THE REPUBLIC OF UGANDA

Ngora District

Hazard, Risk and Vulnerability Profile

2016

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ACRONYMS

AU	African Union
CAO	Chief Administrative Officer
CDPC	City Disaster Policy Committee
CDMTC	City Disaster Management Technical Committee
CSOs	Civil Society Organisations
DDPMC	District Disaster Preparedness and Management Committee
DDPC	District Disaster Policy Committee
DECOC	District Emergency Coordination and Operations Centre
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
FGDs	Focus Group Discussions
GIS	Geographical Information Systems
GoU	Government of Uganda
GPS	Global Positioning System
HFA	Hyogo Framework for Action
IDPs	Internally Displaced Persons
IATC	Inter Agency Technical Committee
IGAD	Inter Governmental Authority on Development
IMPC	Inter Ministerial Policy Committee
IATC	Inter- Agency Technical Committee
IPCC	Inter- governmental Panel on Climate Change
LC	Local Council
MLHUD	Ministry of Lands, Housing and Urban Development
MGLSD	Ministry of Gender, Labour and Social Development
MoLG	Ministry of Local Government
MS	Micro Soft
NARO	National Agricultural Research Organisation
NDPMC	National Disaster Preparedness Management Committee
NECOC	National Emergency Coordination and Operations Centre
NEMA	National Environment Management Authority
NFA	National Forest Authority
NGO	Non-Governmental Organisations

NIC	National Incident Commander
OPM	Office of the Prime Minister
OVC	Orphans and vulnerable children
PEAP	Poverty Eradication Action Plan
SCDMC	Sub County Disaster Preparedness and Management Committee
UCC	Uganda Communication Commission
UN	United Nations
UPDF	Uganda People's Defense Forces
URA	Uganda Revenue Authority
UWA	Uganda Wildlife Authority
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Developments Programme
UNOCHA	United Nations Office for Co-ordination of Humanitarian Affairs
UXO's	Unexploded Ordinances
VDPMC	Village Disaster Preparedness and Management Committees

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

EXECUTIVE SUMMARY

This Ngora 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 Uganda National disaster risk atlas. 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:	Requirements analysis, work planning, team building, logistical arrangements
Phase II:	Stakeholder mapping, consultation, spatial data acquisition, secondary data assessment
Phase III:	Data cleaning, analysis and verification
Phase IV:	Dissemination workshop

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

It was established that Ngora District is vulnerable to nine hazards, in order of decreasing risk: environmental degradation, prolonged dry spell, crop pests and diseases, proliferation of invasive weed species, internal conflicts, flooding, animal vectors and diseases, heavy storms and human epidemics.

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.

Though it has no sub-county that is in the red (high) category of the vulnerability scale, the district has a high level of cumulative vulnerability to hazards.Kapir, Kobwin, Ngora and Mukura sub-counties displayed medium vulnerability with cumulative vulnerabilities of 16, 15, 14, and 14 respectively and each with a weighted vulnerability 5 which lies in the middle (yellow) category of the vulnerability scale. Ngora T/C was the least vulnerable sub-county in the district with a weighted vulnerability value of 3.

All sub-counties are prone to seven compound hazards; prolonged dry spell, animal vectors and diseases, crop pests and diseases, internal conflicts, environmental degradation, heavy storms and invasive weed species. These were ranked as the most widespread and disastrous of the nine hazards in the entire district.

Timely early warning systems and other DRR interventions would be able to enhance the resilience of the people of Ngora to the effects of climate change.

INTRODUCTION

Ngora District is vulnerable to a number of hazards that lead frequently to disasters. They include environmental degradation, prolonged dry spell, crop pests and diseases, proliferation of invasive weed species, internal conflicts, flooding, animal vectors and diseases, heavy storms and human epidemics

The Ngora District Local Government and the Department of Relief, 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 analyzing disaster risks and vulnerabilities inNgora 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 andinform the development of the district's 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 Ngora 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 Langosub-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 Langosub-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 purview 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 truthingincluded 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 included:

- 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/FGDs
- 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, onscreen 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

Ngora District is located in Teso Sub Region of the Eastern Region of Uganda. It borders KumiDistrict in the East, Serere District to the West, SorotiDistrict in the North West, Katakwi District in the North and Pallisa District in the South. Ngora District headquarters are in Ngora Town Council and is about326 km from Kampala.

It lies approximately between: latitude $1^0$10' North and $1^0$35' North and longitude $33^0$30' East and $34^0$20' East. Ngora District covers a total area of 715.9km^2, out of which 177.44km^2 is land area while 330.76Km^2 (18.7%) is covered by open water bodies and swamps/wetlands. The main water bodies include Lakes Bisina, Nyaguo, Meito and Nyasala.

Historical Background and Administrative Setup

Ngora District was gazetted as a district in 2010 from Kumi District. Ngora district is made up of four sub counties i.e. Ngora, Mukura, Kapir and Kobwin and 1 Town council (Ngora Town Council). In terms of administrative units Ngora district has 69 parishes and 137 villages.

Table 1: Lower Local Governments and Parishes of Ngora District

Sub-county/LLG	Parishes/wards
Kapir	Agirigiroi, Ajesa, Atapar, Kapir, Kokong, Omiito, Orisai, Agule, Koloin, Akarukei, Abatai, Ajello, Ajuket, Oluwa and Omuriana.
Kobwin	Aciisa, Akarukei, Atoot, Kadok, Kobwin, Kodike, Opot, Tiling, Kococwa, Kaderun, Omoo, Okapel, Agule, Oswara, Kalengo and Pokor.
Mukura	Akubui, Kaler, Kokodu, Kumel, Madoc, Morukakise, Mukura, Okunguro, Agogomit, Ajeluk, Kamodokima, Ariet, Adul, Akeit and Kees.
Ngora	Agu, Ngora, Tididiek, Nyamongo, Odwarat, Oteteen, Apama, Kopege, Angod and Omaditok.
Ngora Town Council	Eastern ward (Kobuku, Kabakuli, Okisimo, and Kachinga), Western ward (Okoboi, St. Aloysius Complex A&B and Osigiria), Southern ward (Ngora Township A&B, Konyila and Kobuin) and Northern ward (Komodo, Akoroi, and Ngora Institutional Complex).

Source: District Planning Unit, Ngora (2014)

Climate and Vegetation

The rainfall pattern in Ngora District is bi-modal with peaks in April-May and July- August. The mean annual rainfall ranges between 800-1000mm while the mean annual temperature is 24^0c. The District climate is the modified equatorial type. In the recent past however rainfall patterns have become erratic and unpredictable which has resulted to frequent food shortages and severe prolonged droughts and these have contributed to food insecurity in Ngora District.

Ngora District is characterized by savannah grassland, with the poor tree cover as a result of indiscriminate cutting of trees. Nationally Ngora is among the districts with the lowest biomass cover. The population of Ngora District highly depends on wood fuel to meet daily domestic energy needs. The use of wood for brick baking, charcoal burning and the felling of trees to obtain poles for building have resulted into rampant deforestation. These have had an impact on the weather pattern and food insecurity in the district.

Topography

NgoraDistrict is flat with few undulations and isolated inselbergs in all sub-counties of Ngora, Kapir, Kobwin and Mukura. These rocks are mainly of volcanic origin.

Communication and Housing

Ngora district has gazetted district roads, trunk roads and community access roads. There is one airstrip in Ngora district situated in the NGO hospital of Ngora (Freda Carr). Ngora district is also traversed by a railway line from Kumi border to Soroti border. The railway transport was abandoned following the insurgency in Teso in the late 1980s. Its operation is expected to boost trade in the district since a feasibility study has been done and the consultant has given three options: minimum rehabilitation, partial upgrading and full upgrading.

The feasibility study is expected to be concluded soon and work on this railway line will start boosting trade in the region and the life of roads will be pro-longed since it is meant for transportation of bulky goods. The main means of transport to households in Ngora district however is a bicycle. Ngora district has one sub-post office which offers postal and telephone services. Mobile phone services are provided by Zain, UTL, Warid, Orange and MTN networks. This makes Ngora district easily accessible by mobile telephone.

Most rural houses in Ngora district are grass-thatched, with mud or wattle walls and rammed earth floor. In urban centers of Ngora town and upcoming urban growth centers, the state of houses is improving gradually though characterized by a mix of temporary and permanent housing units.

Energy and Minerals

Energy

The main source of energy for cooking in Ngora is wood fuel, used by about 99.9% of households, while 0.02% of households use electricity or gas, 0.03% use paraffin and 0.07% use other services. The district too has one power line 450 volts. This makes Ngora a potential for industrial development, however, no area has been designated for industrial development.

Minerals

Ngora district has clay, sand and stone mining. However, high value mining has neither been explored nor exploited.

Education and Sports

Ngora district has a total of 84 education institutions of which 69 constitute primary schools where 57 are government aided and 12 private owned. Known nursery schools are 12. The district has 10 secondary schools, 5 are government aided and 5 private. It has 1 private technical school and 1 core primary teachers college. The district also has 1 nurses' training school.

Medical and Environmental Health

Ngora district has got 1 hospital, 6 Health center III's and 4 Health center II's.

Table 2: Health Facilities in Ngora District by ownership

	Government	NGO	(PPP)	Total
Hospital	00	01		
Health Centre IV	01	00		01
Health Centre III	06	00		06
Health Centre II	03	01		04
Total	10	02		12

Source: District Health Office, Ngora.

Private Health Units

Ngora district has 02 private pharmacies, 20 drug shops (only 4 of them are licensed), 10 clinics and 3 allied clinics (licensed by Allied Health Professional Council).

Table 3 Number and Categories of Health Facilities by Ownership

Category	Number	Ownership
Hospitals	1	NGO
Clinics	10	Private
Pharmacies	02	Private
Drug shops	20	Private
HC I	1	Private
HC IV, III, II.	9	Government

Source: District Health Office, Ngora district.

Accessibility of Health Services

The average distance to the nearest health facility is 5 kms; the catchment population being by health unit is 11,871 and the percentage of the population within 5 km radius of a health unit is 90%. Ngora district has 20 private clinics (only 4 of them are licensed): the ratio of Practicing Doctors to population ratio is 1:47,487, the ratio of Nurse to population is 1:7,915,

the ratio of Clinical Officer to population is 1:17,808, and Out Patient Department utilization is 95%, the deliveries in health facilities is at a coverage of 57 % and the ratio of midwives to pregnant women (15-49) is 1:323 and no available data on the number of drug stock- outs by health unit.

Public Health / Health Education

Ngora district has got 2 Health Inspectors and each of them inspects 2 sub- counties and part of Town Council. Only 2 building plans have been approved. Health programs are also carried out in schools and 12 of them are planned to be carried out. No school health Program has been carried out yet. The Health department also trains village health teams and 8 of them have been trained and garbage collection points are still in plan.

Table 4: Number of Human Waste Disposal Points in Ngora District by Type

Type of waste disposal	Number
Traditional pit latrine	1,534
Improved pit latrine	280
Ecosan toilet	4
Water closet	5
Total	**1,821**

Source: District Health Office, Ngora

Sanitation:

Usage of pit latrines is at coverage of 71.8% and water is 63.3%.

Latrine Coverage

Latrine coverage in Ngora district is 72% as per statistics from the District Health Office which is slightly bigger than the national coverage 63%. The reason for this bigger percentage is because of willingness of staff to enforce bye-laws enacted by local councils as well as implementation of the Public Health act by both District Health Office and all Lower Local Government.

Water sources

Ngora District has a number of protected and unprotected water sources which include boreholes, shallow well, springs and hand-dug wells. Ngora water supply system is complete and serves Ngora complex and Ngora Town with piped water. The district is supplied with water that is tapped from Agu (a tributary of Lake Kyoga).

Safe Water Coverage

Ngora district has 63.5 % of safe water coverage which is close to national safe water coverage which stands at 64% as reported during national annual water sector review report of 2008. The house hold distance to the nearest water source is 1km on average although are within reach of 200km or 500km. More data about safe water coverage in Ngora district is shown below:

Table 5: Safe water and Sanitation Coverage in Lower Local Governments of Ngora District

Lower Local Government	% of water coverage	% of sanitation coverage
Kapir	83	76
Kobwin	53	61
Ngora	58	63
Mukura	56	87
Average	62.5	71.8

Source: District Water Office, Ngora

Overview

Demographics

Human Population

The population of Ngora District is 157400 as projection of 2012 with 80700 female and 76700 males. The ethnic grouping in Ngora district constitutes of about 89% and 2%.

Table 6: Projected Population of Ngora District as at 2012

Sub County	2010			2011			2012		
	M	F	T	M	F	T	M	F	T
Kapir	15,100	16,500	31,600	15,800	17,200	33,000	16,600	18,900	34,500
Kobwin	16,500	17,300	33,000	17,300	18,000	35,300	18,200	19,800	37,000
Mukura	16,900	18,200	35,000	17,700	19,000	36,700	18,600	19,800	38,400
Ngora	21,200	22,400	43,600	22,300	23,300	45,600	23,300	24,200	47,500
Total	**69,700**	**74,400**	**144,100**	**73,100**	**77,500**	**150,600**	**76,700**	**80,700**	**157,400**

Source: UBOS profiles of the Higher Local Governments

Table 7:The Major Tribes and Languages Spoken in Ngora District

S/No	Tribe	Language
01	Itesots	Ateso
02	Lukenye	Lukenyi

Livelihoods

In Ngora District the major economic activity is farming; although other people depend on trade. Ngora is among the districts with least biomass cover in Uganda this results from indiscriminate tree felling to obtain charcoal, timber, wood fuel and brick baking in order to provide households incomes and needs.

The indiscriminate tree felling has had a direct effect on the weather conditions of Ngora District and food security in Ngora District.

However, agriculture remains the main economic activity (92.5%), trading in agricultural produce takes a proportion of 2.6%, employment income-2%, animal rearing -3%, fishing -0.7%, others -0.6% and trading in agricultural products - 03%.

Resources have been invested in the improvement of productivity of agricultural enterprises in Ngora District through demonstrations on use of improved technologies in groundnuts, citrus, mangoes, sunflower cassava, sorghum, sweet potatoes, cattle, goats, chicken, pigs, fisheries and bee farming. Farmers are adopting these technologies with encouraging results. The farmers in Ngora District are also engaged in other economic activities which include fishing small craft and pottery, brick making, carpentry and joinery, and building.

The NAADS (ATAAS) program has been operational in Ngora even while under Kumi in all sub counties including Ngora Town Council. The major enterprises include poultry, groundnuts, piggery,bee keeping and citrus. NAADS program encourages group approaches for both advisory technology and marketing purposes. High level farmers associations exist i.e. Tropical Fruit Growers Association, Diary Association to help in addressing marketing constrains experienced by farmers. The limiting factor is capital for commercialization of apiculture.

Ngora District has a tourism potential especially in the historical site of Apanyimo, beautiful scenery, varying cultural practices and spot fishing in the various satellite lakes even then this industry is still small and under the control of the central government, and in lake Bisina (Ramsar site) there are different rare bird species mostly the shoe bill stock and the fox weaver which is endemic to this area.

To improve on the marketing of farmers' farm products there is a proposal to establish community outlet centers for bulking, value addition and marketing of farmers' farm products in the sub-counties. Kobwin Sub-County has been earmarked to benefit from this under the LGMSD program. Other Sub-Counties will be taken on board in future.

Plans to reactivate the primary society cooperatives in Ngora District are in place through cooperative education and training of farmers in leadership, enterprise and entrepreneurship development, exposure to perform, so as to improve the cooperatives in the region and the country in general. This will also be in line with mentoring, supervision, monitoring and evaluation practices.

Furthermore, a trade policy on internal trade and capacity enhancement program for the business communities in Uganda and districts is in the offing by the Ministry of Tourism, Trade and Industry. Potential business communities will be empowered to make trade activities vibrant socially and economically.

HAZARDS

Table 8 Hazard status

Hazard	Status	Sub County
Environmental Degradation	Incidences of Wetland Degradation, Deforestation, Sand, Stone and Marrum Quarrying and Overgrazing reported	Kapir
		Mukura
		Ngora TC
		Ngora SC
		Kobwin
Internal Conflicts	Incidences of Land disputes reported	Kapir
		Ngora S/C
		Ngora T/C
		Mukura
		Kobwin
Flooding	Incidences reported	Ngora S/C
		Kapir
		Mukura
		Kobwin
Prolonged Dry Spell	Widespread in the region	All Sub Counties

Crop Pests and Diseases	Incidences of Cassava Brown Streak Disease, Mosaic, Green Mite, Mealy Bugs, reported	Mukura
		Kapir
		Ngora S/C
		Kobwin
	Fruit Fly, Citrus Canker, Citrus Scale, White Wooly Flies reported	All Sub Counties
Animal Vector and Diseases	Incidences of African Swine Fever, Rabies, Liver Disease, New Castle, Avian Reucosis reported	Kobwin
		Mukura
		Ngora T/C
		Ngora S/C
		Kapir
Human Epidemic	Incidences of Sleeping Sickness, Hepatitis B	Mukura
		Kapir
Heavy Storms	Incidences of hailstorm, heavy strong winds reported	Kapir
		Mukura
		Ngora T/C
		Kobwin
Proliferation of Invasive weed Species		All Sub Counties

Table 8 displays the status and summarizes the nature of hazards in the district and provides the locations of instances.

Table 9 provides another view of the relative significance of hazards. The right most column is ordered by the number of hazards endemic in each sub-county, and is a measure of compound vulnerability. The bottom row is ordered by the number of sub-counties that experience each hazard, giving an indication of its geographic prevalence. Table 10 ranks the hazards in their order of occurrence, frequency and magnitude. Their ranking reflects the perception of stakeholders of the relative severity of the corresponding impacts on them.

Table 9 Summary of Hazards by Sub-county

Sub county	Environmental Degradation	Internal Conflicts	Flooding	Prolonged Dry Spell	Crop Pests and Diseases	Animal Vectors and Diseases	Human Epidemic	Heavy Storms	Proliferation of Invasive Weed Species	Total
Kobwin	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Mukura	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Ngora TC	✓	✓		✓	✓	✓		✓	✓	6
Ngora SC	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Kapir	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Totals	**5**	**5**	**4**	**5**	**5**	**5**	**4**	**5**	**5**	**43**

Table 10: Ranking of hazards

S/ No.	Hazard	Frequency (Most Freq=3, Freq=2,Not Freq=1)	Area (No. of sub counties affected >10=5, 8-10=4, 5-7=3, 2-4=2, <2=1	Magnitude (High=3, Medium=2, Low=1)	Total (Sum of Columns 3,4 &5)	Rank (Descending order)
01	Environment degradation	3	3	3	9	1
02	Internal conflicts	1	3	2	7	3
03	Flooding /water logging	3	2	1	6	4
04	Prolonged dry spell	2	3	2	7	3
05	Crop pest and diseases	3	3	2	8	2
06	Animal vectors and diseases	1	2	1	4	6
07	Heavy storms	1	3	1	6	4
08	Human epidemics	1	3	1	5	5
09	Proliferation of invasive species.	2	3	2	7	3

HAZARD RISK ASSESSMENT

Table 11 expresses the communities' assessment of severity and likelihood of risk in their respective sub-counties. Each of the columns in table 11 below translates into respective hazard risk maps in the following section. The colours red, yellow, and green showing the severity of the hazard risk in the table are also reflected in the corresponding maps.

Table 11: Hazard risk assessment

Sub county	Environmental Degradation	Internal Conflicts	Flooding	Prolonged Dry Spell	Crop Pests and Diseases	Animal Vectors and Diseases	Human Epidemic	Heavy Storms	Proliferation of Invasive Weed Species
Kobwin	H	L	M	M	M	L	L	L	M
Mukura	H	L	L	M	M	L	L	L	M
Ngora TC	L	M	N	M	M	L	N	L	L
Ngora SC	H	L	L	M	M	L	L	L	M
Kapir	H	M	M	M	M	L	L	L	M
Key: H = High, M = Medium, L = Low, N = Not reported									

RISKS

Environmental Degradation

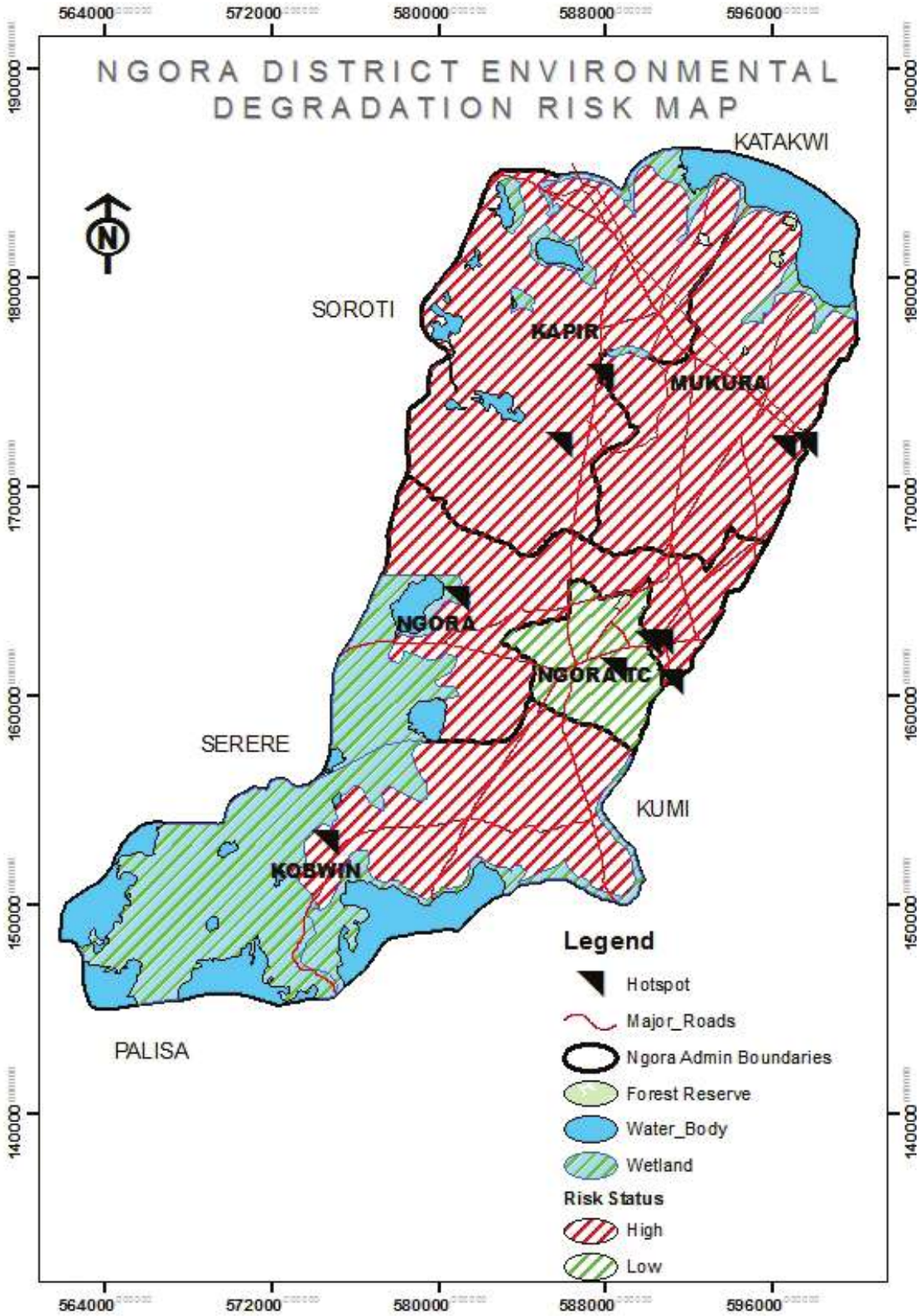

Figure 1: Environmental Degradation Risk Map
Source: Field Data Collected by OPM (May 2014)

The practices of wetland encroachment, indiscriminate deforestation, marrum extraction for road works (unrestored borrow pits are common sites), sand mining and massive sheet erosion are rampant across the district. Poor farming practices also contribute to tree felling, loss of other vegetation cover resulting into loss of top soil through erosion. This is common in all the sub-counties. These are cumulatively contributing to the negative influence on the microclimate resulting into unreliable rainy seasons and longer dry spells. This often exposes the communities to suffer seasonal food shortages

Internal Conflicts

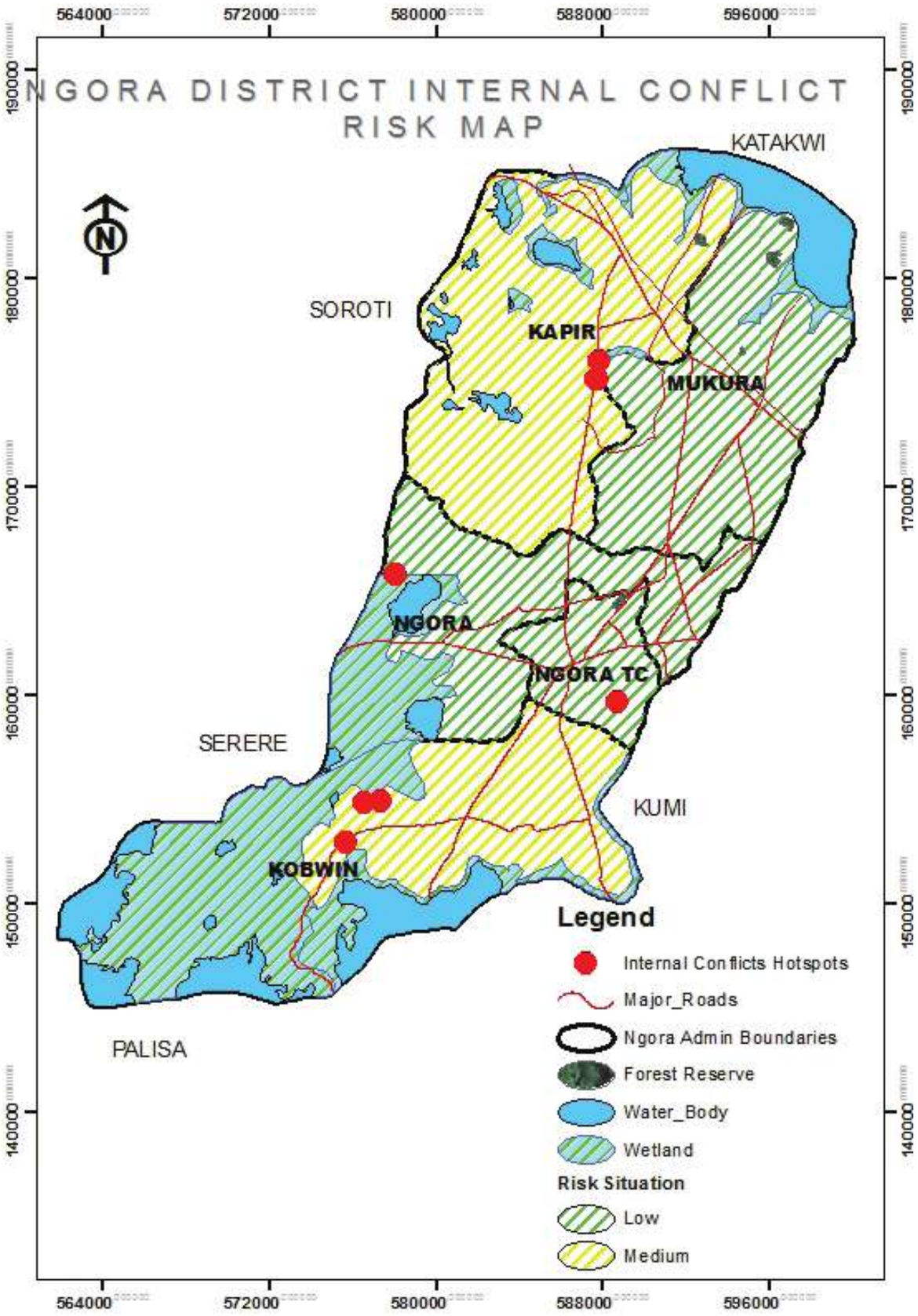

Figure 2: Internal Conflicts Risk Map

Source: Field Data Collected by OPM (May 2014)

This mainly in form of land conflicts and right of access to communal grazing land. The main contributing factor is over population of the area arising from immigration of ‘Balalo’ from south western Uganda and ‘Bakeny’ community from Palisadistrict. Internal conflicts are rampant in all the sub-counties of Ngora district particularly in the following parishes and villages: Aciisa and Opot villages in AciisaParish, and Tididiek village in Tididiek Parish and all villages in Kobwinsub-county; Kobuku Cell and Eastern Cell in Kobuku Ward of Ngora T/C (Mainly conflict over foundation of Ngora SS between the Church and the Community); Tidek Village in Tidek Parish and Agu Village in Agu Parish all of Ngora Sub County; Kakor Village in Omitto Parish in Kapir Sub County (Population pressure pushed the arable farmers to encroach on the wetlands of Lake Bisina); and Kamodokima village in Kamodokima Parish where there are land disputes due to population pressure.

Floods

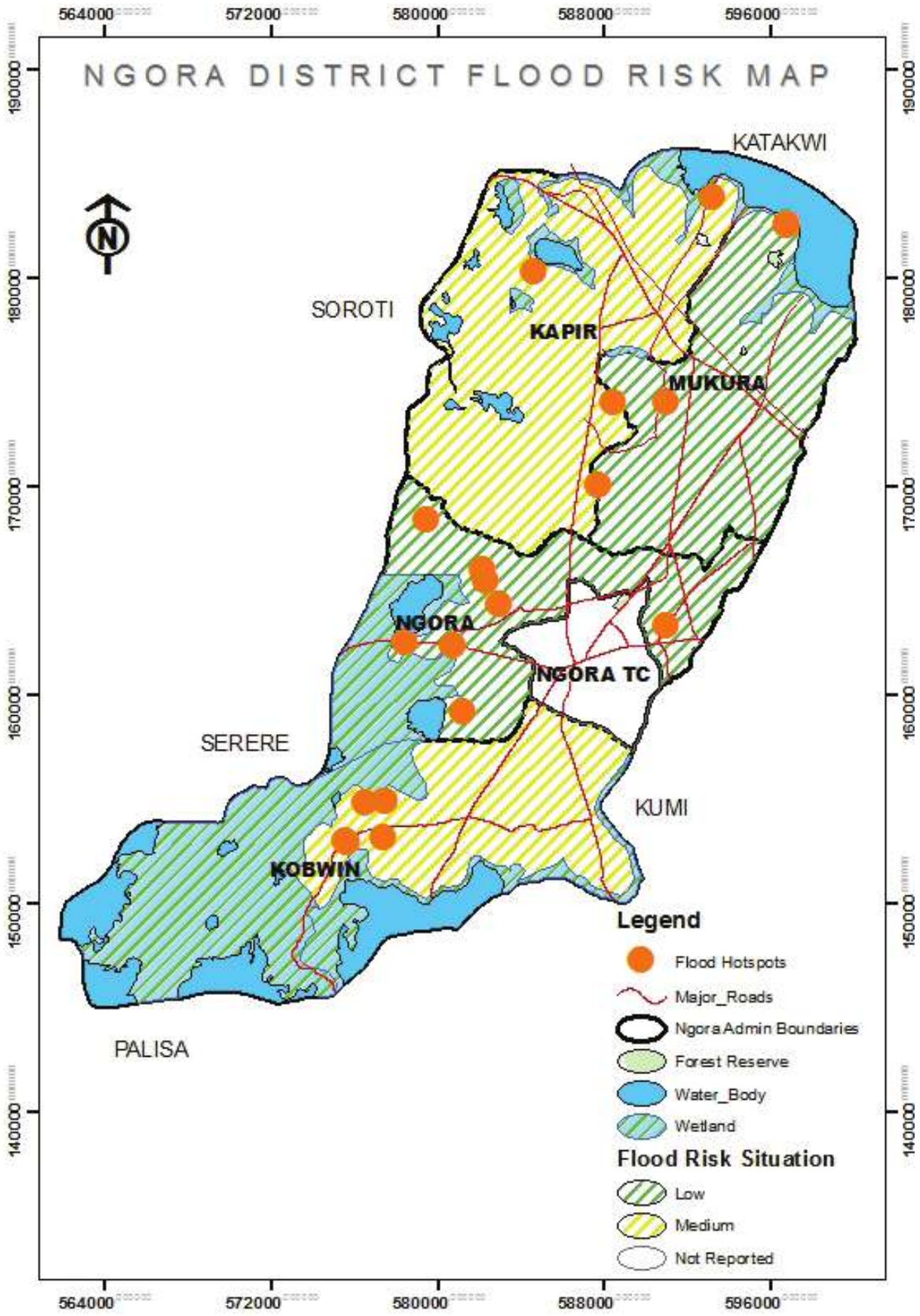

Figure 3: Flood Risk Map

Source: Field Data Collected by OPM (May 2014)

Flooding in Ngora district is experienced in all the rural sub-counties except Ngora T/C. This has resulted into destruction of crops such as millet, cassava, sorghum, potatoes among other properties like; households, roads, especially bridges. The epicenter of flooding is in the following villages, parishes and sub-counties: Swaravillage in Opot parish and Kees village in Aciisa parish, all parishes of Kobwin sub-county (due to the sandy nature of the soils and encroachment of wetlands); Aguuvillage in Aguuparish and Keesvillage of Kopege parish, all parishes of Ngorasub-county (made worse by deforestation and encroachment on the wetlands coupled with the poor soils); Akisimvillage in Akisimparish, Kakorvillage in Omitto-aguleparish, Kokongvillage in Kokong parish, Ataparvillage in Atapar parish, Akarukeivillage in Akarukeiparish, and Orisaivillage in Orisaiparish, all parishes of Kapirsub-county (being adjacent to lake Bisina in a low lying area); Punavillage in Punaparish, Apuwaivillage in Kamodokima parish, all parishes of Mukura sub-county (being adjacent to Lake Bisina in a low lying area exacerbated by the poor vegetative cover in the areas)

Prolonged Dry Spells

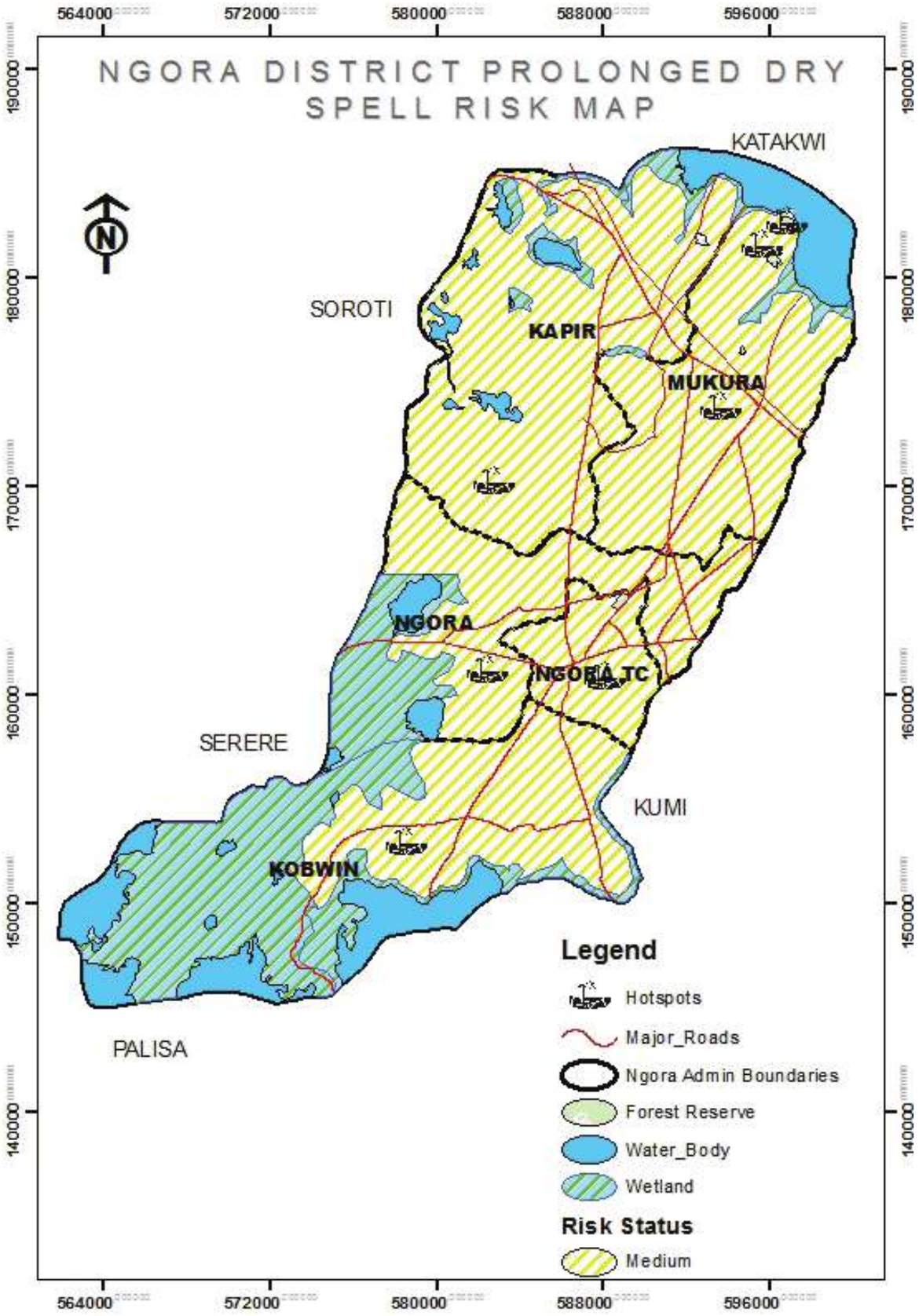

Figure 4: Prolonged Dry Spell Risk Map

Source: Field Data Collected by OPM (May 2014)

This is a widespread phenomenon in the region that all the sub-counties in Ngora district experience the prolonged dry spell. It can get severe to an extent that up till May, 2014 some villages; Puna and Akeitin,Mukurasub-county a long lake Bisina had not cultivated any gardens. This is further worsened by the human activities of environmental degradation such as deforestation and wetland encroachment. The effect of this is seasonal food insecurity and shortages in the district due to severe damages caused onto crops and animals. This reduces the water levels of most springs, dams and wells causing a serious struggle for water. The prolonged dry spell catalyses' the prevalence of bush burning by both farmers and cattle keepers to prepare gardens for the new seasons and to regenerate fresh pastures for the animals respectively.

Crop Pests and Diseases

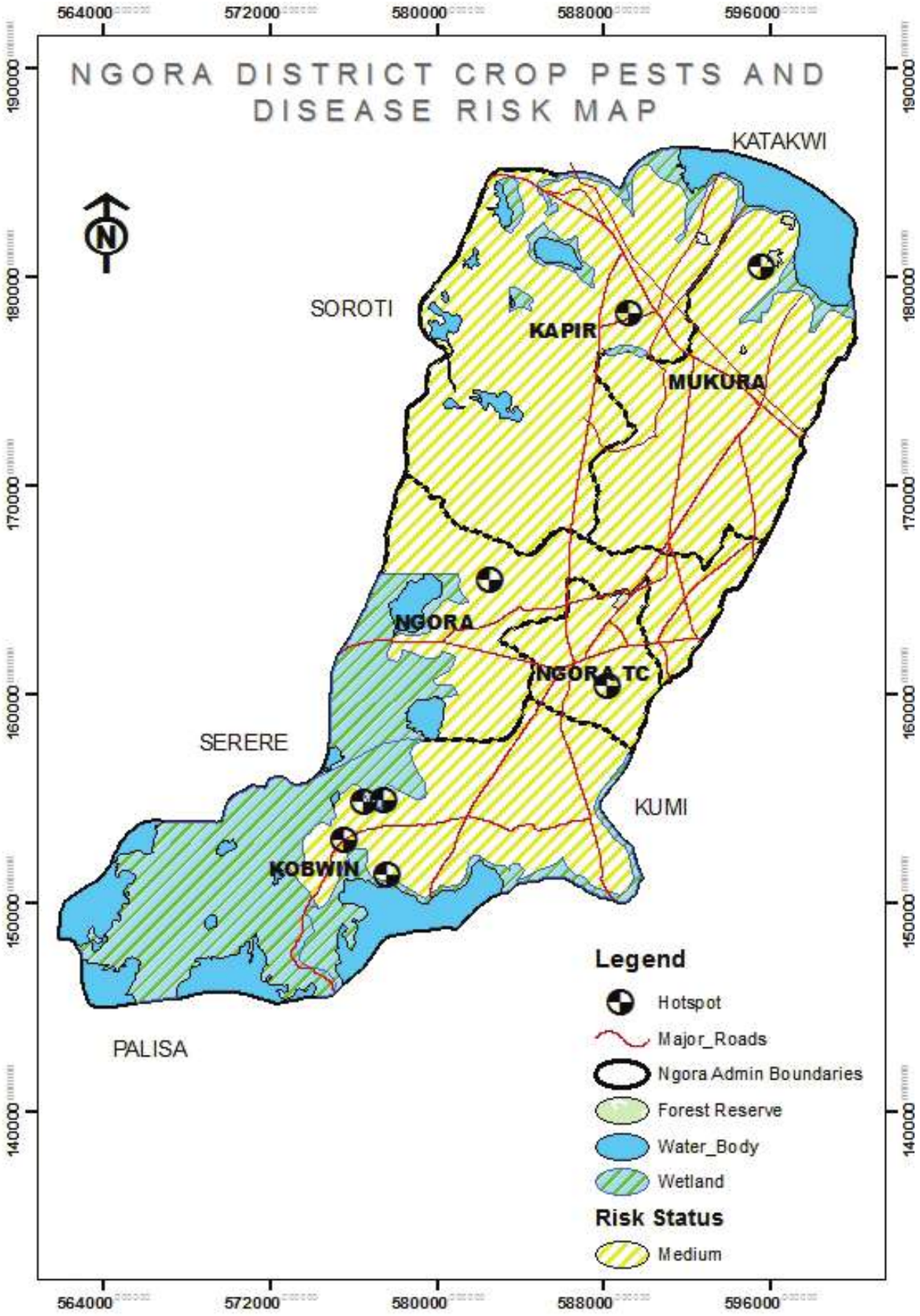

Figure 5: Crop Pests and Diseases Risk Map

Source: Field Data Collected by OPM (May 2014)

The most reported crop pests and diseases include: Cassava Brown Streak Disease, Cassava Green Mite, Cassava Mealy Bugs (mainly in Punavillage, Punaparish in Mukura Sub-county), Citrus Scale, and Wooly White Fly are wide spread in the District covering all Sub-counties. These majorly attack serials causing total crop failure and loss for farmers. Poor farming practices for example planting ofresistant crop varieties is one of the root causes of the common diseases.

Animal Vectors and Diseases

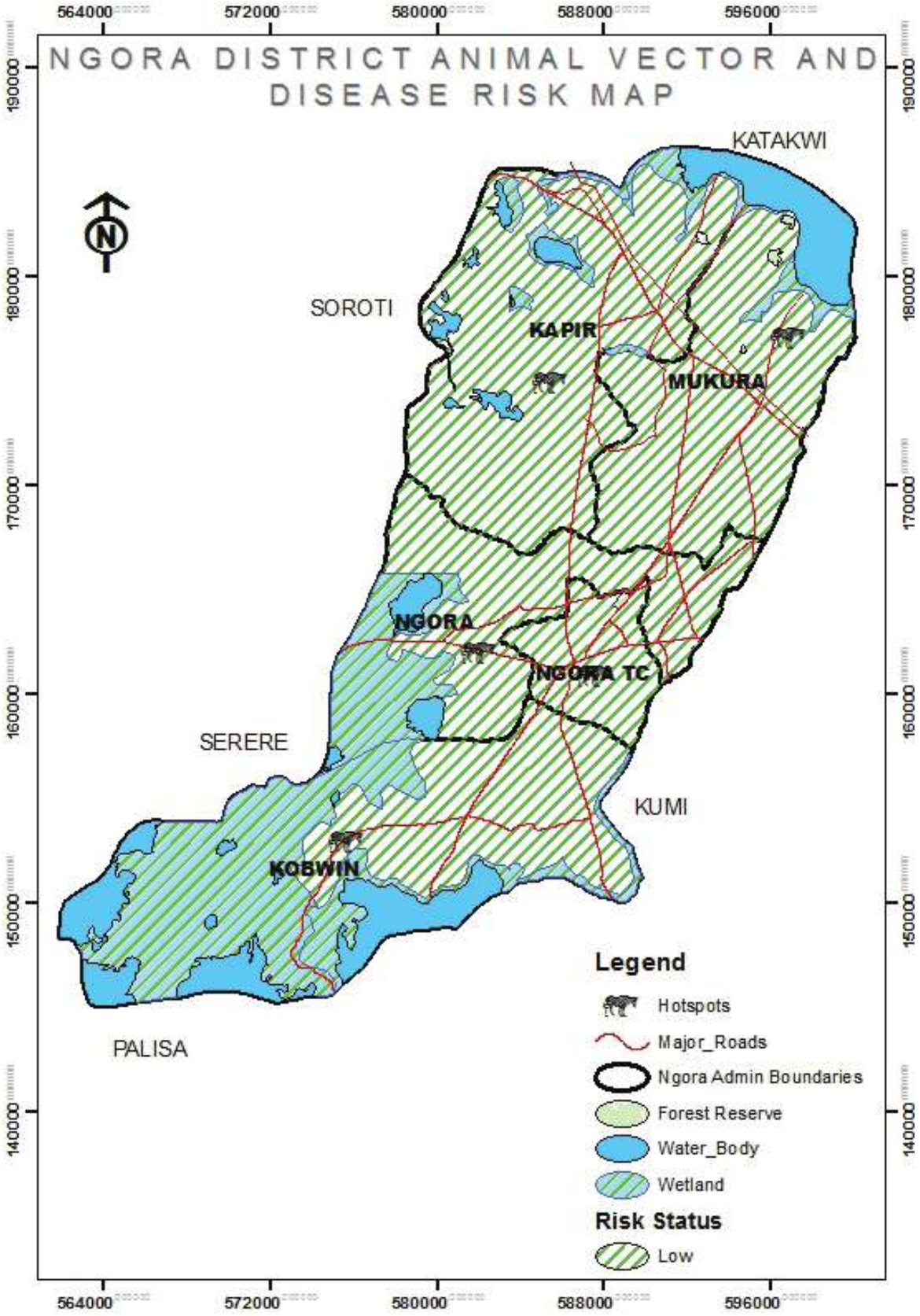

Figure 6: Animal Vectors and Diseases Risk Map

Source: Field Data Collected by OPM (May 2014)

Animal vectors and diseases just like crop pests and diseases are wide spread in the district covering all the sub-counties.

The most common of these include African swine fever in pigs, New Castle in chicken, isolated cases of rabies occurring in all the sub-counties and liver diseases in cattle. The vectors and diseases are becoming increasingly hard to control because of the practice of communal grazing in which case animals share same water points and grazing areas. It's important to note animal vectors and diseases spread very first because of this practice.

Human Epidemics

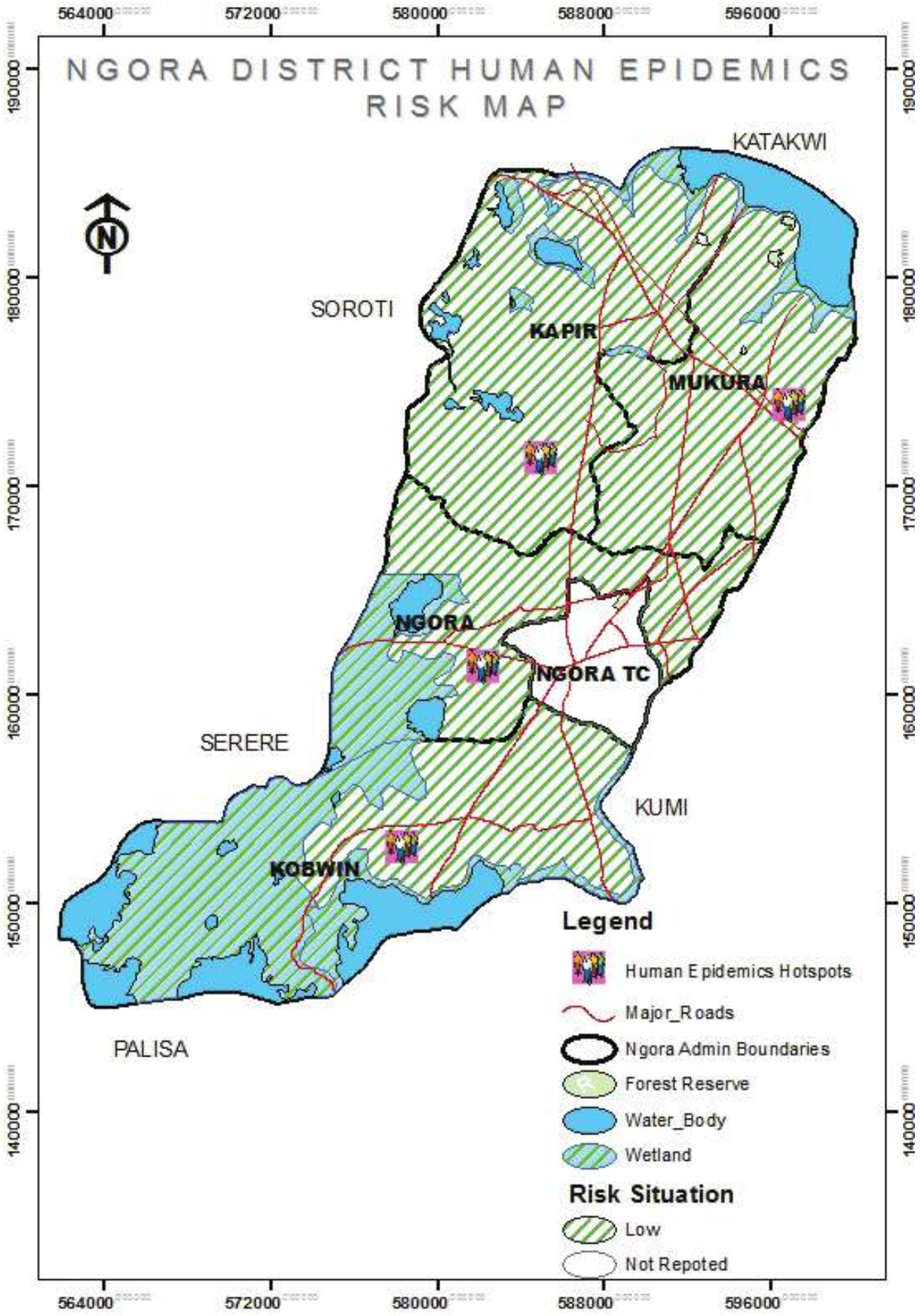

Figure 7: Human Epidemic Risk Map

Source: Field Data Collected by OPM (May 2014)

Incidences of Hepatitis ‘B a silent killer are on the increase especially in the Eastern as well as the Northern regions of Uganda. It’s a viral disease that is transmitted through sexual intercourse and contact with body fluids of infected persons. The cases of mortality and infirmity were reported in Adulvillage, Adulparish and Namasagalivillage in Kumel parish, all parishes in Mukurasub-county and Ataparvillage in Ataparparish and Olwavillage in Olwaparish of Kapirsub-county. Other cases were reported in Kobwin and Ngorasub-counties.

Heavy Storms

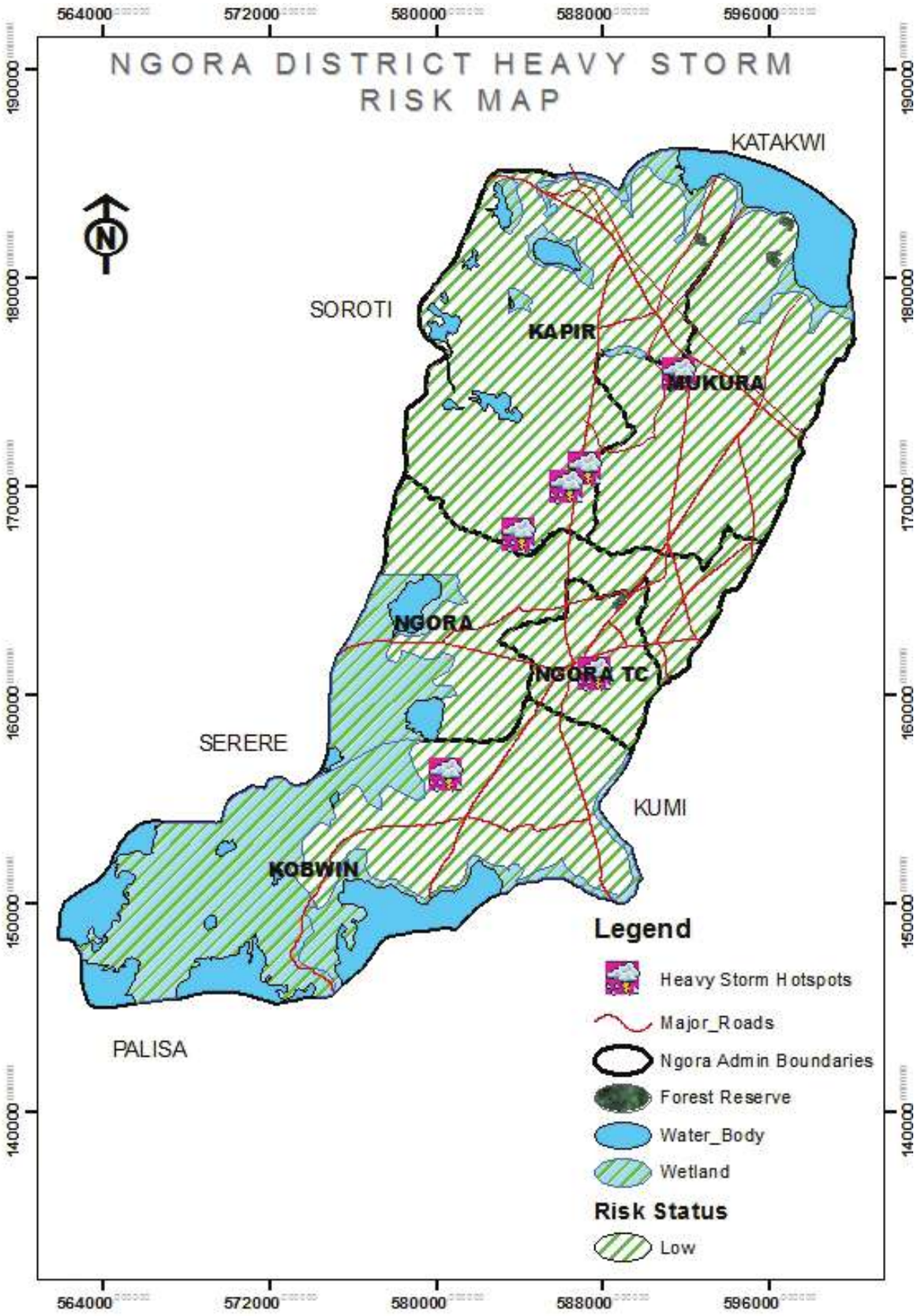

Figure 8: Heavy Storms Risk Map

Source: Field Data Collected by OPM (May 2014)

This hazard is in all sub-counties ofNgora district. The most affected villages, parishes are in Mukurasub-county while the other sub-counties reported the incidences in one parish each. These are:

Mukurasub-county in Akeitparish, Akeitvillage, Kokodu village in kokoduparish, and Kumelvillage in Kumel parish. Kokodu and Kumelprimary schools and their environs are prone to Lightning. These areas have poor vegetation cover due to indiscriminate tree cutting and poor attitude towards tree planting. This makes them vulnerable to strong winds which rununinterrupted across the localities.

Kapirsub-countyin Agirigiroiparish, in Agirigiroivillage is also vulnerable to the heavy storms for the same reasons as above. In Agirigiroi primary school a 4 classroom block, VIP latrine and staff house were de-roofed by heavy storms.

Ngora T/C in Kobukuparish, Kobukuvillage (where the District headquarters are located) is susceptible to heavy storms for the same reasons as those people of Mukurasub-county. In the same village, a district staff house was struck by lightning.

Ngora sub-county in Tididiekparish, Okorom village has poor vegetation cover due to indiscriminate tree cutting and poor attitude towards tree planting.

VULNERABILITY

Table 11 summarizes the communities' assessment of hazard severity and frequency in the sun-counties. Table 12 transforms those qualitative low/medium/high judgements to numerical values 1/2/3 which when summed vertically show the relative risk per hazard. The horizontal sums show both cumulative and weighted vulnerability.

Table 12: Risk and vulnerability assessment

Sub county	Environmental Degradation	Internal Conflicts	Flooding	Prolonged Dry Spell	Crop Pests and Diseases	Animal Vectors and Diseases	Human Epidemic	Heavy Storms	Proliferation of Invasive Weed Species	Cumulative vulnerability (Absolute)	Weighted vulnerability (Cumulative/3)
Kobwin	3	1	2	2	2	1	1	1	2	15	5
Mukura	3	1	1	2	2	1	1	1	2	14	5
Ngora TC	1	2	0	2	2	1	0	1	1	10	3
Ngora SC	3	1	1	2	2	1	1	1	2	14	5
Kapir	3	2	2	2	2	1	1	1	2	16	5
Totals	13	7	6	10	10	5	4	5	9	69	
Key: 3 = High, 2 = Medium, 1 = Low, 0 = Not reported											

Risk Vulnerability

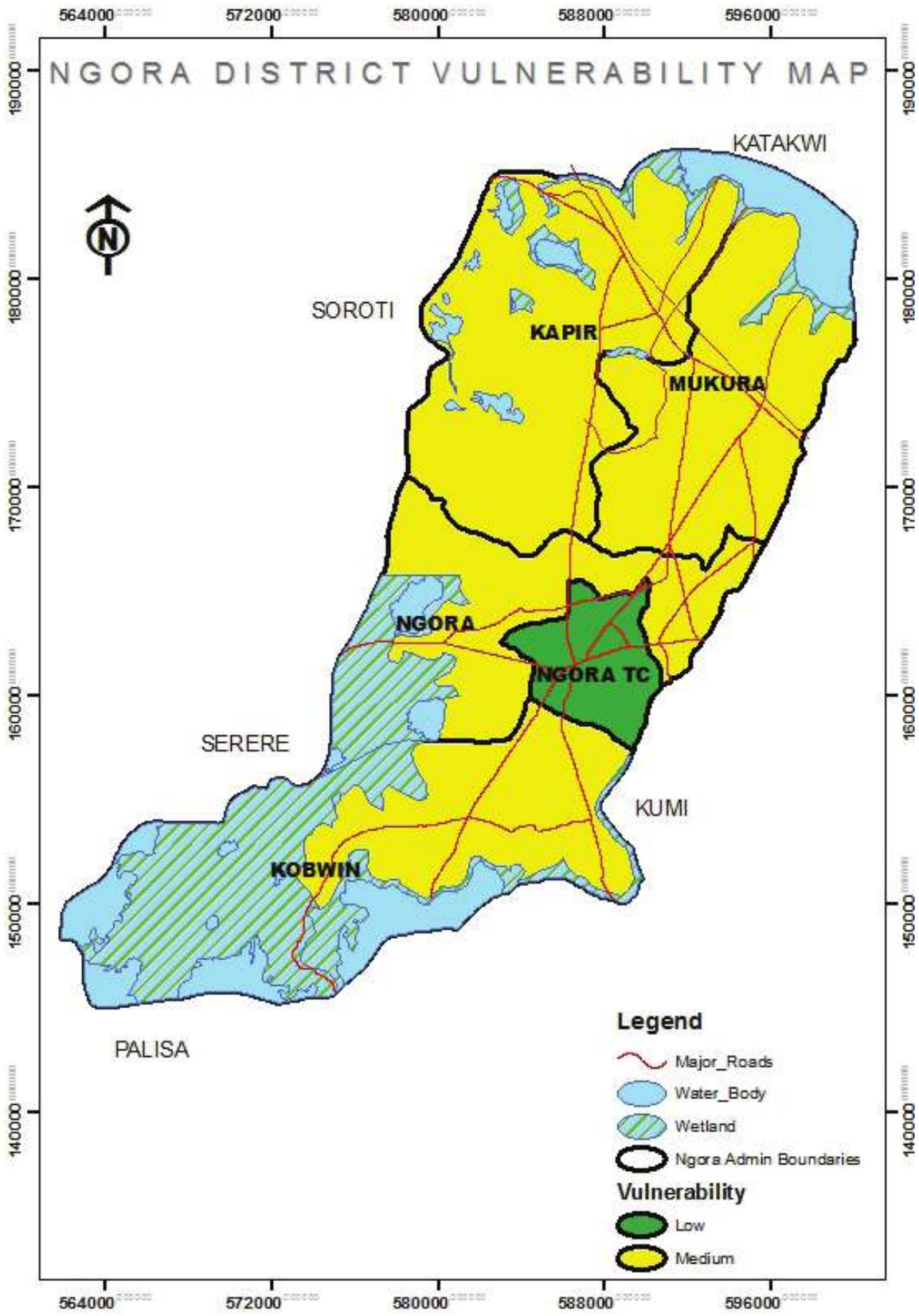

Figure 9: Vulnerability Map

Source: Field Data Collected by OPM (May 2014)

The vulnerability map in Figure 10 shows the areas of low, medium and high vulnerability according to the risk and vulnerability table (Table 11) above. In this analysis, the cumulative vulnerability of each sub-county is calculated and then weighted to provide weighted vulnerabilities for individual sub-counties. Therefore sub-counties with weighted vulnerability values less than 4 are coded “low”, termed low vulnerability areas and are assigned green, those from 5 to 7 are coded “medium”, termed medium vulnerability areas and are assigned yellow while those whose weighted vulnerabilities are 8 or more are coded “high”, termed high vulnerability areas and are represented by red.

Ngora district is exposed to 9 hazards namely environmental degradation, prolonged dry spell, crop pests and diseases, proliferation of invasive weed species, internal conflicts, flooding, animal vectors and diseases, heavy storms and human epidemics arranged in their order of risk from highest to lowest with total risks of 13, 10, 10, 9, 7, 6, 5, 5 and 4 respectively. These are worsened by poor practices that include building houses close to rivers, lack of protective embankments/walls, constructing houses with weak designs, and deforestation of slopes with poor soils.

There is no sub-county that is in the red (high) category of the vulnerability scale in the district. Kapir, Kobwin, Ngora and Mukura sub-counties displayed medium vulnerability in Ngoradistrict with cumulative vulnerabilities of 16, 15, 14, and 14 respectively and each with a weighted vulnerability5 which lies in the middle (yellow) category of the vulnerability scale. Ngora T/C was the least vulnerable sub-county in the district with a weighted vulnerability value of 3.

Though all the elements of the community are vulnerable to the fore mentioned hazards, the burden lies heaviest on the elderly elements, the children and the women. The school children and the farmers are especially vulnerable to floods than any other groups. The poor elements of these communities too feel the pinch of the hazards more than their wealthy counterparts therefore are more vulnerable.

CONCLUSIONS

This multi hazard, risk and vulnerability profile for NgoraDistrict was produced after conducting a rigorous people centred, multi-sectoral, and multi stakeholder field data collection/mapping, analysis, and map production. It is therefore a synthesis of primary data, secondary data and the perception/experiences of the local people, the community leadership at all levels. Thus it portrays how the people of Ngora perceive each of the hazards based on the past trends and the predicted likelihood of their occurrences and impact on the communities.

The stakeholders perceive that Ngora district is vulnerable to ten hazards, in order of decreasing risk: environmental degradation, prolonged dry spell, crop pests and diseases, proliferation of invasive weed species, internal conflicts, flooding, animal vectors and diseases, heavy storms and human epidemics.

Kapir, Kobwin, Ngora and Mukura sub-counties are the most vulnerable sub-counties in Ngora districteach with a weighted vulnerability of 5 which lies in the middle (yellow) category of the vulnerability scale. Though the district does not have any sub-county in the “red” (high vulnerability) category, it is fast keeping pace at the vulnerability scale and therefore should be fortified against occurrences of new hazards and exacerbation of resident hazards now occurring at lower magnitudes but which may be worsened by climate extremes expected in the near future. Ngora T/C was the least vulnerable sub-county in the district with a weighted vulnerability value of 3.

Timely early warning systems and other DRR interventions would be able to enhance the resilience of the people of Ngora to the effects of climate change.

This profile is therefore a compelling outcome of an integration of the spatial information obtained from the mapping exercise and the community perception of the hazards. It should henceforth inform the contingency as well as the district development planning process towards disaster proof plans.

DEFINITION OF TERMS

Drought. Drought is the prolonged shortage of water usually caused by lack of rain. Drought and food insecurity 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 lose 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.

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

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

Crop and animal epidemics. Animal epidemics include swine fever, foot and mouth disease, naganan, and bird flu. Crop disease epidemics 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's 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 Lango sub-region, reducing the grazing capacity of the land.

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