**

Kaabong district local government was established in July 2005 and housed in buildings formerly of the Dodoth County headquarters. The district was first run by the interim District Council until after national elections when the new council took over in May, 2006.

#### **Terrain**

The stratum of Kaabong District comprises principally of the Pre-Cambrian system. Other groups of rocks from the Mesozoic and Cenozoic eras are associated with volcanic eruptions in the eastern parts of the region, producing mountains in Morungole. The altitude of Kaabong ranges between 100m to 2500m above sea level with the highest points found on the border with Sudan and Kenya. Most of Karamoja forms part of the plateau comprising a number of levels that represent several stages of transition of structures of the ancient basement rock.

#### **Soils**

Kaabong has three major types of soils, namely ferallitic, vertigos and ferruginous tropical soils. Less common types include litho sols. The genesis of soils in Kaabong district has been affected by many factors such as climate, elevation, type of parent rock, vegetation covers, topography, aggravation and erosion processes. The dominant ferruginous soils have been degenerated by weathering processes and have become less productive. Ferralitic soils also occur in small patches in Karenga Sub-County and are in more advanced stages, their productivity depending on favorable rainfall, adequate depth and maintenance of humid top soils which are unfortunately lacking in this area. Stony litho soils occur along the up-warped surface on the eastern side of the district. All the soils of Kaabong are of low to medium productivity with mono-cropping currently being practiced. Much of the soil has lost its fertility and sheet erosion due to torrential rains and strong winds has carried away top soil leaving the less fertile soil. The soil cover is also deteriorating with over-grazing, exposing it to agents of erosion.



## **Geology and hydro-geological conditions**

The basement complex characterized by mainly banded acid gneisses and undifferentiated-banded acid biotite magmatic gneisses underlie Kaabong district. These highly metamorphic rocks form north-south trending low-lying wide ridges. The trend of the ridges indicates the axial trend of folding which controls most of the drainage system. The drainage system which is almost east-west tends to be straight since jointing controls it. The regolith is rather thin in many parts of the district.

### **Ground Water Occurrence.**

In this geological environment, ground water occurrence in the regolith and fractured rocks may have good trans-emissivity and storage ability to provide good yield. This is especially important where the weathered rocks are thick and coarse grained in nature. Traditionally, boreholes have been drilled into the bedrock to tap the fractured aquifers so that storage is provided by the overburden or in the fractured upper part of the bedrock and is generally dependent on the size of the catchment and lithological characteristics of the overburden.

### **Ground Water Potential.**

The presence of boreholes in this area is an indication of groundwater potential. The borehole data obtained from the records indicate the yield ranging from 0.4 to 5m<sup>3</sup>/h, which may be classified as low to medium groundwater potential. The yields of the boreholes within the basement rocks depend on the number of saturated fractures intersected during drilling.

### **Climate and Rainfall.**

Kaabong has a dry savannah semi-arid climate characterized by an intense hot season lasting from November to March each year, with whirlwinds and dust storms. The rainy season is usually from April to August and provides about 519mm per annum on average, which is spatially and temporarily distributed unevenly, depending on local factors.

There are marked minimum in June and marked maximum peaks in May and July. The rain is erratic but distinct wet and dry seasons are a prominent feature; the most important form of precipitation is rain. Dewfall does not occur frequently and hence is unreliable. Precipitation has a big impact on plant growth and available data shows inadequate and unreliable amounts, and uneven distribution, which has significant influence on the economy and life of the district. There is one long dry season from October to February with dry spells in June to August. The daily temperatures range from 20°C to 32°C degrees; relative humidity can reach 60% between June and July.

### **Sun and wind**

Between December and April of each year, the north-easterly winds are usually strong. This is a time of dust storms, desiccation and pulverization of the sparse vegetation cover. It normally diminishes between May and October, which form part of the wet season. The district has enormous untapped solar and wind resources, which are regarded as dangerous hazards rather than sources of energy to be exploited. Evapotranspiration is high as expected with high temperatures and constant dry winds.



## Vegetation

The vegetation pattern is typically semi-arid with dry tree savannah species dominating grass species. The main vegetation communities in the district include forests at high altitudes (dry montane forests), savannah woodland, semi evergreen thicket around Karenga, deciduous thickets, riparian communities, grass steppes. Forests are found on localized patches of hills and mountains such as Mt Morungole, Zulia and Timu. The natural forests have cassia siamea and eucalyptus. The forest and woodland account for 2,324 km<sup>2</sup> (18%). Of this, 213,726ha are for central government and local forest reserves comprise 41 ha, together about 16.7% of the national total forest cover.

## Mineral Resources.

A number of minerals is said to exist in Kaabong District and these include reef and alluvial gold, magnetized mica and iron. The main problem with the resource is lack of exploitation and lack of information on the quantity and quality of the minerals but it is hoped that once exploitation of these minerals commences the district will benefit in various ways an expanded tax base, employment opportunities and improved infrastructure. Mining in Karamoja and particularly Kaabong has been at subsistence level except where Branch Energy, a South African based mining company has a concession. They have not shared information about findings from the gold exploration in Lopedo Gold mines. There are no industries due to basically lack of electricity.

## Cultural and ethnic issues

The Dodoth ethnic groups largely inhabit Kaabong district. They constitute about 95% of the total population. The remaining 5% in Kaabong constitutes other native minority groups like the Napore, Nyangea, Mening and Ik; there are also people from other tribes within Uganda who have settled in the District.

The Dodoth are committed to their culture which embodies, among others, total respect for the seniority based on age status and wealth. The elders have a lot of influence on the community's involvement in daily running of the affairs of the community in the manyattas.

The manyattas are a vital point of intervention for needs identification, project planning participation, implementation, operation and maintenance during the planning process. The social set up of the people has changed tremendously mainly due to illegal acquisition of modern powerful weapons in the effort to counteract those of other pastoral rivalry groups in the neighbouring countries. The power of the illegal gun ownership has eroded the once envied and respected Dodoth cultures of social control, discipline and respect for human life. It has promoted and accelerated the culture of massive livestock rustling, lawlessness and wanton destruction of the environment.

## Population and Demographics.

The district has a population of 369,700, 1.2% of the total Ugandan population, with a ratio of 1:03 males to females. Only 6.5% of the total population lives in urban areas. About 90% of arable land is owned according to traditional laws and no land is held by freehold and leasehold. The district has 52,814 households each with an average of seven persons; the average land area for agriculture is



0.14 acres per household. Per capita land holding is 11.5ha and land is critically over-utilized near homesteads with an average of 5-6 plots on the different flat locations around the villages. Each plot measures between 0.1 to 2.0 acres.

**Table 1 Summary of Kaabong District population by sub-county by gender**

Sub county	Males	Females	Totals 2010/11	Males	Females	Totals 2011-12
Lodiko	8,000	9,200	17,200	8,600	9,800	18,400
Kaabong TC	1,900	10,400	22,300	12,800	11,100	23,900
Kalapata	22,600	25,100	47,700	24,300	26,700	51,000
Kapedo	11,200	10,700	21,900	12,200	11,400	23,600
Karenga	12,200	9,800	22,000	13,200	10,400	23,600
Kathile	19,400	19,600	39,000	20,900	20,800	41,700
Loyoro	5,000	5,200	10,200	5,300	5,600	10,900
Sidok	15,200	14,100	29,300	16,300	15,100	31,400
Lolelia	12,700	13,200	25,900	13,600	14,000	27,600
Kaabong East	18,100	19,500	37,600	19,500	20,800	40,300
Kaabong West	13,600	14,600	28,200	14,700	15,500	30,200
Kamion	6,100	3,400	9,500	6,600	3,600	10,200
Lobalangit	8,300	6,700	15,000	8,900	7,200	16,100
Kawalakol	10,000	9,500	19,500	10,700	10,100	20,800
Totals	174,300	71,000	345,300	187,600	182,100	369,700

**Source:** UBOS, December, 2008

**Table 2 Major tribes and languages spoken in Kaabong District**

Tribe	Sub-Counties	Language spoken
Dodoth	Kapedo, Kathile, Lolelia, Kalapata, Kamion, Kaabong West, Kaabong East, Lodiko, Loyoro, Sidok, Kaabong TC	Ngakarimojong - Dooso
Napore	Karenga, Lobalangit, Kapedo and Kawalakol	Ngakarimojong - Porein
Nyangiya	Lobalangit, Karenga, Kapedo and Kawalakol	Ngakarimojong - Nyangiya
Mening	Karenga, Kawalakol and Kapedo	Ngamening and Ngakarimojong - Porein
Teuso/IK	Kamion and Kalapata	Ik/Ngateuso and Ngakarimojong - Dooso



## Livelihoods

**Table 3 Kaabong District main livelihoods, by sub-county and town council**

Zones	Sub County	Livelihoods
Wet	Lobalangit Karenga Kapedo Kawalakol	crop farming (maize, sorghum, beans, simsim, cassava and groundnuts) sale of general merchandise (petty trade) sale of local brew (kwete) livestock rearing (cows, goats, sheep) pigs poultry (chicken, turkeys) sale of firewood hire of labour bee keeping /honey stone quarrying brick making
Moderately wet	Kathile Kamion Lolelia	crop farming (sorghum, beans, maize, bulrush millet) sale of general merchandise (petty trade) livestock keeping (cows, goats, sheep) chicken sale of firewood sale of local brew (kwete) bee keeping stone quarrying brick making
Dry Belt	Kaabong TC Loyoro Lodiko Sidok Kaabong West Kaabong East Kalapata	livestock (cows, goats, sheep and donkeys) crop farming (sorghum, bullrush millet, beans) petty trade sale of firewood sale of charcoal hire of labour poultry (chicken) piggery stone quarrying brick making

## Women's livelihoods

The Karimojong community is a largely patrilineal community. Almost all authority is traditionally vested in the man as the head of the household. He controls the productive resources and also 'owns' his wife or wives once dowry has been paid for her. However, women play a greater role as income earners for the family. They participate mostly in the sale of charcoal, local brew (kwete), rearing of chickens, stone quarrying, and sale of firewood, casual labour, farming and petty trade.

A woman is responsible for non-monetized activities such as collecting cooking fuel, child and elder care, fetching water, gardening, building temporary housing and household food preparation, leaving almost no time to pursue anything of interest to her as an individual. Meanwhile the man, as the head of the household, owns almost all the factors of production and takes nearly all the important decisions in the household, with ample leisure time to socialize and pursue personal interests.





# HAZARDS

**Table 4 Hazard status**

Hazard	Status	Sub County	Rank
Drought	Instances are characterized by nine months of drought with isolated showers.	All the sub counties	1
Animal disease	Instances of animal epizootics like NCD, African swine fever, CCPP, CBPP, goat, avian flu and FMD plagues and trypanosomiasis are reported. Animal diseases have claimed lives of many and other live-stock within the area. The last instance was recorded in 2013 in Kaabong Town Council.	Kaabong TC Lodiko Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Kaabong East Kalapata Loyoro Sidok Kathile	2
Crop disease	Instances of crop diseases are characterised by low yields and poor harvests, food shortage and migration of people in search of food. The common crop diseases are sorghum bores and honeydew, especially during the wet season.	Lodiko Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Kaabong East Kalapata Loyoro Sidok Kathile Kamion	



Hazard	Status	Sub County	Rank
Floods	Floods are severe during the wet season. Bridge and road submersions are common.	Kaabong TC Lodiko Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Kalapata Loyoro Sidok Kathile Kamion	3
Environmental degradation	Environmental degradation occurs mainly from charcoal burning, brick making, construction, etc.	Lodiko Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Kaabong East Kalapata Loyoro Sidok Kathile	4
Bushfire	Bushfires are reported to have led to the destruction of homes, grain stores, garden crops, vegetation cover and wildlife habitat. Instances begin at the onset of, and continue through, the dry season.	Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Kalapata Loyoro Sidok Kathile Kamion	5



Hazard	Status	Sub County	Rank
Human disease	Instances of human diseases reported E.g.; HEPE, Jiggers, HIV/Aids	Kaabong TC Lodiko Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Kalapata Loyoro Sidok	6
Land conflict	Instances of conflict reported; E.g; boundary conflicts between the Kotido and Kaabong and Kitgum for grazing land in the animal corridors	Kaabong TC Lodiko Lobalangit Karenga Kawalakol Lolelia Kapedo Kaabong West Sidok Loyoro	7
Hailstorms and lightning	Instances of lightning reported in the district.	Lobalangit Kawalakol Lolelia Kapedo Kaabong West	8
cattle theft	Cattle theft instances reported.	Lodiko Lolelia Kaabong East Kalapata Loyoro Sidok Kathile Kamion	9
Landslides	Instances reported.	Lobalangit Kawalakol Lolelia Kapedo Loyoro Kamion	10



Hazard	Status	Sub County	Rank
Vermin and problem animal	Reported incidents include monkeys, baboons, wild pigs and cane rats which attack gardens during the flowering and harvesting season. Problem animals are elephants and buffalos, mostly in sub-counties adjacent to the National Park.	Kerenga Kapedo Kamion Sidok Karenga Kapedo	11
Strong winds	Instances of strong winds reported.	Kaabong Town Council Lodiko	12
Industrial accidents	Instance of gold mining and associated risk reported.	Lodiko	13

**Table 5 Hazard summary**

Sub County	Floods	Land Conflicts	Drought	Human Diseases	Crop and Animal Diseases	Strong Winds	Bushfires	Cattle theft	Pest infestation	Environmental Degradation	Landslides	Hail storms and lightning	Vermin, problem animals	Industrial accidents	Total
Kawalakol	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
Lolelia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
Kapedo	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
Lodiko	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Lobalangit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Karenga	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Sidok	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Kaabong West	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Loyoro	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Kalapata	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
Kathile	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
Kamion	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7
Kaabong TC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
Kaabong East	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5
Totals	13	9	14	11	13	2	11	8	13	11	6	5	5	1	122



**Table 6 Hazard risk Assessment**

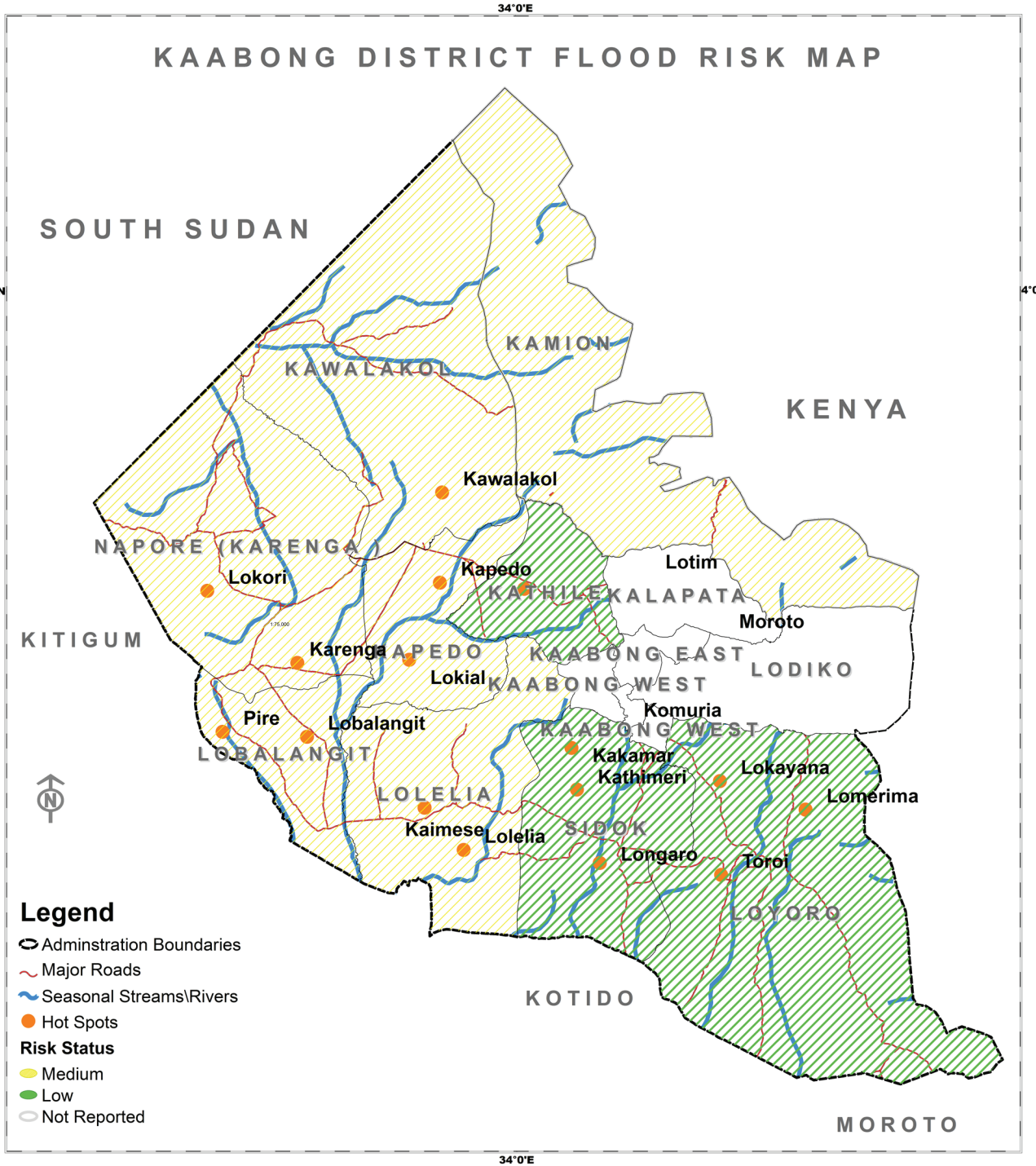
Hazard	Kaabong TC	Lodiko	Lobalangit	Karenga	Kawalakol	Lolelia	Kapedo	Kaabong West	Kaaabong East	Kalapata	Loyoro	Sidok	Kathile	Kamion
Floods	L	L	M	M	M	M	M	L		M	M	L	M	
Land conflict	M	L	M	H	M	M	M	L	L	L	L	M	L	L
Drought	H	H	L	L	M	M	M	H	H	M	M	M	M	M
Human disease	M	L	L	M	M	L	M	L	L	L	L	L	L	L
Animal disease	L	M	M	M	M	M	M	M	M	M	M	M	M	L
Strong wind	M	M	L	L	L	L	L	L	L	L	L	L	L	
Cattle theft		M	L	L	L	M	L	L	M	H	H	M	M	L
Pest infestation		L	M	M	M	M	M	L	L	L	L	L	L	M
Environmental degradation		H	L	L	L	L	M	H	H	L	H	M	H	L
Landslide			M	L	H	L	L				L		L	M
Hail storm, lightning	L	L	L	L	M	M	M	L	L	L	L	L	L	L
Vermin			M	H	H	M	H				L	L	L	M
Industrial accidents		M								L	L	L	L	L
Bushfire			M	M	L	L	M	L		L	M	M	M	M

Risk: H = high, M = medium, L = low, blank = no risk reported



# RISKS

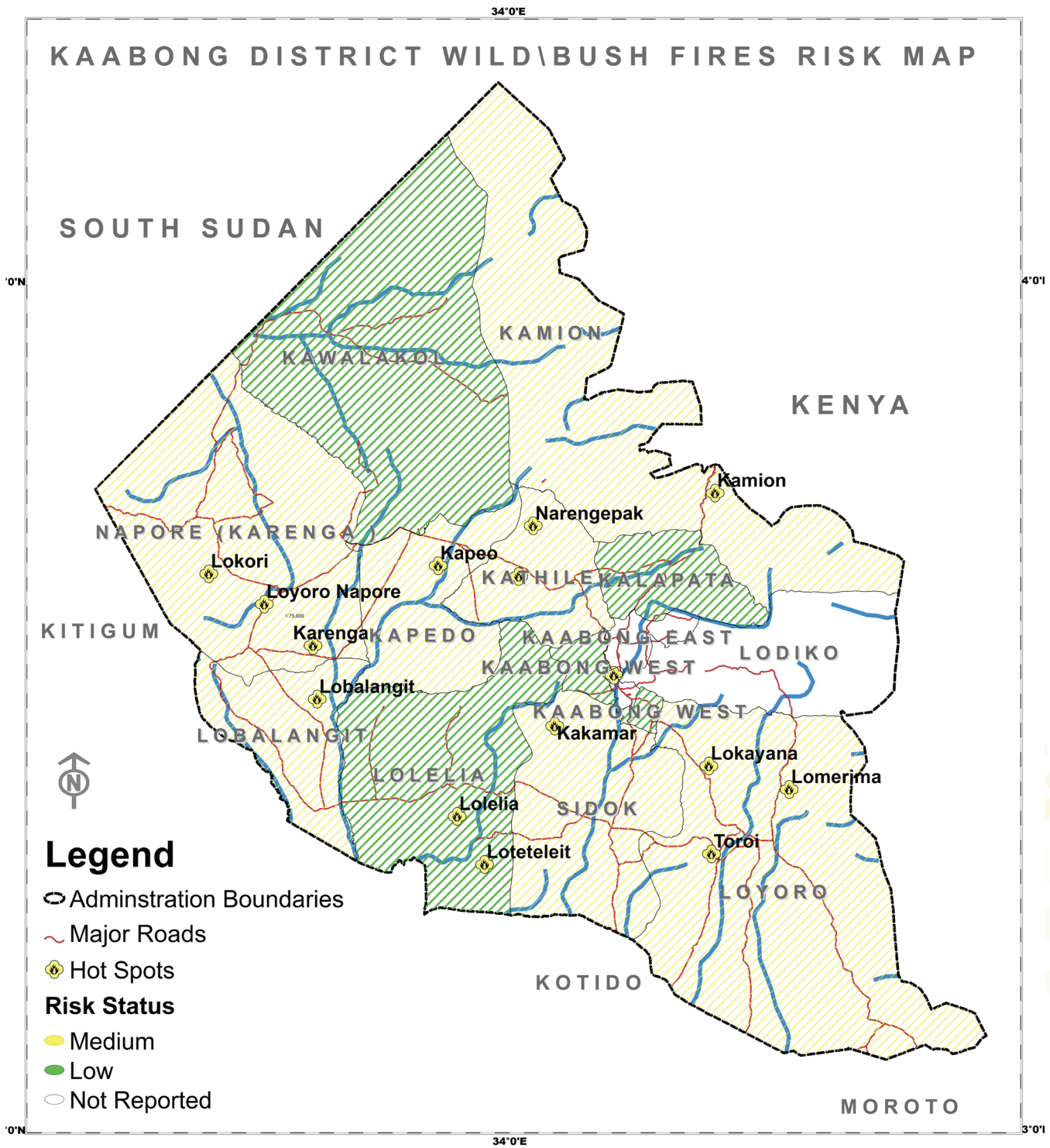
## Flood risk



**Figure 1 Flood risk**

Flooding is moderately ranked in the district with some sub-counties not reporting significant floods. Floods are reported in Loyoro, Sidok, Lolelia, Lobalangit, Kawalakol, Kathile, Kalapata, and Kapedo among others. Flood are most severe during the rainy season due to silting of the many streams, and destroy crops in the sub-counties of Karenga, Kapedo, Lobalangit and Kawalakol, especially those along the foothills. The worst incidents were recorded in the years 2010/2011 and 2011/2012.

## Bushfire risk

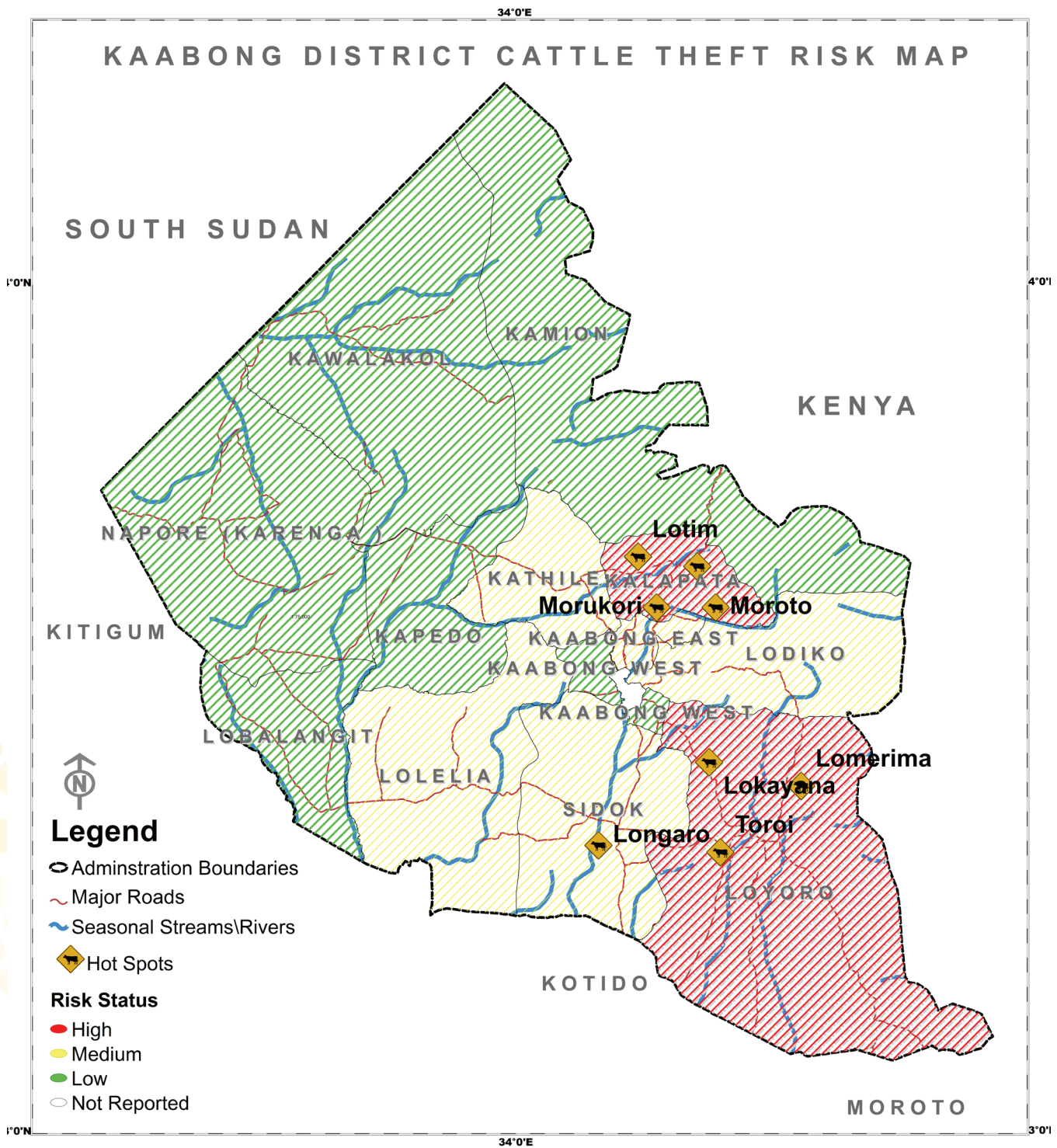


**Figure 2 Bushfire risk**

Bushfires are increasingly common from 2011, mostly affecting the sub-counties of Karenga, Lobalangit, Loyoro, Kathile, Lolelia, Kapedo, Kamion and Kaabong west. They occur at the onset of the dry season and destroy garden crops just before harvesting. Manyattas are vulnerable, being fenced with dry wood, so homesteads are destroyed. Bushfires are mainly caused by poachers, honey harvesters, fruit and vegetable gathers, smokers, farmers and cattle keepers.



## Cattle Theft Risk



**Figure 3 Cattle theft risk**

Cattle theft exists between the Jie and the Dodoth ethnic communities. The situation is complicated by the neighbouring countries of Kenya and south Sudan who have not disarmed and shelter armed Ugandans who launch cattle raids from outside of the control of Ugandan authorities. These are unpredictable and sporadic events which lead to loss of livestock, strained relationship and sometimes loss of life. Loyoro (Toroi, Lomerima and Lokayana risk hot spots parishes) and Kalapata (Moroto, Lotin and Morukori risk hot spots parishes) are high-risk sub-counties. The other sub counties record either low or medium risk levels.



## Drought Risk

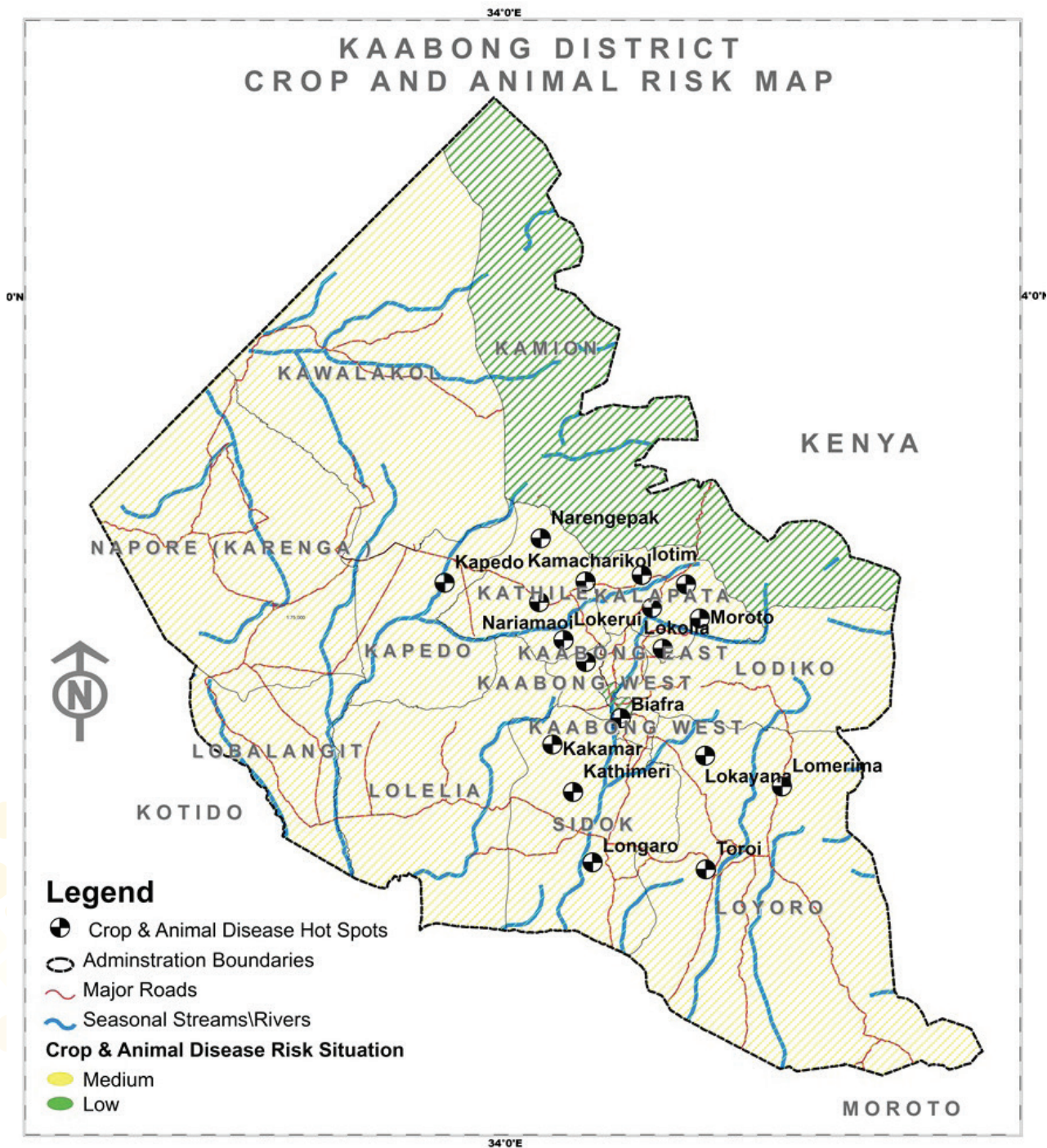


**Figure 4 Drought risk**

Drought and food insecurity are widespread throughout the district mainly caused by dry seasons prolonged from four to nine months, resulting in loss of livestock, human deaths, increased rural-urban migration, family breakdown, migration to neighbouring districts, early marriages of children between 12-18 years in exchange for food, and women and elderly exchanging labour for food and basic needs. The highest risk situation is in Lodiko and the lowest is in agro-pastoralism communities of Karenga and Labalangit.



## Crop and Animal Disease Risk

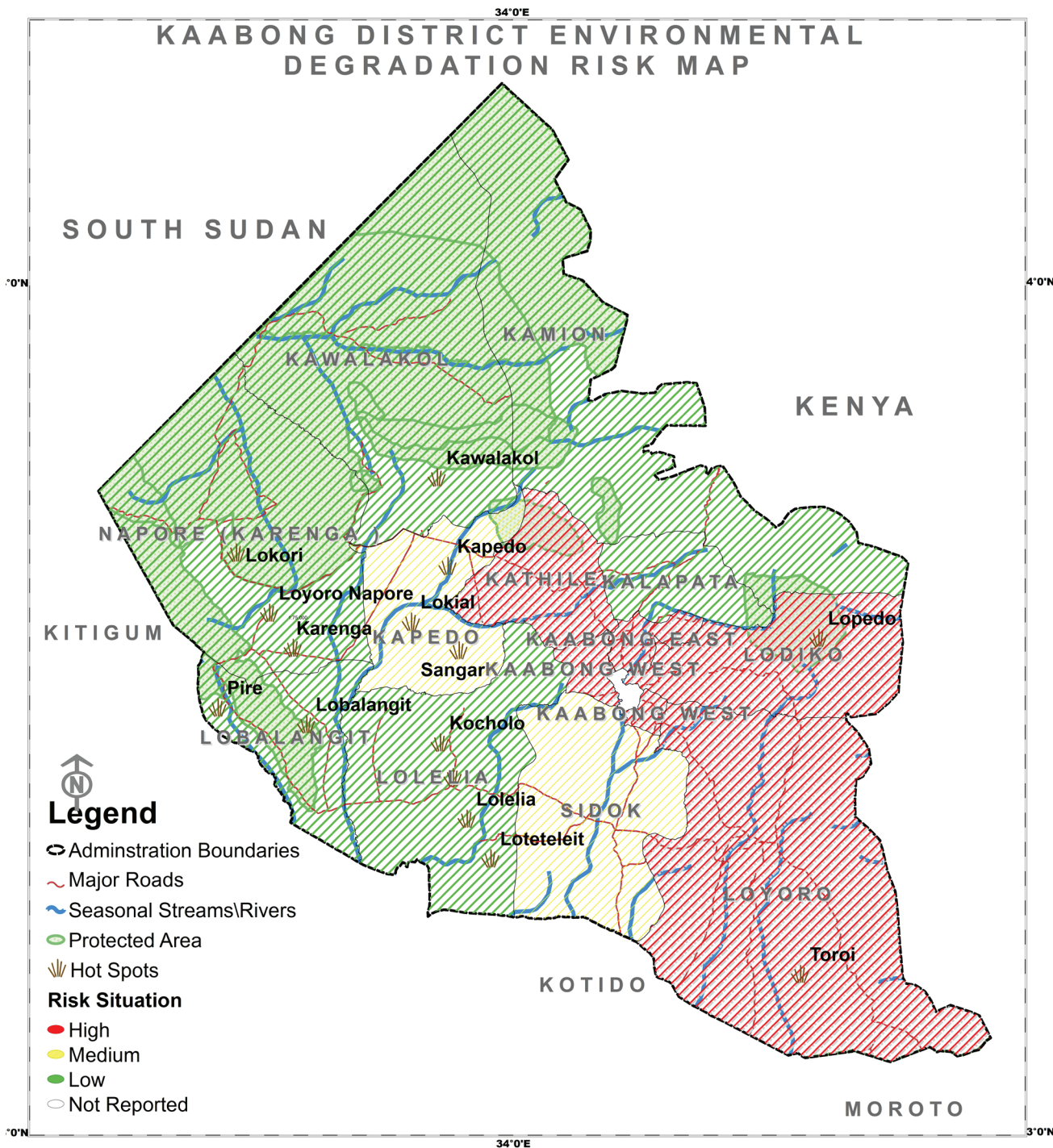


**Figure 5 Crop and animal disease risk**

In the period 1979-1981, rinderpest (known locally as loleo) affected a large number of livestock in the district resulting in significant loss of animals. In the year 2011-2012, swine fever hit Kaabong district and killed all the pigs. Animal epizootics such as NCD, African swine fever, Nagana, CCPP, CBPP, avian flu, FMD plagues and trypanosomiasis are also reported to affect goats, cattle and sheep throughout the district.

Crop diseases greatly affect the yields and intensify food insecurity. They occur mainly during the rainy season when farmers have already planted. The most common diseases are sorghum bores and honeydew which can affect the entire plantation, leading to poor harvest, food shortage and malnutrition.

## Environmental Degradation Risk



**Figure 6 Environmental degradation risk**

Currently, serious ecological degradation in the district is apparent in sheet erosion, deforestation, vegetation burning, gully development and flash floods in the sub-counties of Karenga, Kapedo and Kawalakol. Wildlife are increasingly rare and shrinking in range. Erosion impacts include loss of life due to rockslides and mudslides in the sub-counties of Kawalakol, Lolelia and Lobalangit.

For decades the forests have been sources of fuel and building materials and cutting them has provided permanent farming and grazing lands. These uses have threatened the sustainability of the vegetation cover. High risk levels are reported in Loyoro (Toroi risk hot spot), Lokido (Lopedo risk hot spot), Kathile, Kaabong east and west and Kalapata.



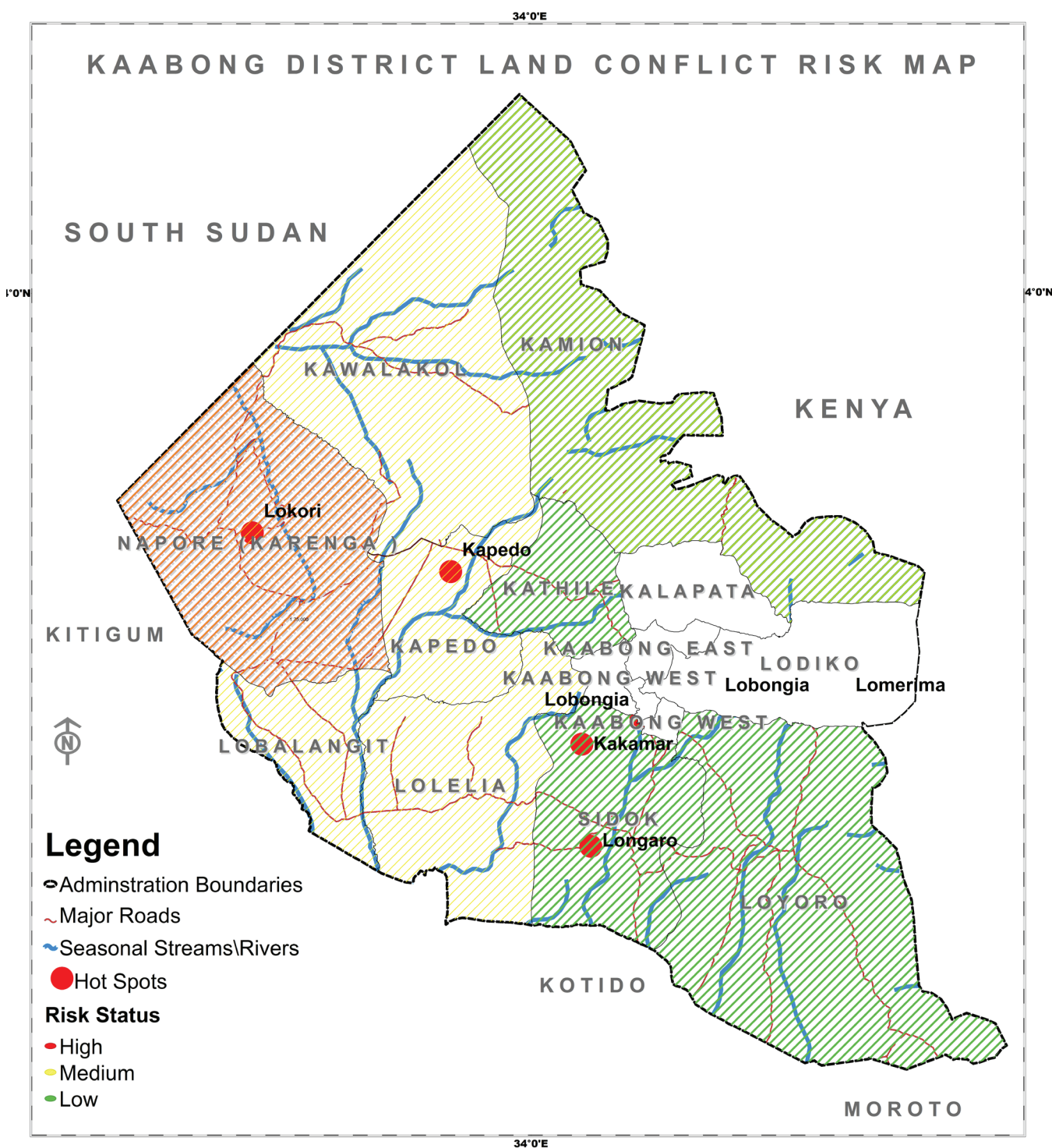
## Human Disease Risk



**Figure 7 Human Disease Risk**

During 1971-1972, cholera hit the whole of Karamoja, including Kaabong. In 1979-1981, cholera returned to Dodoth, affecting a significant number of people. In 1992-1993 an outbreak of meningitis caused some deaths. In August 2008, hepatitis E broke out in the district affecting almost all sub-counties. Currently there is an outbreak of jiggers in almost all the sub-counties of Kaabong District. Most of these diseases come as a result of poor hygiene and sanitation practices, and lack of safe clean drinking water, leading to disability, loss of life and low productivity.

## Land Conflict Risk

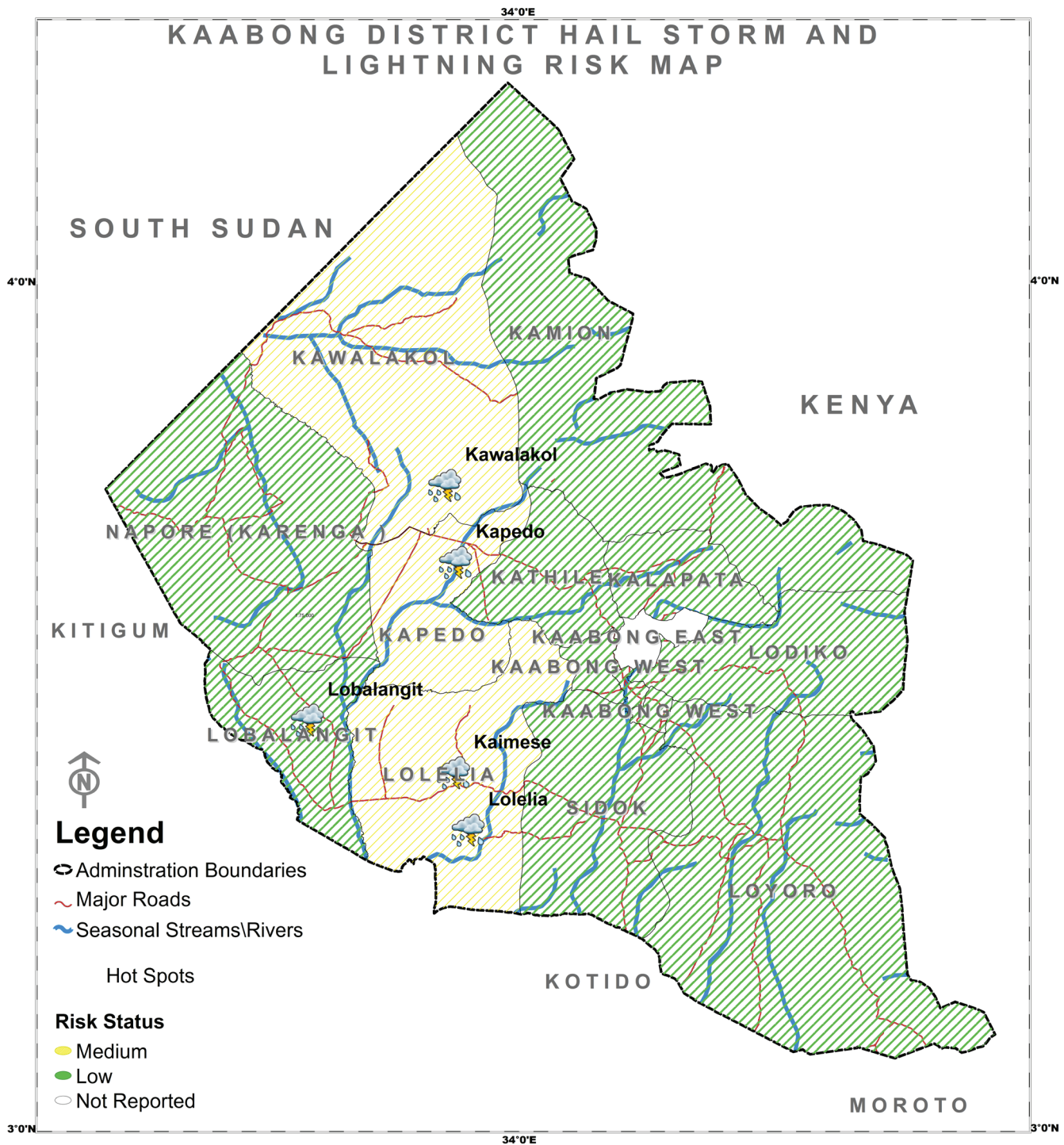


**Figure 8 Land conflict risk**

Encroachments into protected areas are a sources of conflict between officials of Uganda Wildlife Authority and the Dodoth people in the sub-counties of Sidok, Karenga, Lobalangit, Kawalakol and Lolelia. Communities also have land disputes with other government institutions over unsurveyed government land. Cross-border land conflicts occur between the districts of Kitgum and Kaabong, Kotido and Kaabong. High risk levels are reported in Napore (Karenga) Sub-County. The rest of the sub-counties experience moderate and low land conflict risk levels.



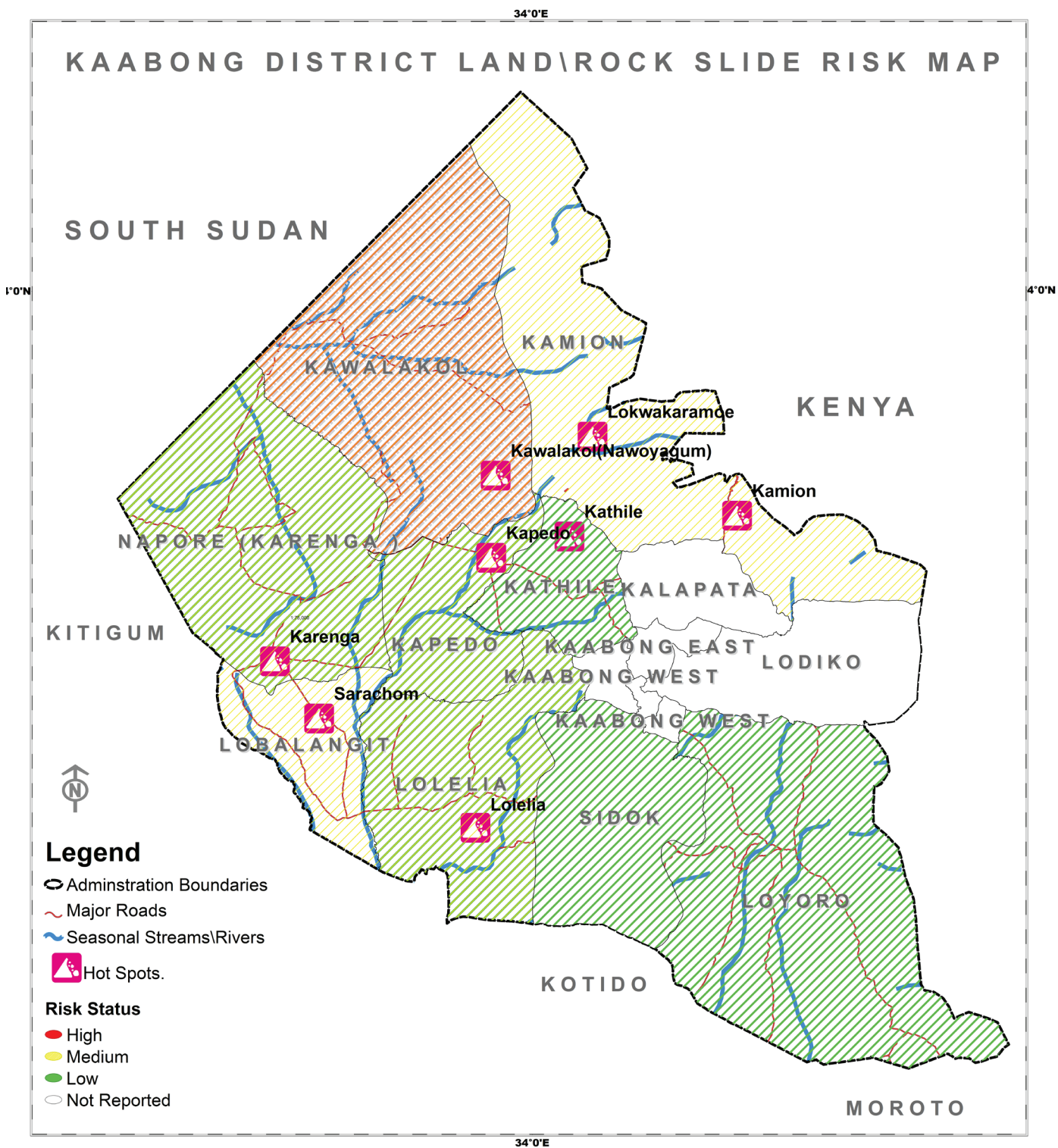
## Hailstorm and Lightning Risk



**Figure 9 Hailstorm and lightning risk**

Kaabong district, typical of the Karamoja sub-region, experiences heavy rains especially during the wet seasons, sometimes accompanied by severe storms and lightning which devastate property, farmlands and human life. Risk hot spots are recorded in Lolelia (Lolelia, Kaimese), Kawalakol, Kapedo and Lobalangit.

## Landslide Risk



**Figure 10 Landslide Risk**

Landslides occur during heavy rains in the sub-counties of Lobalangit, Kawalakol, Kamion, Kapedo and Lolelia, which are located in the mountains and on hill slopes. In saturated soils unstable boulders roll down, sometimes resulting in deaths, destroyed homesteads and damaged gardens. Kawalakol records the highest risk levels in the district.



## Vermin Risk

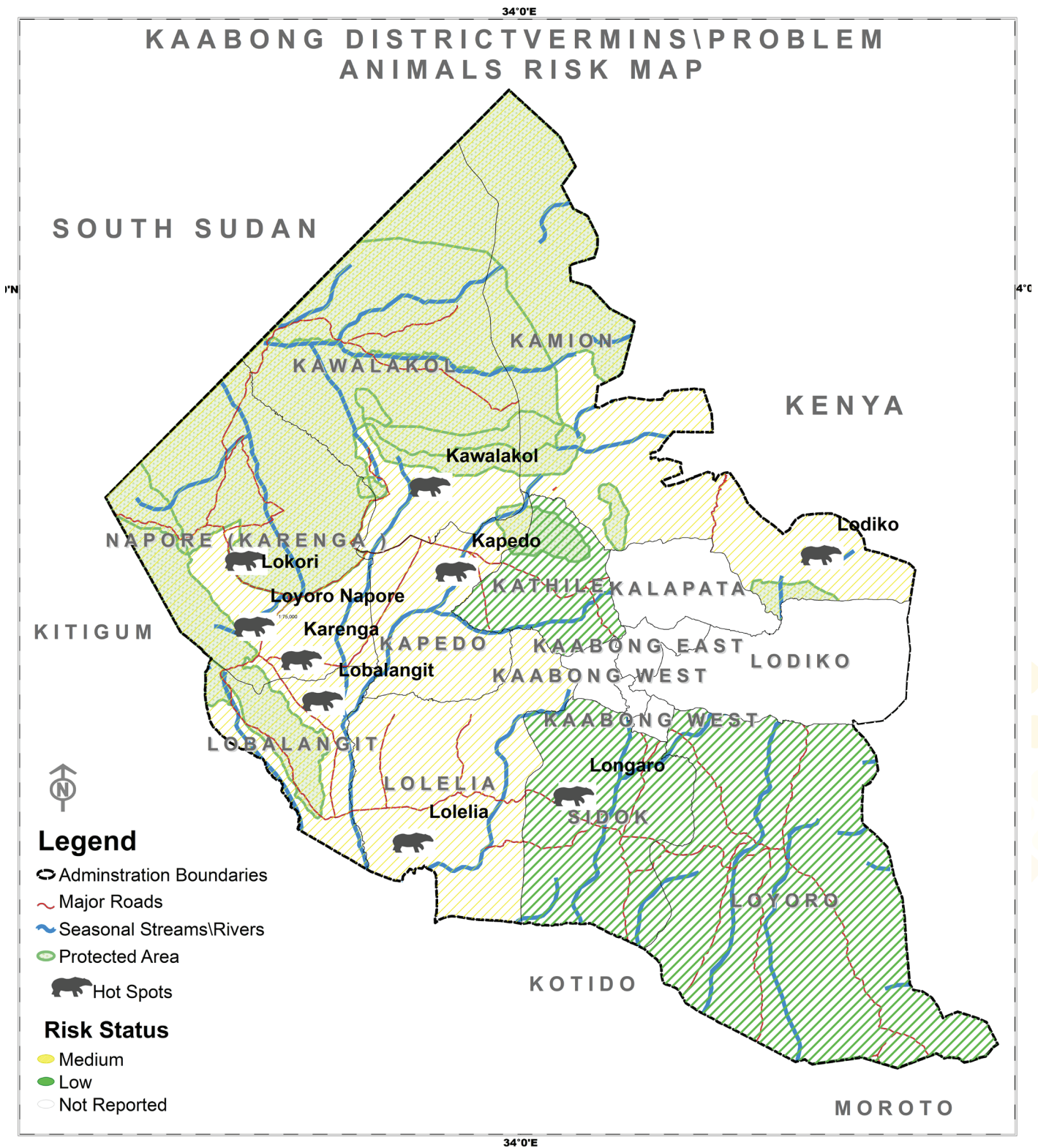


**Figure 11 Vermin risk**

Baboons, monkeys, wild pigs and cane rats feed on crops during the flowering and harvesting season. They are common in the sub counties adjacent to the National Park and include Karenga, Kapedo, Lotalangit, Kamion and Kawalokol.



**Problem animal risk**

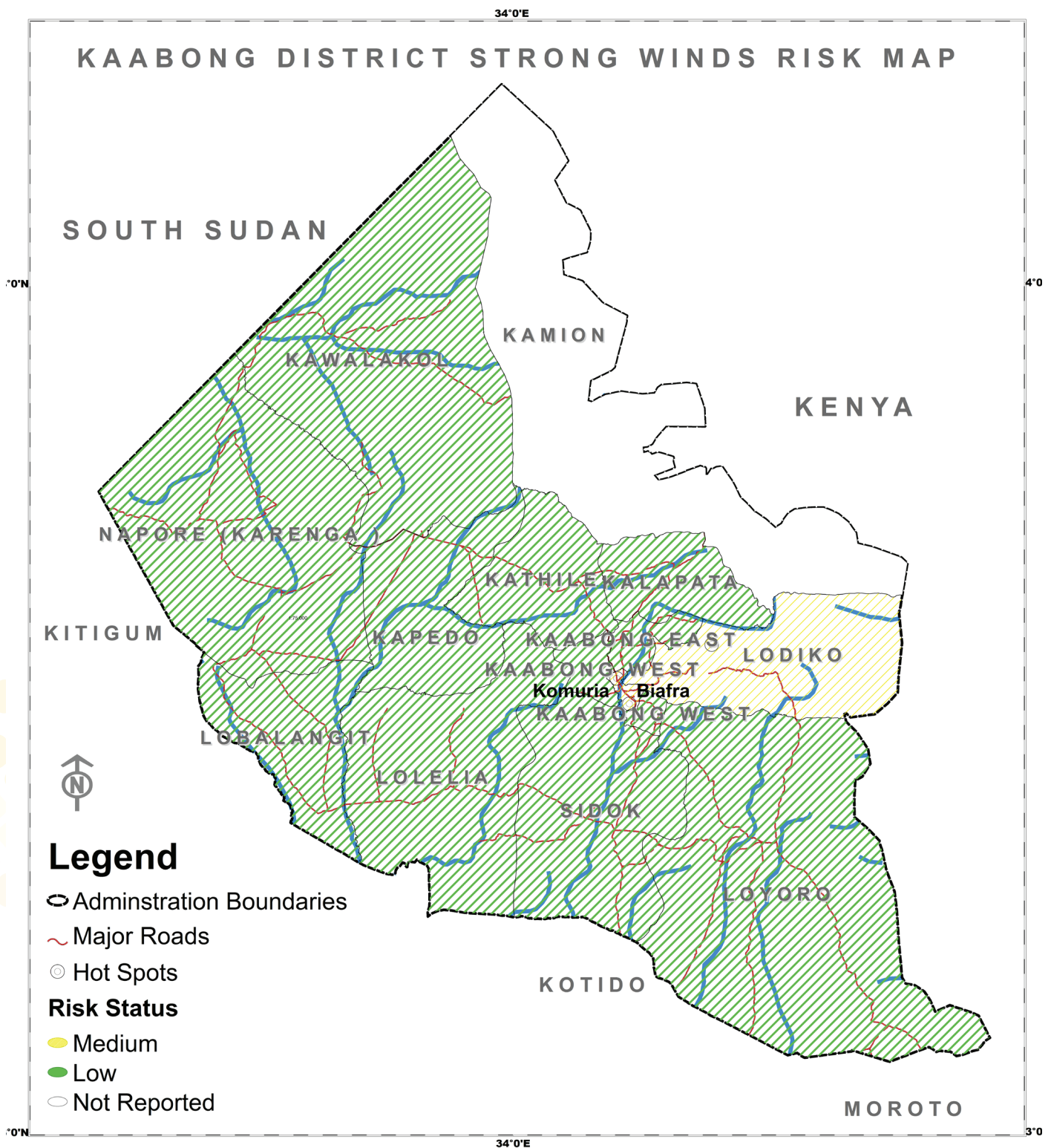


**Figure 12 Problem animal risk**

Buffalos and elephants which trample and feed on crops during the flowering and harvesting season are common threats in the sub-counties adjacent to the National Park: Karenga, Kapedo, Lobalangit and Kawalakol. Crop destruction by problem animals is linked to food insecurity, strained relationships with the park management and danger to the lives of the wild animals.



## Strong wind risk

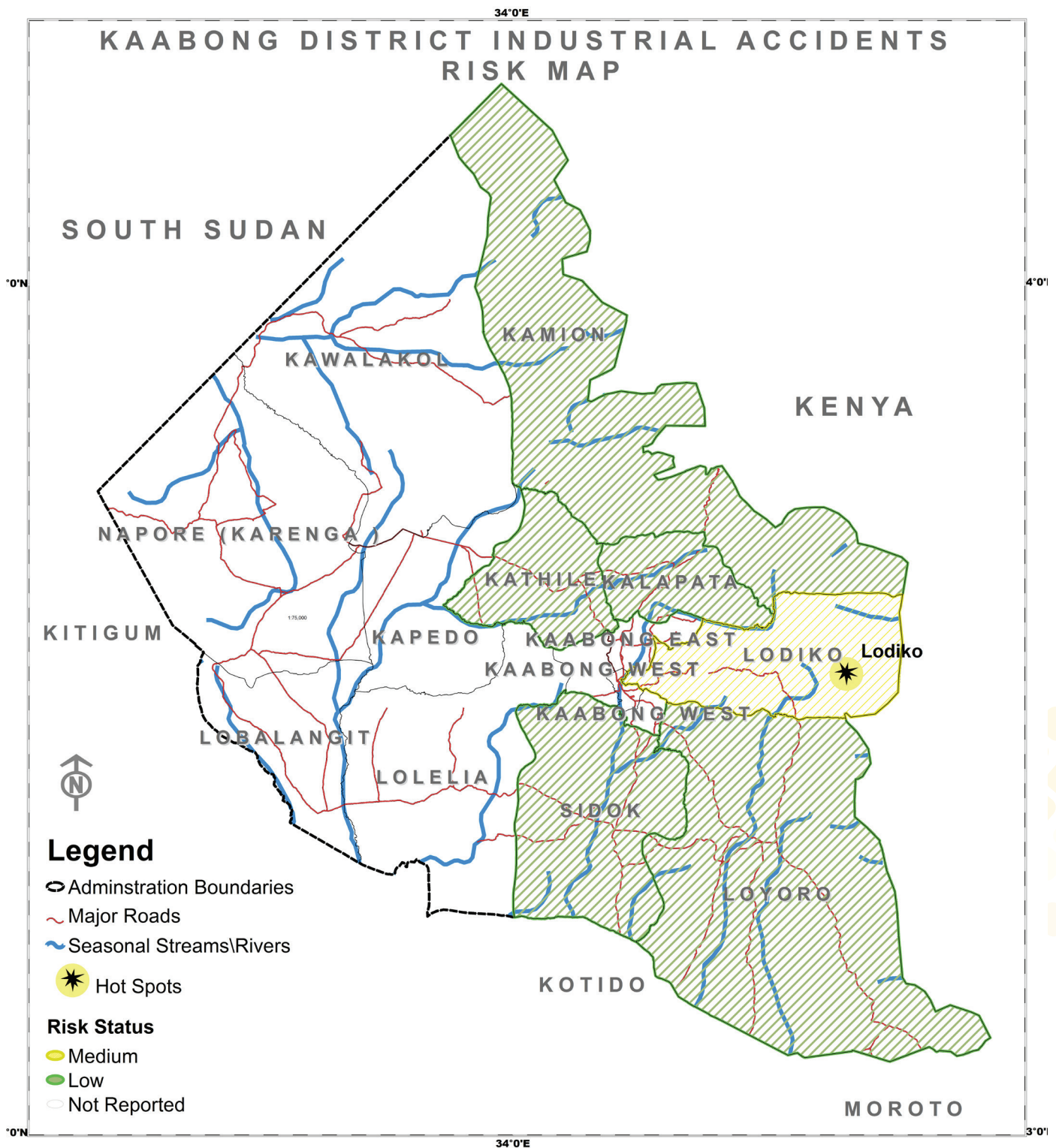


**Figure 13 Strong wind risk**

Strong winds are common in Kaabong district. Deforestation has reduced the land cover that buffered the winds and has exposed topsoils to erosion, particularly in the sub counties of Kalapata, Kaabong East and West, Kathile, Lodiko and Kaabong Town Council. Buildings, homesteads and schools often lose their roofs due to strong winds.



## Industrial accidents risk



**Figure 14 Industrial accidents risk**

Kaabong, with gold resources, attracts many people to mining in Lodiko Sub County. Deep excavations dug in search of the mineral put peoples' lives at risk. In Lodiko a pit collapsed killing a miner.



# VULNERABILITY

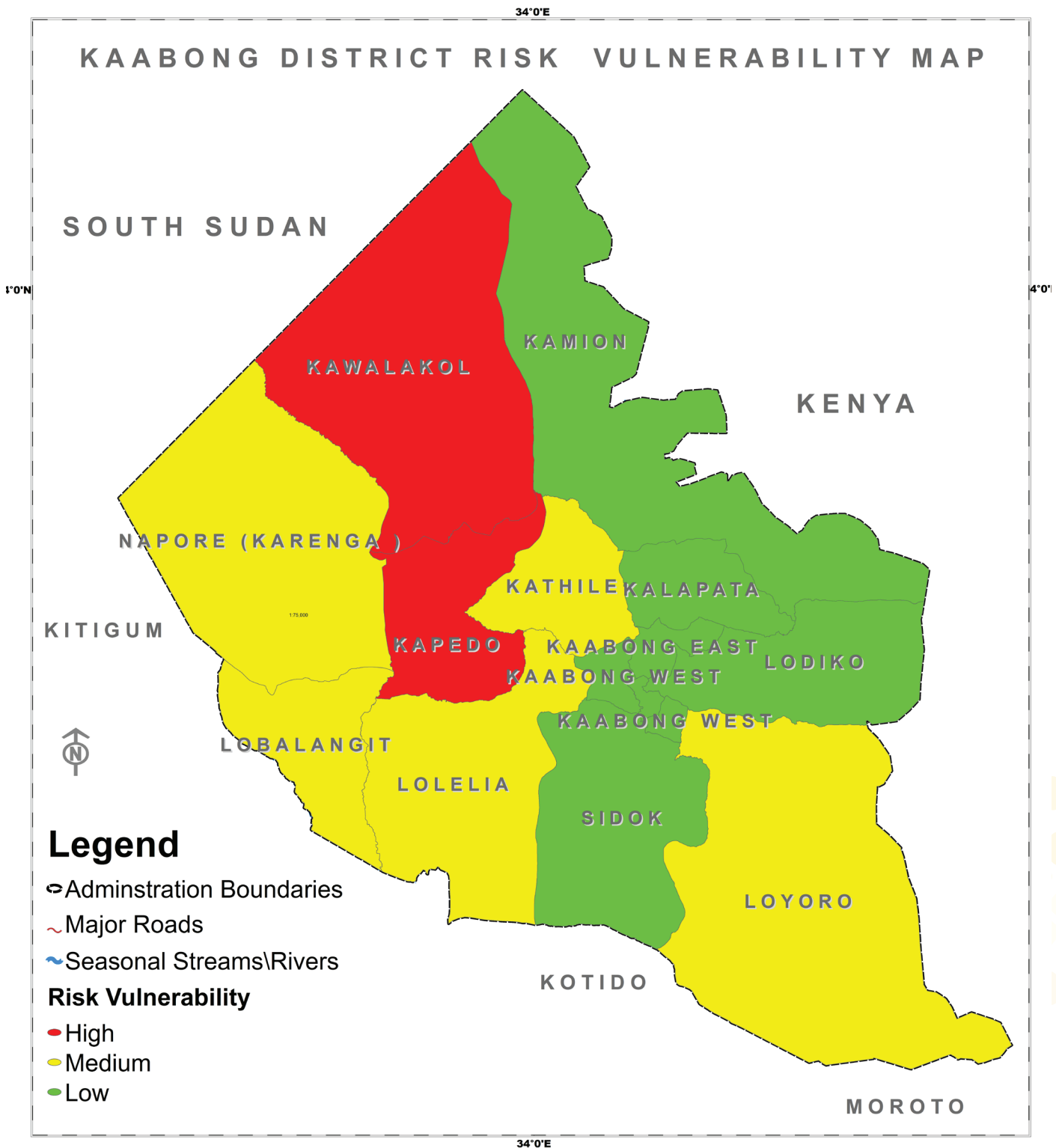
## Risk and Vulnerability Assessment

Table 7 quantifies the communities' assessment of frequency and severity of hazards shown in Table 6 by assigning numerical values to the subjective low/medium/high assignments. When sorted in descending order, the horizontal sums for each hazard provide a ranking that shows the communities' perception of the more and less serious hazards. The vertical sums corresponding to the sub-counties indicate their level of relative vulnerability and exposure to aggregate threats.

Hazard	Kaabong TC	Lodiko	Lobalangit	Karenga	Kawalakol	Lolelia	Kapedo	Kaabong West	Kaaabong East	Kalapata	Loyoro	Sidok	Kathile	Kamion	Totals
Drought	3	3	1	1	2	2	2	3	3	2	2	2	2	2	30
Animal disease	1	2	2	2	2	2	2	2	2	2	2	2	2	1	26
Environmental degradation		3	1	1	1	1	2	3	3	1	3	2	3	1	25
Land conflict	2	1	2	3	2	2	2	1	1	1	1	2	1	1	22
Cattle theft		2	1	1	1	2	1	1	2	3	3	2	2	1	22
Floods	1	1	2	2	2	2	2	1		2	2	1	2		20
Pest infestation		1	2	2	2	2	2	1	1	1	1	1	1	2	19
Human disease	2	1	1	2	2	1	2	1	1	1	1	1	1	1	18
Vermin			2	3	3	2	3				1	1	1	2	18
Bushfire			2	2	1	1	2	1		1	2	2	2	2	18
Hail storm, lightning	1	1	1	1	2	2	2	1	1	1	1	1	1	1	17
Strong wind	2	2	1	1	1	1	1	1	1	1	1	1	1		15
Landslide			2	1	3	1	1				1		1	2	12
Industrial accidents		2								1	1	1	1	1	7
Totals	12	19	20	22	24	21	24	16	15	17	22	19	21	17	269
Score: High = 3, Medium = 2, Low = 1, Not reported = blank															

**Table 7 Risk and vulnerability analysis**





**Figure 15 Risk vulnerability map**

The relative vulnerability of sub-counties in the district appears in the colour-coding of the map in *Figure 15*, in which the risk-vulnerability values in *Table 7* have been classified into low, medium and high ranges of vulnerability.

The highest risk vulnerability areas (red) are Kawalakol and Kapedo. The major hazards that threaten these sub counties are floods, land conflicts and vermin and problem animals among others. The low-lying nature of the area makes it highly susceptible to floods. Population growth with demand for land, contentious resettlement and disputes with park authorities contribute to



conflict. Proximity to wildlife protected areas brings wild animals to forage in community gardens. Most of the hazards in the moderately vulnerable sub-counties (yellow) had a relatively small impact on the communities, with lower severity and frequency.

The low vulnerability risk areas (green) are Kamion, Kalapata, Lodiko, Sidok, Kaabong East, Kaabong West and Kaabong Town Council. Although these sub counties have relatively low vulnerability, hazards such as industrial accidents, hail storm and lightning, bushfires among others impact the communities.



# CONCLUSIONS

The multi-hazard vulnerability profile produced in this mapping exercise combines physical data and perceptual information captured with participatory methods in Kaabong District. It provides an understanding of how the district perceives each hazard based on likelihood of occurrence and its impact on the local communities.

The findings identify drought, animal disease, environmental degradation, land conflict, cattle theft, floods, pest infestation, human disease, vermin, bushfire, hail storm, lightning, strong winds, landslide and industrial accidents as the predominate hazards in the district, in order of decreasing risk.

All of the sub-counties have significant vulnerability to disaster, accumulating risk from several hazards. Karenga, Kawalako, Kapedo and Loyoro record the highest aggregate vulnerability levels compared to the other sub-counties in the district. Even the least vulnerable, Kaabong Town Council, has high risk of drought and medium risk of land conflict, human disease and severe winds. This aggregated vulnerability to several hazards at once compounds the exposure to disaster risk and the complexity of managing it.

The mapping exercise demonstrates the value of integrating spatial information with community perception of hazards in the understanding of disasters in Kaabong District. This disaster risk knowledge should therefore inform the disaster mitigation plans developed by Kaabong district local government that direct actions to minimize the impacts of hazards.



# DEFINITIONS OF TERMS

**Drought.** Drought is the prolonged shortage of water usually caused by lack of rain. Drought and famine are related because crop and livestock productivity suffer in droughts.

Food insecurity. Food Insecurity is the severe shortage of food that may lead to malnutrition and death.

**Floods.** A flood occurs when large amounts of water cover a place that is meant to be dry. Floods usually occur with high rainfall.

Landslides. These are rapid movements of large mass of mud, rocks, formed from loose soil and water. Landslides occur mainly during the rainy season, but they can also be precipitated by earthquakes. Community settlement on steep slopes and other uncontrolled land use practices increase the probability of landslides.

**Diseases.** This is the occurrence of a disease, in a particular community and at a particular period, beyond normal levels and numbers. Diseases may affect people, crops or livestock.

Human Diseases. The diseases include cholera, meningitis, hepatitis E, marburg, plague, avian influenza, ebola and sleeping sickness among others.

Crop and animal Diseases. Animal Diseases include swine fever, foot and mouth disease, nagana, and bird flu. Crop Diseases include coffee wilt, banana bacterial wilt, cassava mosaic and cassava brown streak disease.

**Heavy storms.** Heavy storms in Uganda are often accompanied by hail, lightning and violent winds. Storms can result in destruction of crops, animals, public facilities and human settlements. Lightning can be deadly and may be mitigated by lightning ground conductors on buildings.

Pest infestation. These are destructive insects, worms, caterpillars or any other animal that attacks crops or livestock. Common pests in Uganda include weevils, locusts and caterpillars.

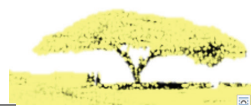
**Vermin.** Baboons, chimpanzees, bush pigs and other animals which raid crops cause damage and losses which may significantly diminish agricultural productivity.

Land conflict. These are conflicts arising from ownership and use of land and other land resources.

**Cattle rustling.** This is when one community raids another to steal livestock.

Environmental Degradation. This results from poor land use and other unsustainable ecosystem exploitation that lead to deterioration of the environment. Overgrazing, cultivation on sloping land, unguided and uncontrolled use of fertilizers and pesticides, bush burning, overfishing, deforestation, mining, poor wastewater treatment, inappropriate waste disposal and wetlands reclamation are examples of causes of environmental degradation.

**Mines and unexploded ordinance.** Mines are devices designed to explode with fatal effect when





disturbed. Unexploded ordinance are unspent bullets, grenades, rockets, etc., which are discarded or stored.

**Bush fires.** Fires set deliberately to clear forest or pasture for agricultural purposes may go out of control and consume far more than intended.

**Earthquakes.** Earthquakes results from sudden violent movements of the earth surface, sometimes causing massive loss of lives and property due to building collapse.

**Invasive Species.** A non-native plant or animal that invades a habitat or bioregion with adverse economic, environmental, and/or ecological effects. An example is a grass that is dominating pasture in the Rwenzori sub-region, reducing the grazing capacity of the land.



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