THE REPUBLIC OF UGANDA

Oyam 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 Organizations
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 Organizations

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

ACKNOWLEDGEMENTS

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

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

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

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

My appreciation also goes to Oyam District Team.

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

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

EXECUTIVE SUMMARY

This Oyam District Hazard, Risk and Vulnerability Profile integrates scientific information provided by GoU agencies 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.

Oyam District is located in the Lango Sub Region of Northern Uganda. It is bordered by the districts of Gulu in the North, Pader in the North East, Amuru in the North-west, Lira in the East, Apac District in the South and Masindi in the West. Physically, the district lies between: Latitudes 2^{o} 0'N, 2^{o} 7"N and Longitudes 32^{0} 2"E, 32^{0} 10"E. The District covers approximately a total area of 2,207 km^2 of which 2% is under open swamps and water while 1% is under forests leaving 2,140.4 km2 for human settlement (97.0%) and agricultural productivity. The District Head Quarters at Oyam Town Council are located approximately 78Kms from Lira Municipality, the largest city in the region.

Oyam District has one (1) County – Oyam County, twelve (12) Sub Counties including a Town Council – Oyam Town Council, two (2) Town Boards), sixty two (62) parishes and two (2) Wards, eight hundred ninety one (891) villages and nineteen (19) cells.

The Districts' topography is characterized by low plains and flat topped hills along the shores of River Nile, and lies at an average altitude of 1150mm above sea level. River Nile, Tochi and Okole swamps provide the main drainage within the District.

Oyam District has dry and wet seasons. The rainfall in the District is bimodal with one peak during April-May and the other in August-October. The dry season is from December to March and a short dry spell in June. The average annual rainfall in the District varies between 1200-1600 mm; while the average minimum and maximum temperatures are 17^{0}C and 29^{0}C, respectively. Absolute maximum temperature hardly goes beyond 36^{0}C, and absolute minimum hardly falls below 13^{0}C. Wind run is low (1-4m/sec) during the rainy season and moderate (4-8m/sec) during the dry season.

It identifies endemic hazards in 10 classes, in order of high to low risk: animal vectors and diseases, heavy storms, prolonged dry spell, internal conflicts, environmental degradation, crop pests and diseases, vermin and other problem animals, flooding, human epidemics and proliferation of invasive weed species.

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.

The most vulnerable communities in Oyam District are the people of Myene and Aber sub-counties each with a weighted vulnerability of 6 which lies in the middle (yellow) category of the vulnerability scale. Even when more than 1/3 of the sub-counties are in the green (low vulnerability) category, efforts should be taken to fortify them 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. Oyam T/C and Acaba sub-counties displayed the least vulnerability in the district each with a weighted vulnerability value of 2.

Early warning systems and other DRR interventions would be able to enhance the resilience of the people of Oyam to the effects of climate change.

This profile is a legitimate 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 planning, district development planning process towards disaster proof plans.

INTRODUCTION

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

The Oyam 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 in Oyam 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'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 Oyam 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 Lango 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 Lango 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 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 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 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, 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

Oyam District is located in the Lango Sub Region of Northern Uganda. It is bordered by the districts of Gulu in the North, Pader in the North East, Amuru in the North-west, Lira in the East, Apac District in the South and Masindi in the West. Physically, the district lies between: Latitudes 2^{o} 0'N, 2^{o} 7"N and Longitudes 32^{0} 2"E, 32^{0} 10"E. The District Head Quarters at Oyam Town Council are located approximately 78Kms from Lira Municipality, the largest city in the region. The District covers approximately a total area of 2,207 km^2 of which 2% is under open swamps and water while 1% is under forests leaving 2,140.4 km2 for human settlement (97.0%) and agricultural productivity.

Oyam District has one (1) County – Oyam County, twelve (12) Sub Counties including a Town Council – Oyam Town Council, two (2) Town Boards), sixty two (62) parishes and two (2) Wards, eight hundred ninety one (891) villages and nineteen (19) cells.

Table 1 : Administrative Units and Local Governments in Oyam District as at May, 2014

County	Sub County	No. of Parishes/Wards	No. of Villages/Cells
Oyam	Aber	04	38
	Loro	06	90
	Acaba	06	60
	Ngai	06	97
	Otwal	06	95
	Minakulu	06	91
	Myene	05	74
	Kamdini	05	48
	Aleka	05	92
	Abok	05	71
	Iceme	06	117
	Oyam Town Council	02	19
	Total	**62**	**910**

Source: Oyam District Planning Unit, 2014

The District has 3 Parliamentary seats (Oyam South, Oyam North, and Oyam Woman Member of Parliament).

Geology and Soils

The soils in Oyam District are reddish brown layer of clay loam. This covers about 90% of the cultivable land. This soil is very suitable for rain fed agriculture. The rocky soils account for 3% and the black soils accounts for 7% of the total soil mass in the District.

The Districts' natural resources include fertile arable soils in almost all Sub counties, large water Bodies Rivers, swamps, forests, water springs.

Topography and Drainage
The Districts' topography is characterized by low plains and flat topped hills along the shores of River Nile, standing at 900 meters above sea level. Oyam lies at an average altitude of 1150mm above sea level. River Nile, Tochi and Okole swamps provide the main drainage within the District.

Climate
The otherwise continental climate of the District is modified by the swampy areas in almost all parts of the District and the river Nile which passes through the south western Sub County of Aber.

Oyam District has dry and wet seasons. The rainfall in the District is bimodal with one peak during April-May and the other in August-October. The dry season is from December to March and a short dry spell in June.

The average annual rainfall in the District varies between 1200-1600 mm. The rainfall is mainly convectional and normally comes in the afternoons and evenings. The rains are well distributed in all the sub counties. However slight variations are associated with air currents on the surface (water and land) and the atmosphere. The Aribi hills in Ngai Sub-county produce significant variations within the immediate environments.

The average minimum and maximum temperatures are 17^0C and 29^0C, respectively. Absolute maximum temperature hardly goes beyond 36^0C, and absolute minimum hardly falls below 13^0C.

Land and sea breezes are common in the District. Wind run is low (1-4m/sec) during the rainy season and moderate (4-8m/sec) during the dry season.

Historical Background
Oyam District was curved from the then Apac District in 2006. It is occupied by the Lango ethnic group with its sister districts Lira, Dokolo, Amolatar and Apac. The origins of the Langi are somewhat obscure but it is believed that they originated from Abyssinia in Ethiopia. They are considered to be part of the Nilo-Hamites (also known as semi-Hamitic) group which includes the Teso, Kumam, Jie and Karamojong tribes. The Lango, in contrast of their fellows, have adopted the simpler Nilotic tongue. It is believed that their move from further North into the present habitat took place between the years 1800-1890.

Apart from times of wars, when some sort of cohesion was achieved under one or two war leaders, the Langi before the advent of British Administration in 1889 were divided into many small groups or clans each with its own leader, i.e. chieftainship. British Administration of the District dates back to 1914. Administration in the early days was in the hands of Buganda agents. The present District headquarters at Oyam was established in July 2006.

Oyam has for long been an area deeply affected by the LRA insurgency for over 20 years with a majority of its population living in over 20 camps. This was aggravated by the fact that Oyam District is majorly rural.

Presently Lango sub region has a cultural head referred to as the “Rwot Nyaci” who is equated to the “Kabaka” of Buganda, the “Omukama” of Toro, the “Kyabazinga” of Busoga and the “Emorimor” of Teso amongst others. He heads all the cultural institutions within Lango sub region and he sits at Lango Cultural Centre which is located in Lira Municipality.

Demographics

Table 2 Projected 2012 Population of Oyam District by Sub-county

Sub-county	Male	Female	Total
Aleka	10,087	10,350	20,436
Otwal	9,758	10,121	19,879
Ngai	12,499	12,677	25,176
Abok	7,682	7,584	15,266
Aber	14,203	14,543	28,746
Kamdini	13,863	14,711	28,574
Iceme	19,390	20,074	39,464
Loro	23,359	27,493	50,852
Acaba	13,003	13,551	26,554
Minakulu	11,133	12,119	23,252
Myene	11,250	11,667	22,918
Total	146,227	154,889	301,116

Source: Community Information System Data, 2009

Oyam District had a population of 268,415 with the density of 99 persons per sq km, of which 131,658 were males and 136,757were females in 2002. To date the population is 353,700. The population grew from 177,053 in 1991 to 268,415 in 2002 representing a growth rate of 3.6% between the two periods. The high growth rate is attributed to the fact that most of the population was forced to lived in camps, high poverty level, high level of illiteracy and low level of income. The population of Oyam is predominantly rural with 95% percent living in rural areas.

The sex distribution is about 51 %(female) and 49% (male)

HAZARDS

Table 3: Hazard status

Hazard	Status	Sub County
Heavy Storms	Incidences of hailstorm, heavy strong winds, Lightning reported	Loro
		Abok
		Ngai
		Myene
	Incidence of Lightning reported	Aber
		Aleka
Vermin and other Problem animal attacks	Incidences of Velvet Monkeys, Crocodile, Buffalos, Hippos, Elephants attacks reported	Myene,
		Minakulu
		Kamdin
		Aber
		Loro

Crop Pests and Diseases	Banana bacteria wilt	All Sub Counties
	Incidences of Aphids eating the tender parts of G. Nuts reported	
	Incidences of Citrus Kangka reported	
	Incidences of Fruit Flies reported	All sub county
	Cassava Mosaic	
	Incidences of caterpillars affecting Soya beans reported	Otwal
		Myene
		Minakulu
		Aleka
		Ngai
		Abok
Prolonged Dry Spell	Widespread in the region	All Sub Counties
Animal Vectors and Diseases	Incidences of African Swine Fever reported	All sub county
	Incidences of New Castle Disease among chicken reported	
	Incidences of Tsetse Flies reported Incidences of Nagana reported	
	Lampy Skin	Loro
		Aber
		Kamudini
		Minakulu
		Myene
	Tick Borne Diseases	All Sub Counties
Flooding	Incidences reported	All Sub Counties

Environmental Degradation	Incidences of Wetland Encroachment and Deforestation reported	All Sub Counties
Internal Conflicts	Incidences of Land disputes reported	All sub counties
Proliferation of Invasive Weed species	Incidences of Lantana Camara, Water Hyacynth and some species of Acacia reported	All Sub Counties
Human Epidemic	Incidences of Sleeping Sickness Incidences of Hepatitis B reported	Aber
		Iceme
		Kamdini
		Minakulu
		Myene
		Loro

Source: Field Data Collected by OPM (May, 2014)

Table 3 displays the status and summarizes the nature of hazards in the district and provides the locations of instances.

Table 4 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 5 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 4 Summary of Hazards by Sub-county

Sub county	Heavy Storms	Vermin and Other Problem Animals	Crop Pests and Diseases	Prolonged Dry Spell	Animal Vectors and Diseases	Flooding	Environmental Degradation	Internal Conflicts	Proliferation of Invasive Weed Species	Human Epidemic	Total
Loro	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Abok	✓		✓	✓	✓	✓	✓	✓			7
Myene	✓	✓	✓	✓	✓			✓		✓	7
Ngai	✓		✓	✓		✓	✓		✓		6
Aber	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Aleka	✓		✓	✓	✓		✓	✓	✓		7
Minakulu		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Iceme			✓	✓	✓	✓	✓	✓			6
Kamdini		✓	✓	✓	✓	✓		✓		✓	7
Otwal			✓	✓	✓		✓	✓	✓		6
Acaba			✓	✓	✓	✓	✓				5
Oyam T/C				✓		✓	✓	✓			4
Totals	6	5	11	12	10	9	10	10	6	5	84

Source: Field Data Collected by OPM (May, 2014)

Table 5: 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 (Ascending order)
1	Animal Diseases (BQ, CBPP, F&MD)	3	5	3	11	1
2	Crop pest and diseases	2	5	2	9	2
3	Internal conflict	2	5	2	9	2
4	Heavy Storms	2	4	2	8	4
5	Vermin and other problem animals	3	2	3	8	4
6	Floods/water logging	2	2	2	6	6
7	Prolonged dry spell	2	3	2	7	7
8	Proliferation of invasive weed species.	1	5	1	7	7
9	Human epidemic	1	5	1	7	7
10	Environmental Degradation (Deforestation, wet land degradation, overgrazing)	2	3	1	6	9

HAZARD RISK ASSESSMENT

Table 6: Hazard risk assessment

Sub county	Heavy Storms	Vermin and Other Problem Animals	Crop Pests and Diseases	Prolonged Dry Spell	Animal Vectors and Diseases	Flooding	Environmental Degradation	Internal Conflicts	Proliferation of Invasive Weed Species	Human Epidemic
Loro	M	L	H	M	H	M	L	L	N	L
Abok	H	L	L	M	L	M	M	M	N	L
Myene	H	H	M	L	H	L	M	H	N	L
Ngai	H	N	L	M	L	M	M	M	N	L
Aber	M	H	M	M	M	L	M	L	L	L
Aleka	M	N	L	L	L	L	L	M	L	L
Minakulu	M	H	L	L	M	L	L	M	N	L
Iceme	L	N	L	L	L	L	M	L	N	L
Kamdini	M	H	L	L	H	L	L	M	N	L
Otwal	N	N	M	L	M	N	L	L	L	N
Acaba	N	N	L	M	M	L	L	N	N	N
Oyam T/C	N	N	N	M	N	L	L	L	N	N
Key: H =High, M = Medium, L = Low, N = Not reported										

Table 6 expresses the communities' assessment of severity and likelihood of risk in their respective sub-counties. Each of the columns in table 6 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.

RISKS

Heavy Storms

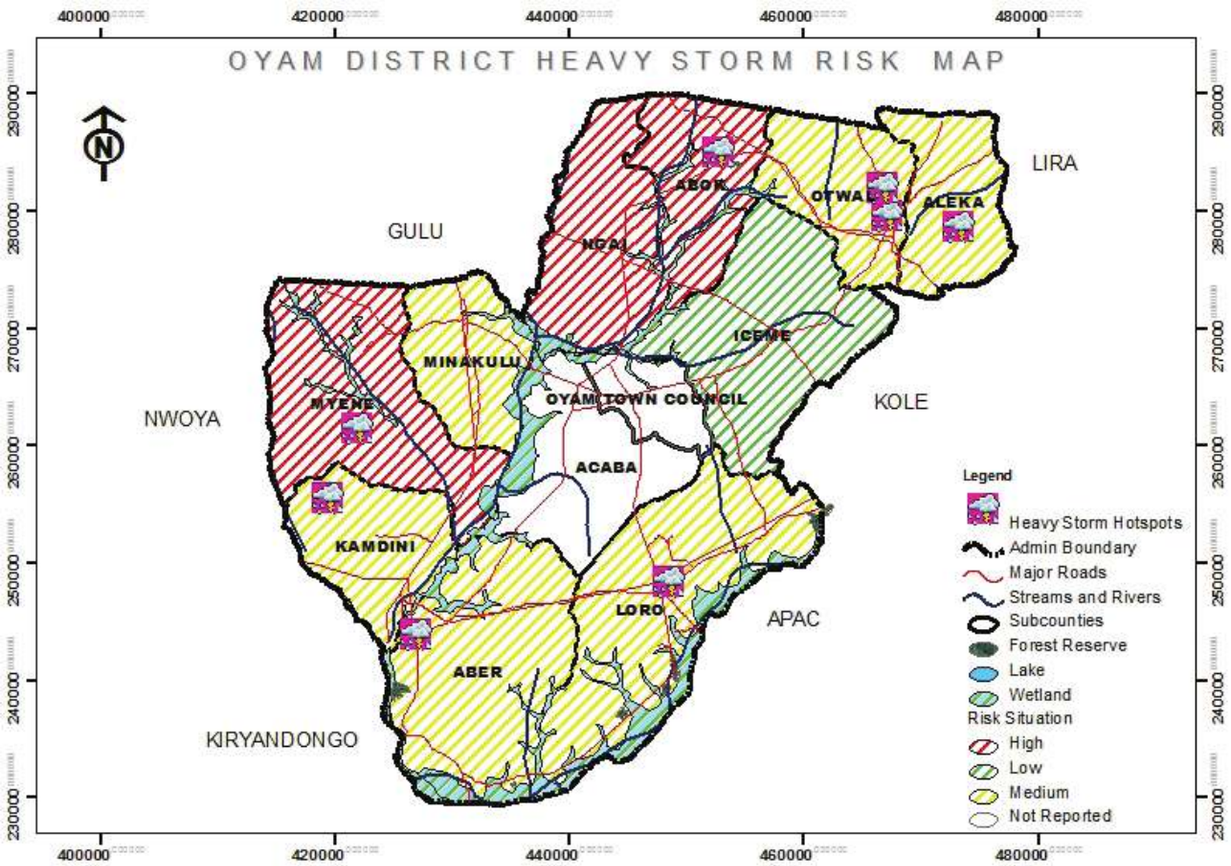

Figure 1: Heavy Storms Risk Map
Source: Field Data Collected by OPM (May, 2014)

Hailstones usually occur all over the district at the onset of first and second rainy seasons. The most affected sub-counties are Ngai, Abok, Acaba, Loro, Iceme, Aber, Kamdini, Minakulu and Myene. The most affected parishes in Ngai are Okomo, Aramita and Akuca. The most affected parishes in Abok are Bario and Ariba. The most hit parishes in Kamdini are Ocini and Pukica. The most affected parishes in Acaba are Obangangeo and Abanya. The most affected parishes in Loro are Alidi, Acan pii and Alutkot.

Vermin and problem animals

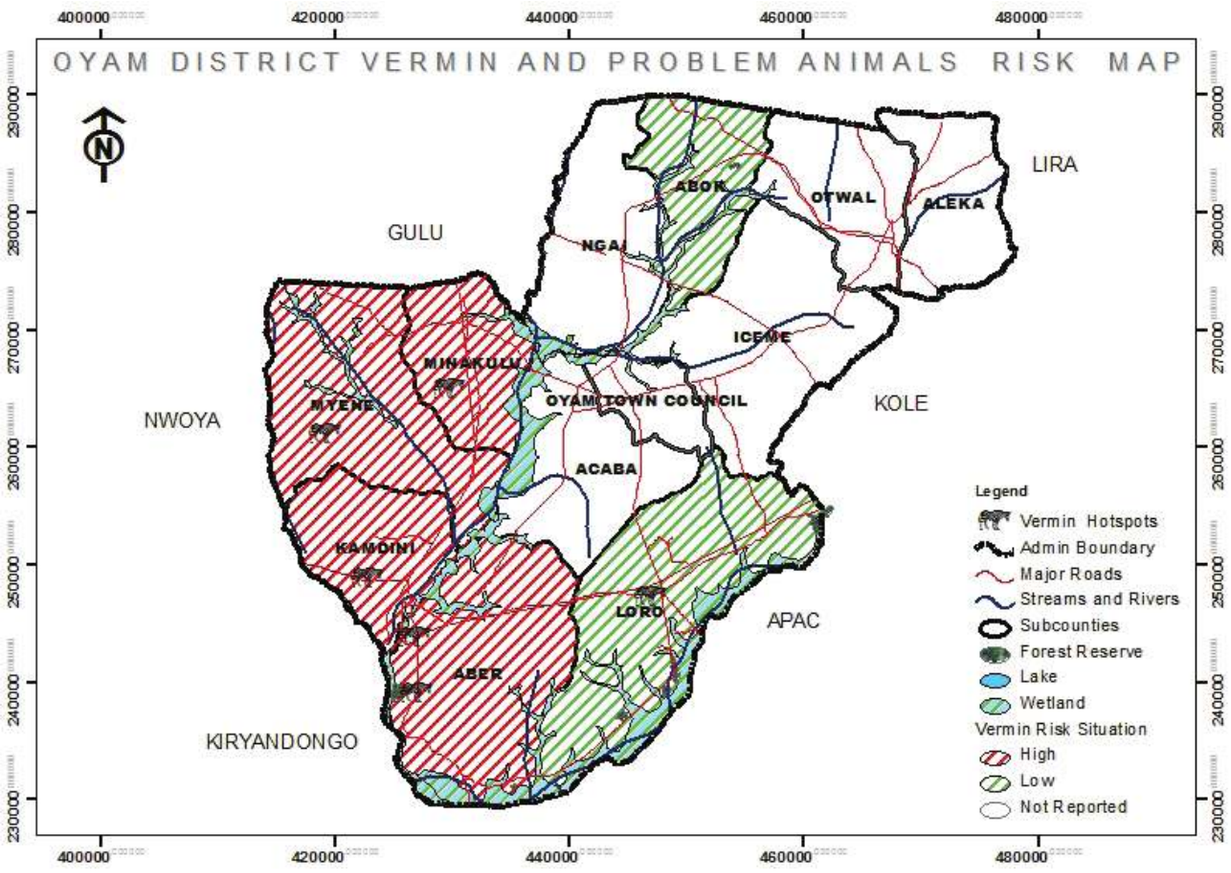

Figure 2: Vermin and other Problem Animal Attacks Risk Map
Source: Field Data Collected by OPM (May, 2014)

The sub-counties of Myene, Minakulu and Kamdini are on the frontier of Murchison Conservation Area. Consequently, vermin and problem animals destroy crops and lives. The common problem animals are crocodiles, elephants, hippopotamus and buffaloes. The crocodile attacks are severe in Juma parish, Aber sub-county. The elephants and hippopotamus wreak havoc in Myene, Minakulu, Kamdini, Aber and Loro, destroying crops and lives. The main crops destroyed are beans, maize, groundnuts, banana, cassava and mangoes. The Uganda Wildlife Authority has been supporting affected sub-counties to excavate trenches in order to keep problem animals away. However the problem animals still cross over and cause mayhem.

Despite the limited geographical extent of vermins and other problem animals, the frequent incidences result in overwhelming social and economic impacts. The challenge of other problem animals has far reaching political implications exposing the weak policy on the relationship between the neighboring communities and the conservation areas. This call for urgent policy reforms.

Note that whereas the map depicts Aber as the hotspot of this menace, it is also experienced in the sub counties of Kamdin, Myene, Loro and Minakulu though infrequently.

Crop pests and diseases

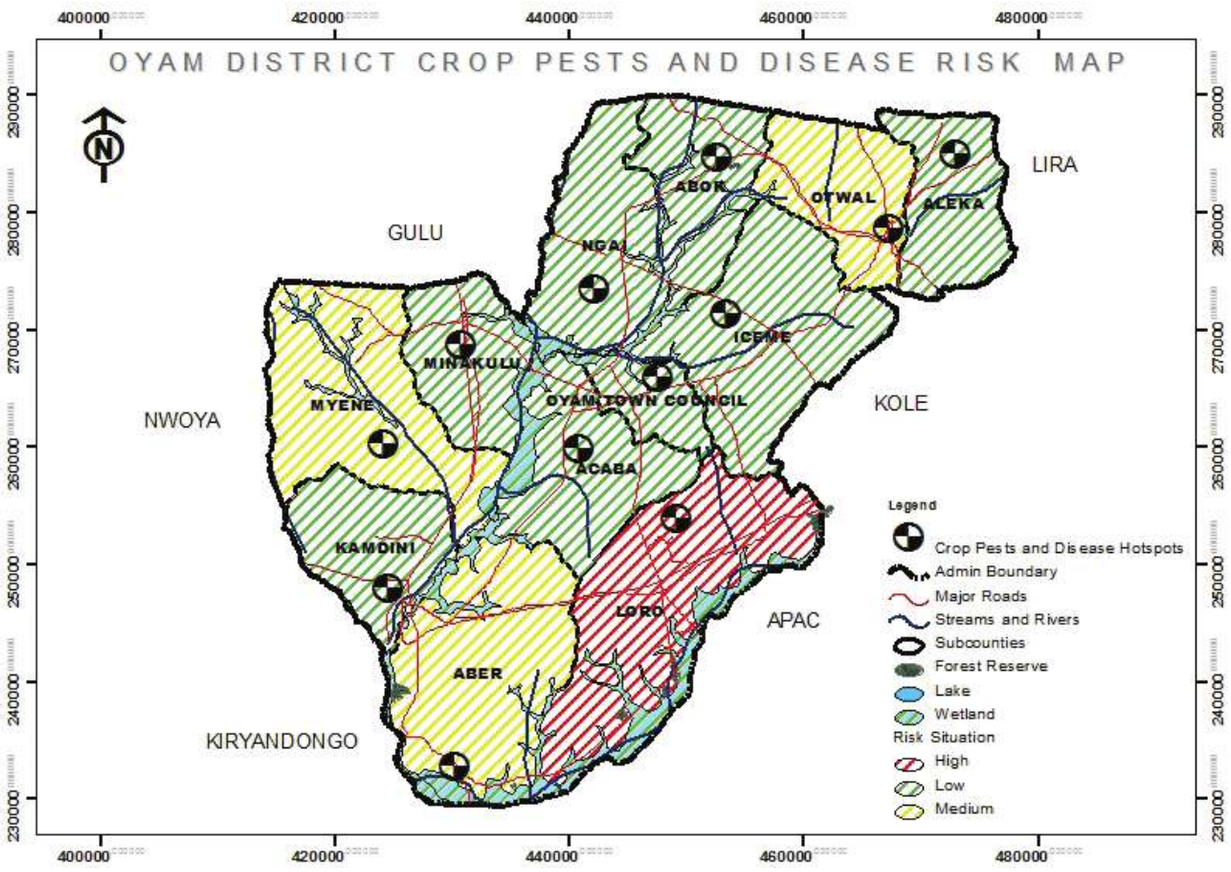

Figure 3: Crop Pests and Diseases Risk Map
Source: Field Data Collected by OPM (May, 2014)

The predominant crop pests are aphids, bean fly, army worm, stalk borer, caterpillar, fruit fly, citrus scab and otheca. The hot spots for citrus scab are Kamdini and Aber. The common crop diseases are bean anthracnose, bean rust, fusaruam, head smutts (maize, millet), cassava mosaic, sigatoka and banana wilt.

Prolonged dry spells

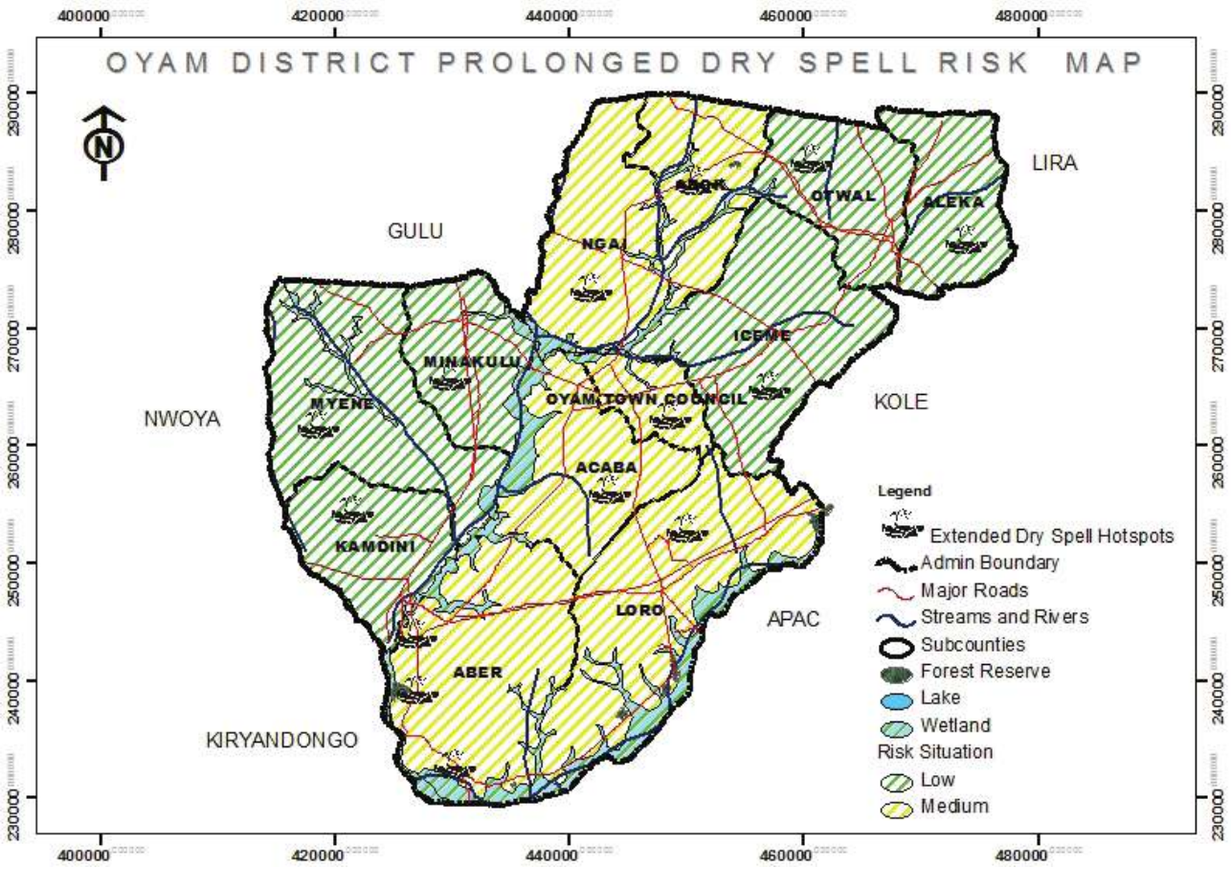

Figure 4: Prolonged Dry Spell Risk Map
Source: Field Data Collected by OPM (May, 2014)

There is a prolonged dry spell throughout Oyam district from May-July, thereby causing low production and consequent food insecurity. The worst hit sub-counties are Loro, Aber and Acaba.

Animal vector and diseases

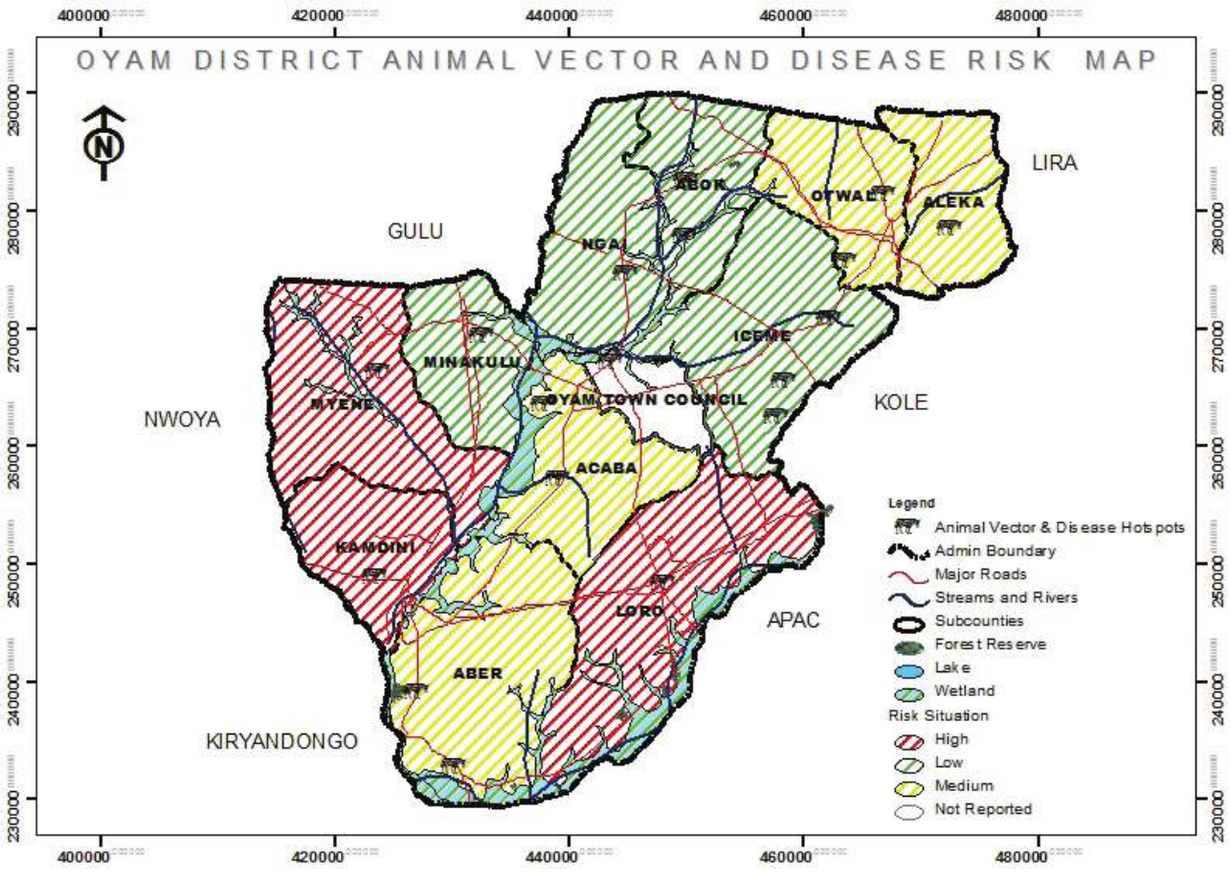

Figure 5: Animal Vectors and Diseases Risk Map
Source: Field Data Collected by OPM (May, 2014)

The predominant animal pests are tick, tsetse fly, mite and fleece. The hot spots for fleece are Kamdini and Aber. The common animal diseases are African swine fever, heart water, lumpy skin disease and nagana. Heart water is prevalent in Minakulu, Aber, Kamdini, Loro, Acaba, Iceme and Ngai. The endemic poultry diseases are new castle disease, fowl fox and coccidiosis.

Floods

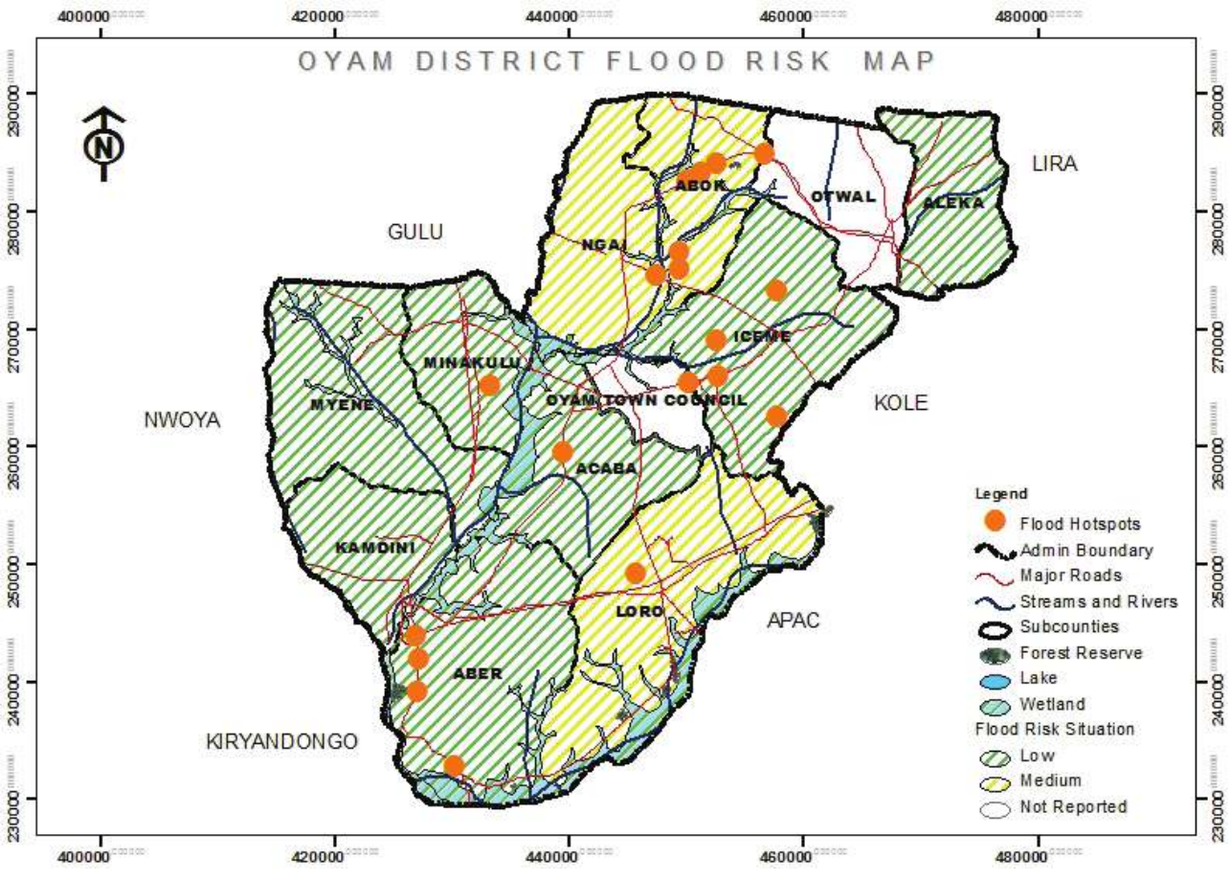

Figure 6: Flood Risk Map
Source: Field Data Collected by OPM (May, 2014)

Floods occur during rainy season throughout the district. The floods submerge gardens and homesteads, thereby destroying crops especially beans, maize, groundnuts and cassava. However extreme flooding is experienced in Ngai, Abok, Acaba, Minakulu, Aber and Loro. The most affected parish in Ngai is Aramita. In Abok, the most affected area is around akeloalyek swamp. The most affected parishes in Acaba are Obangangeo, Abanya and Dogapio. While in Aber Ocampar and Adyegi are the most affected.

Environmental degradation

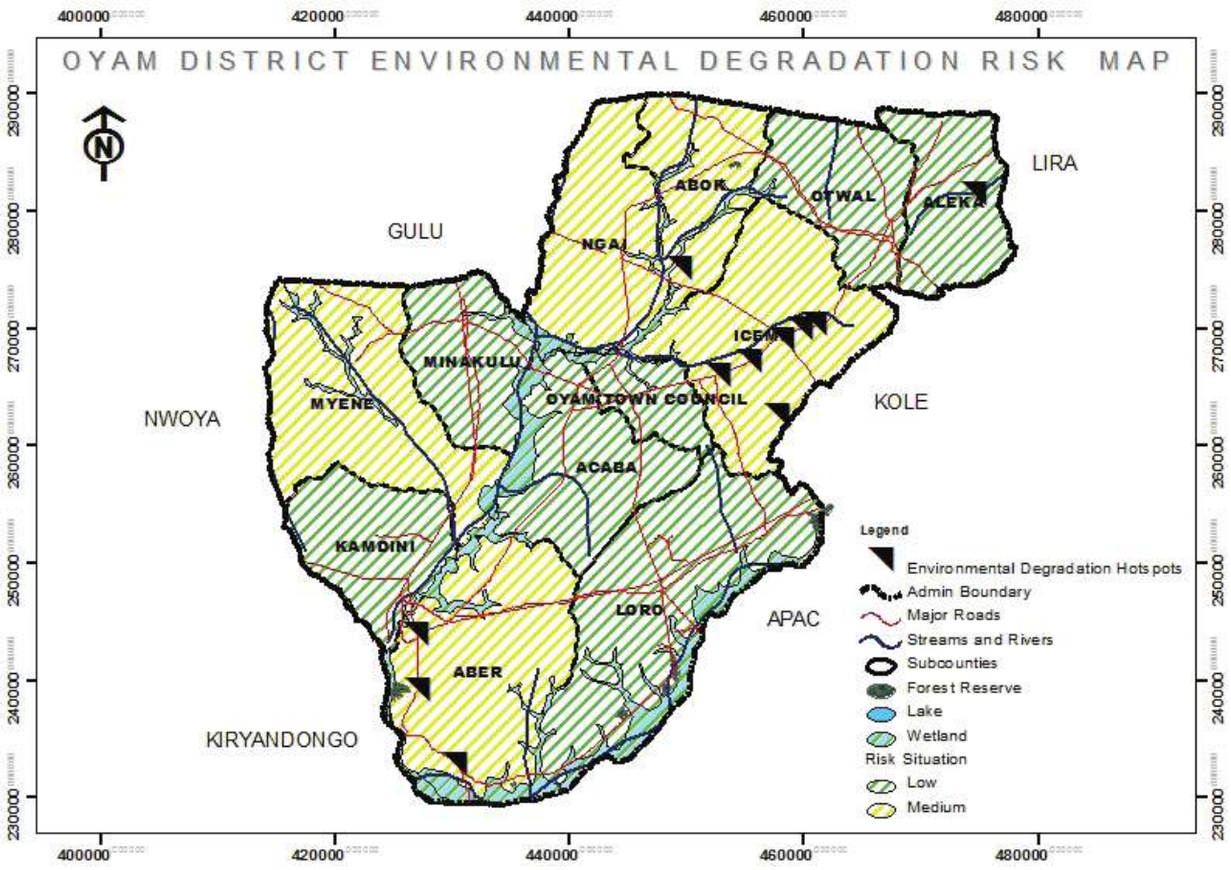

Figure 7: Environmental Degradation Risk Map
Source: Field Data Collected by OPM (May, 2014)

Oyam district is endowed with three extensive wetland systems, namely; Olony, Tochi and Okole. There are also numerous small wetlands throughout the district. These wetlands regulate the micro-climate of Oyam and provide water for domestic use and livestock watering. The wetlands are also a source of fish, wild meat, vegetables, herbs, fuel wood, construction poles, clay, sand and craft materials. There is substantial cultivation of wetlands throughout the district, especially for rice, vegetables and sugarcane production. Brick making, sand mining and fish farming are also common in wetlands.

Additionally, there is over-harvesting of the numerous wetland products for livelihood. The main drivers for wetland degradation are population growth, poverty and ignorance.

Deforestation is more serious in the central and local forest reserves in Oyam district which have been encroached and degraded to varying extents. The driver of deforestation is land shortage, fuel shortage and timber

Internal Conflicts

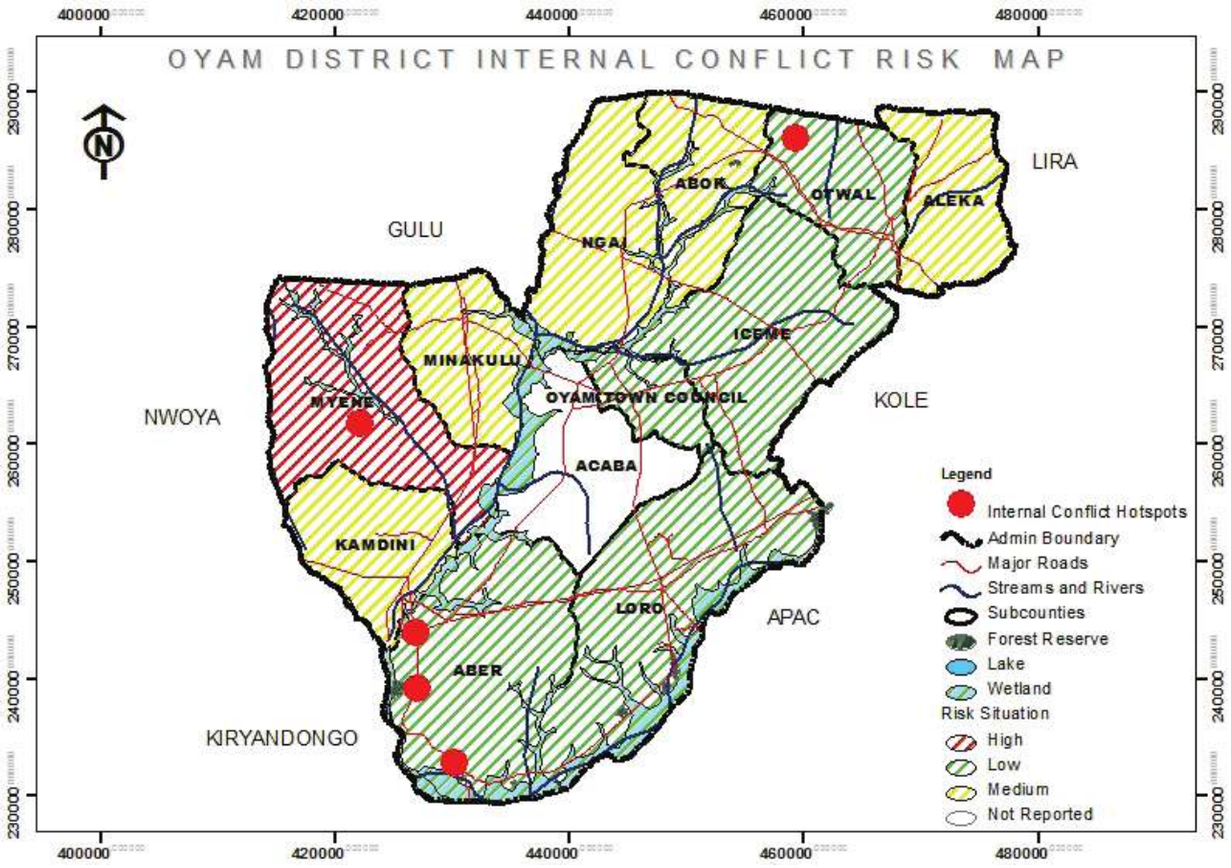

Figure 8: Internal Conflicts Risk Map
Source: Field Data Collected by OPM (May, 2014)

This is mainly in form of land disputes and conflicts over access to communal grazing land and cattle watering points (between arable farmers and the cattle keepers).

Having lived in Internally Displaced Peoples (IDP) Camps for close to 20 years, the people forgot their genuine boundaries of land coupled to loss of elders who knew the boundaries. Several claims and counterclaims over ownership of land became the order of the day. The elders, LC courts and even magistrates courts at all levels are filled with such cases of land ownership.

Other than land ownership, there is also the conflict over access to communal grazing land and watering points mainly between the arable farmers who encroach on the wetlands and cattle keepers. The disputes are made rifer when the animals stray into the gardens of the arable farmers.

Invasive weed species

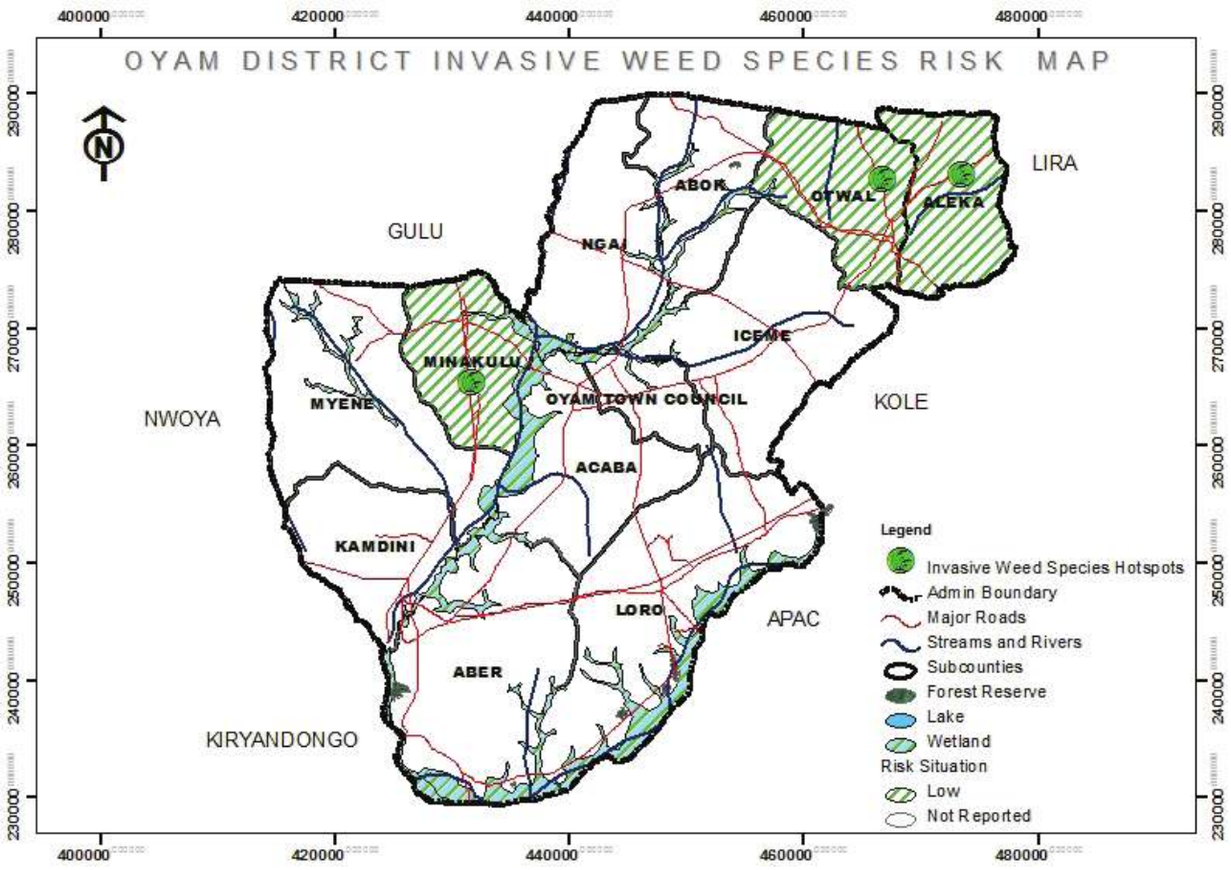

Figure 9: Proliferation of Invasive Weed Species Risk Map
Source: Field Data Collected by OPM (May, 2014)

The prevalent invasive species include Lantana camara and congress weed. Lantana camara is widespread while congress weed is associated with former Internally Displaced People's Camps in Minakulu, Ngai, Abok, Iceme, Oyam T/C and Aleka. These weed species colonize the arable lands and out compete the crops planted by the locals thus considerably reducing the yields, which is associated with food shortages and malnutrition among the children.

Human Epidemics

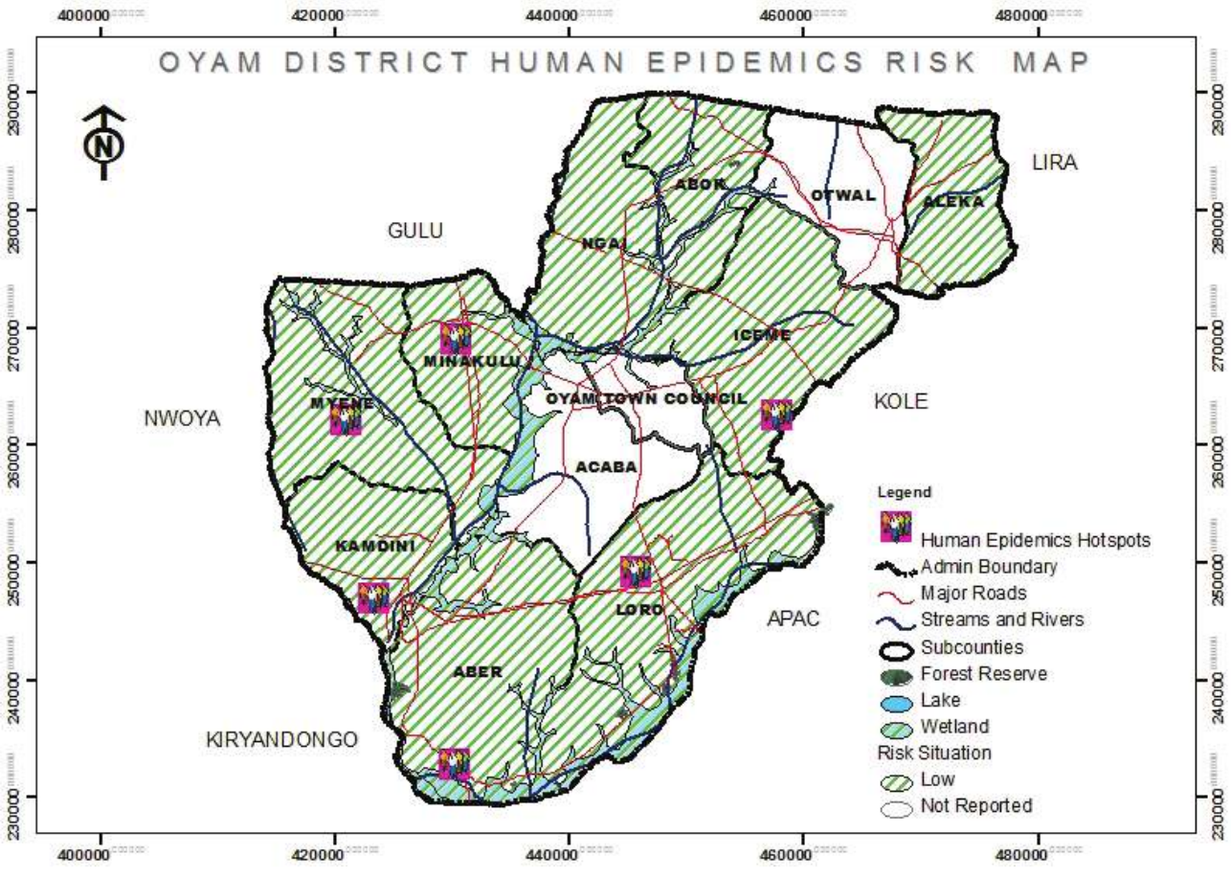

Figure 10: Human Epidemic Risk Map
Source: Field Data Collected by OPM (May, 2014)

The most scaring human epidemic reported is Hepatitis B a viral disease transmitted through contact with body fluids and sexual intercourse. It is reported in Loro, Myene, Aber, Minakulu, Iceme, and Kamudini. The most affected is Loro sub-county where three deaths have been reported in just one year with several infirmities confirmed. Other parishes in the same sub-county include Acan Pii and Alidi.

The Neglected Tropical Diseases (NTDs) are common along the Albert Nile bank and Murchison falls conservation area. The NTDs include: Sleeping sickness and River blindness. The sub counties at risk are: Myene, Kamdini, Minakulu and Aber.

VULNERABILITY

Table 6 summarizes the communities' assessment of hazard severity and frequency in the sun-counties. Table 7 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 7: Risk and vulnerability assessment

Sub county	Heavy Storms	Vermin and Other Problem Animals	Crop Pests and Diseases	Prolonged Dry Spell	Animal Vectors and Diseases	Flooding	Environmental Degradation	Internal Conflicts	Proliferation of Invasive Weed Species	Human Epidemic	Cumulative vulnerability (Absolute)	Weighted vulnerability (Cumulative/3)
Loro	2	1	3	2	3	2	1	1	0	1	16	5
Abok	3	1	1	2	1	2	2	2	0	1	15	5
Myene	3	3	2	1	3	1	2	3	0	1	19	6
Ngai	3	0	1	2	1	2	2	2	0	1	14	5
Aber	2	3	2	2	2	1	2	1	1	1	17	6
Aleka	2	0	1	1	1	1	1	2	1	1	11	3
Minakulu	2	3	1	1	2	1	1	2	0	1	14	5
Iceme	1	0	1	1	1	1	2	1	0	1	9	3
Kamdini	2	3	1	1	3	1	1	2	0	1	15	5
Otwal	0	0	2	1	2	0	1	1	1	0	8	3
Acaba	0	0	1	2	2	1	1	0	0	0	7	2
Oyam T/C	0	0	0	2	0	1	1	1	0	0	5	2
Totals	20	14	16	18	21	14	17	18	3	9	150	
Key: 3 = High, 2 = Medium, 1 = Low, 0 = Not reported												

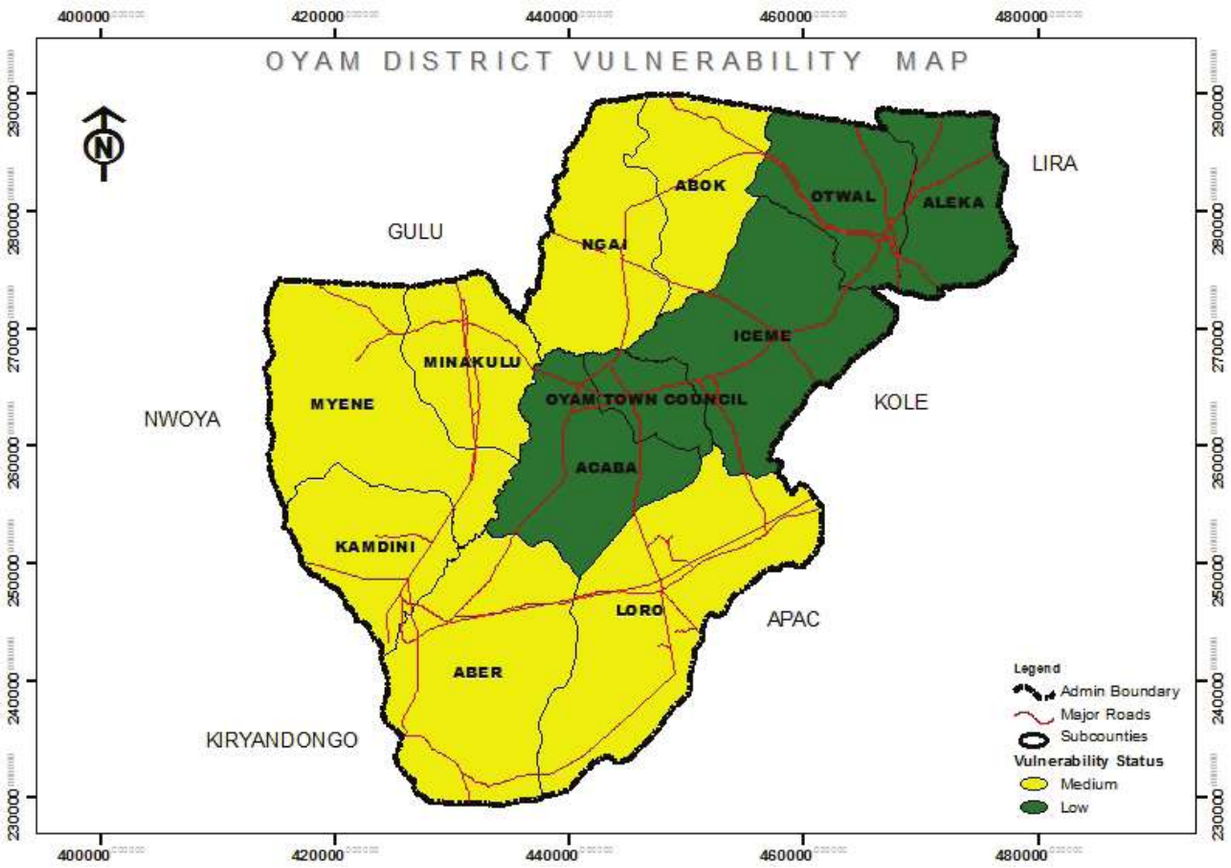

Figure 11: Vulnerability Map
Source: Field Data Collected by OPM (May, 2014)

The vulnerability map in Figure 11 shows the areas of low, medium and high vulnerability according to the risk and vulnerability table (Table 8) 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.

Oyam district is exposed to 10 hazards namely animal vectors and diseases, heavy storms, prolonged dry spell, internal conflicts, environmental degradation, crop pests and diseases, vermin and other problem animals, flooding, human epidemics and proliferation of invasive weed species arranged in their order of risk from highest to lowest with total risks of 21, 20, 18, 18, 17, 16, 14, 14, 9 and 3 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.

Myene and Aber sub-counties reported the highest vulnerability in Oyam district with cumulative vulnerabilities of 19 and 17 respectively and each with a weighted vulnerability value of 6 which lies in the middle (yellow) category of the vulnerability scale. More than 1/3 of the sub-counties displayed low (green) vulnerability with weighted vulnerabilities well below 5. Oyam T/C and Acaba sub-counties were the least vulnerable sub-counties in the district each with a weighted vulnerability value of 2.

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 Oyam District 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 Oyam 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 Oyam district is vulnerable to ten hazards, in order of decreasing risk: animal vectors and diseases, heavy storms, prolonged dry spell, internal conflicts, environmental degradation, crop pests and diseases, vermin and other problem animals, flooding, human epidemics and proliferation of invasive weed species.

Myene and Aber are the most vulnerable sub-counties each with a weighted vulnerability of 6 which lies in the middle (yellow) category of the vulnerability scale. Even when more than 1/3 of the sub-counties are in the green (low vulnerability) category, efforts should be taken to fortify them 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. Oyam T/C and Acaba sub-counties displayed the least vulnerability in the district each with a weighted vulnerability value of 2.

Timely early warning systems and other DRR interventions would be able to enhance the resilience of the people of Oyam 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, nagana, 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 Rwenzori sub-region, reducing the grazing capacity of the land.

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