THE REPUBLIC OF UGANDA

Gulu District

Hazard, Risk, and Vulnerability Profile

2016

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Acknowledgment

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

Executive Summary

This Gulu 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 Ugandan atlas of disaster risk. It will support planning and decision-making processes to manage disaster risk in the District.

The methodology provided for four phases of work:

Phase I:	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.

This report identifies 9 hazards that Gulu District is exposed to, in order of high to low risk: environmental degradation, Internal conflicts/land conflicts, bush fires, floods, prolonged dry spell, crop pests and diseases, heavy storms, animal vectors and diseases 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.

Gulu District is generally a high vulnerability District as compared to its counterparts in the region. Even though the District has no Sub-county in the “red” category, Awach is the most vulnerable Sub-county in Gulu District with a weighted vulnerability value of 7 (yellow). Most of the Sub-counties displayed medium vulnerability to the resident hazards with weighted vulnerabilities between 5 and 7. Bar-Dege, Layibi and Pece Divisions were the least vulnerable Sub-counties in the District with weighted vulnerability values of 4, 3 and 3 respectively. These Sub-counties though less vulnerable, should also 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

Timely early warning systems and other DRR interventions would enhance the resilience of the people of Gulu in their hazard and climate change situation.

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
FGD	Focus Group Discussions
GIS	Geographical Information Systems
GoU	Government of Uganda
GPS	Global Positioning System
HFA	Hyogo Framework for Action
IDP	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
NAADS	National Agricultural Advisory Services
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

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.

INTRODUCTION

Gulu District is vulnerable to a number of hazards that lead frequently to disasters. They include; Environmental Degradation, Internal Conflicts/Land conflicts, Bush Fires, Floods Prolonged dry spell, Crop Pests and Diseases, Heavy Storms, Animal Pests and Diseases Human Epidemics. The Gulu 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 analysing disaster risks and vulnerabilities in Gulu 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 Gulu District.

Methodology

The multi hazard, risk and vulnerability mapping employed a people-centred, multi-sectoral, and multi-stakeholder approach. To capture the required information for production of the District profiles, a team of four led by the Office of the Prime Minister (OPM) visited stakeholders in a field mission to Acholi region from 11th to 30th May, 2014. The team had One Disaster Preparedness Officer, One GIS Expert and two GIS Specialists. They worked in each District for an average of two days.

The field team interviewed District, Sub-county and Parish officials, and community members. They acquired secondary data through government sources (relevant Ministries, Departments, Agencies, and District Authorities in the Acholi Sub-region) and data bases from other organizations/NGOS operating in these Districts. The mapping team integrated the field data, secondary data and spatial data and analysed them to produce hazard and vulnerability maps, interpretation and conclusions in District hazard, risk and vulnerability profiles.

The District profile production process had four phases:

Phase I: Preliminary Activities

Phase II: Field Data Collection and Mapping

Phase III: Data Analysis, Map Production, Report Writing and Verification

Phase IV: Dissemination

Phase I: Preliminary Activities

Before the start of field activitythe team undertook a series of planning and preparation activities. These included meetings with relevant stakeholders, mobilization of required resources, acquisition of required equipment and materials, review of relevant literature, establishment of study contacts and preparation of a checklist of activities to be undertaken in Phase II.

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

This phase was also useful for preparing the resource deployment plan, and outlining procedural and field work plans. It articulated how various stakeholders would be consulted to ensure maximum participation in locating hazard-prone communities and other information relevant to the mapping exercise.

Phase II: Field Data Collection and Mapping

Stakeholder mapping and local meetings: The team held an entry meeting in each District to facilitate capture of key local issues related to hazard occurrence and trends. The meeting gave an opportunity for the team and stakeholders to identify other key resource persons and support staff for consultation in the local community.

Stakeholder Participation Practices: Stakeholder participation was a key component of the mapping exercise. The team consulted District Technical Sector Heads, usually members of the District Disaster Management Committee (DDMC), and involved them in the ground-truthing exercises to ensure ownership of the data and results by the District leadership. They gave stakeholders, particularly those at District level, the opportunity to validate/update the data and make useful observations and additions of any other information relevant to the mapping process.

Capture of spatial data: The mapping team acquired spatial data and digital base maps at appropriate scales. When necessary they digitized feature layers of paper maps. The base maps contained relevant feature data including terrain, District and Sub-county boundaries, forest reserves, national parks, roads, rivers, streams, water bodies and wetlands, and the locations of infrastructure, services and settlements.

Secondary data and desk research: The team reviewed relevant documents at the District Offices and other Organizations, assimilating policy and legal documents, and existing maps, development plans, reports and studies to characterize the socioeconomic and geographic nature of the District. They used a checklist which summarized the information required for each of the various risk indicators being mapped.

Critical observation and fact finding: To critically assess the conditions, nature and location of hazard prone zones, current human activities and settlement patterns in hazard prone areas, the team visited infrastructure elements, observed principal household economic activities and spot-checked the locations of map features. They took the locations of hazard instances, called “hot spots”, using a GPS receiver and used satellite imagery to validate and extend map features.

Main instruments of data collection: The main tools for data collection were methodology guidebooks, key informant guides, notebooks, GPS receivers, digital camera, document scanner, Google Earth, Satellite images and topographic sheets of the mapping areas.

Phase III: Data Analysis, Map Production, Report Writing and Verification

Analysis of collected data: The team and District Local Government Officials analysed the collected data. The mapping team added thematic layers and hazard incident points (hot spots) to the base maps to develop the hazard, risk and vulnerability maps. The main activities in this phase include:

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

Methods used for data analysis: The following data analysis methods were used:

- Scanning, geo-referencing, digitizing, geo-processing, and data transformation
- Focus group discussions and team discussions
- Drafting, digitizing and GIS overlays
- Compiling data and information

Data editing, cleaning and coding: The mapping team used the various tools mentioned above for editing, cleaning and coding. They transcribed the qualitative and quantitative data obtained from the field into spreadsheet tables using a data entry interface analogous to the field data forms. They cleaned the data by reconciling differences among the perceptions of the various stakeholders and resolving data anomalies as they edited the spreadsheet tables that listed the hazards perceived in each Sub-county. They chose coding schemes to distinguish and represent on the hazard maps the levels of risk perceived by the stakeholders.

Data analysis: After data were collected from the field, the mapping team analysed and represented them using MS Office software (MS Word and MS Excel for Windows). They analysed spatial data using ArcGIS software and mobile GIS applications, systematically overlaying hazard feature (layers) onto base maps to produce the 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, it was integrated for production of thematic maps for the various types of hazards.

Generation and verification of draft maps: The mapping team elaborated a series of hazard risk maps which reflect the severity of each hazard risk in each Sub-county, encoded as high (red), medium (yellow), low (green) , and “not reported” (clear), reflecting the perception of stakeholders. They summarized the vulnerability situation in the District on a single map by colour-coding the Sub-counties according to the sum of the Sub-county hazard risk scores divided by 3, using the following classification scheme:

Table 1: Vulnerability classification scheme

(Sum of hazard risk severities) / 3 in the Sub-county	Vulnerability	Map colour code
0	None	Clear
1 - 4	Low	Green
5 - 7	Moderate	Yellow
8 or more	High	Red

The hazard summary table ranks the hazards according to the ascending order of the values of the sum of Sub-county hazard risk scores for each hazard.

Several weeks later, the team returned to the region to present the draft District Hazard, Risk and Vulnerability Profiles in a verification workshop. They invited stakeholders to assess the maps' accuracy and completeness, identify errors and gaps, and provide correct information to be incorporated in the final map versions.

Phase IV: Dissemination Workshop

After publication of the set of the District hazard, risk, and vulnerability profiles of the region, OPM staff led a final workshop to dissemination them and promote awareness of their usefulness to Local Partners.

Overview of the District

Location

PHYSICAL DESCRI PTI ON

Geographical Location and Size of Gulu District

Gulu District is located in Northern Uganda between longitude 30-32 degrees East; latitude 02-4 degrees North (figure 1).

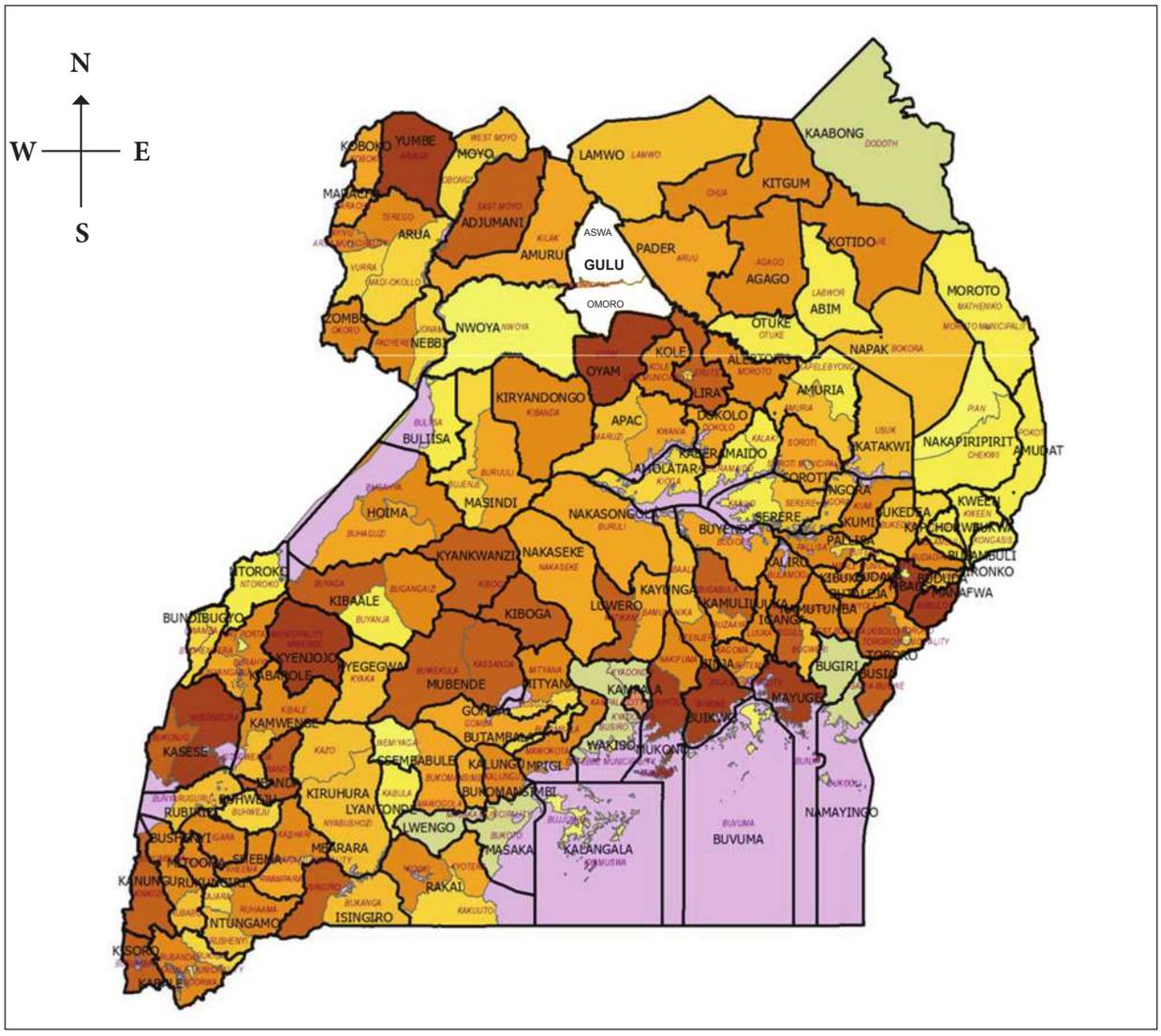

Figure 1: Map of Uganda showing location of Gulu District

It is bordered by Amuru and Nwoya District in the West and Southwest respectively, Lamwo District in the North East, Pader District in the East, Lira District in the South East and Oyam District in the South

The total land area of Gulu District is 3,449.08 km^2 (1.44% of the Uganda land size). 96.9 km^2 (0.8%) is open waters. The District headquarters is 332 km by road from Kampala and through the Great North Road gives access to the Sudan and Democratic Republic of Congo.

Overview

Brief District history

Gulu District is one of the colonial District administrative divisions form with administrative function in the greater North from 1909 and became Acholi District in 1911.In 1974 it became west Acholi and Gulu. Its Headquarters is located in Gulu Municipal. Gulu District was formerly known as West Acholi and out of it Amuru District which later seceded into Amuru and Nwoya Districts.

Relevant cultural and ethnic issues

The District is predominantly Acholi and Lango but with many other tribes. The major spoken languages are Luo, English and Kiswahili.

Environmental issues

Topography The relief of Gulu consists of complex low landscape with relatively uniform topography marked by few sharp contrasts like Oroko and Ajulu hills to the North, Ayamo, Awere and Omoro hills in the east (Omoro County). Generally, the altitude ranges between 1000 -1200 meters above sea level.

Soils According to Langland (1974) classifications, the soil of Gulu consists of ferruginous soil with a high percentage of sandy soils and therefore susceptible to erosion. Due to its sandy nature, the soil has low water retention capacity and high rate of water infiltration. The soils are usually deep with little differentiation into clearly defined zones and possess fine granular structure, others moulded into large, weak coherent clods that are very porous. Gulu District is endowed with vast fertile soils like in Orapwoyo in Odek and Adak in Lalogi and this has resulted to very high crop yield.

Hydrology The up and down wrapping of underground rocks accompanied by faulting, shearing and jointing has influenced the drainage pattern in the District to form a dendrite drainage pattern. Here many rivers and streams are held responsible for the formation of this drainage pattern. The major ones are those flowing into the Nile, which include rivers: Aswa, Unyama, and Tochi.

Climate The type of climate experienced in Gulu consists of dry and wet seasons. The average total rainfall received is 1,500 mm per annum with the monthly average rainfall varying between 1.4 mm in January and 230 mm in August.

Normally the wet season extends from April to November with the highest peaks during May, August and October, while the dry season begins in November and extends up to March. The average maximum temperature is 50 degrees centigrade and the minimum being 18 degrees centigrade. Relative humidity is high during the wet season and low in the dry season.

Vegetation The vegetation of Gulu as classified by Langland (1974) consists of intermediate Savannah grassland. This type of vegetation is that found between the moist and the dry Savannah. The vegetation type is characterized by open canopy of trees of 10-12 meters

high and underlying grasses of 80 centimetres high. The trees are fire resistant and are therefore able to regenerate themselves after being burnt with fire. The common tree species here include; Acacia, Ficus Natalensis, Contyetum, Banasus, Aethicpum (Fanpalm) while the common grasses include; Imperata cylindrica, Hypemaria rufa, Digitria scalarum. There are also some herbs like Bidens pilosa, Ageralum coinzolds, Amaranthus species and Lantana camara.

However, man's activities have tended to interfere with the natural vegetation of the place and this has led to the development of secondary vegetation. The common tree and grass species here include Eucalyptus, Jacaranda, Cupressus, Theruvaian, Pines, Hibiscus, Bougain vilae and Flamboyant

Mineral resources the major rock types that form the geology of the District are composed of remnants of low surfaces and scarps related to rift and sediments of the western rift valley. Often, focus in these areas is zone of Tors and Inselbergs. Limited reconnaissance and geological investigations were carried out in some parts of the District and some minerals were found to occur. Chalcopyrite copper mineral is found to occur in granitic gneisses at Lawiyadul area 10 kilometres North of Gulu town. Clay suitable for good quality roofing tiles and bricks are found to occur in almost all parts of the District. Stone quarry, several rocks have been identified to have good quality for building and construction industries.

Demographics

Table 2: Projected 2012 Population of Gulu District

County	Sub-county	Population as of 2002			Population projection as of June 2010		
		Male	Female	Total	Male	Female	TTotal
ASWA	Awach	5,367	5,793	11,160	6,800	7,300	14,100
	Bungatira	11,188	11,725	22,913	14,100	14,600	28,700
	Paicho and Unyama	12,255	12,621	24,876	15,400	15,800	31,200
	Palaro	3,387	3,222	6,609	4,300	4,000	8,300
	Patiko	3,915	4,434	8,349	4,900	5,600	10,500
	Sub-Total	**36,112**	**37,795**	**73,907**	**45,500**	**47,300**	**92,800**
Municipality	Bar-dege	18,702	17,955	36,657	23,500	22,500	46,000
	Laroo	10,380	10,834	21,214	13,100	13,600	26,700
	Layibi	12,516	12,910	25,426	15,800	16,200	32,000
	Pece	17,425	18,708	36,133	21,900	23,300	45,200
	Sub-Total	**59,023**	**60,407**	**119,430**	**74,300**	**75,600**	**49,900**
OMORO	Bobi	8,375	8,345	16,720	10,500	10,400	20,900
	Koro	8,886	9,265	18,151	11,200	11,600	22,800
	Lakwana	6,431	6,957	13,388	8,100	8,700	16,800
	Lalogi	8,849	9,467	18,316	11,100	11,900	23,000
	Odek	11,908	12,347	24,255	15,000	15,500	30,500
	Ongako	7,166	7,194	14,360	9,000	9,000	18,000
	Sub-Total	**51,615**	**53,575**	**105,190**	**64,900**	**67,100**	**132,000**
Gulu District	**Grand Total**	**146,750**	**151,777**	**298,527**	**184,700**	**190,000**	**374,700**

Source: Gulu District Planning Unit & UBOS

Assessing Table 2 & 3

Gulu Municipality has the largest population (149,900) compared to Aswa (92,800) and Omoro (132,000) Counties. The projection is based on the 2002 Population and Housing Census when over 40 percent of the District population had moved into the Municipality and the rest lived in IDP camps where there was relative security.

Demographic structure

Over fifty four percent (54.6%) of the District population are young people less than 18years. The below indicates the population age structure and projections for the last 6years. It can also be observed that the number of persons between 0-4 years is higher than other age groups. The population age structure has a wide base and a thin top (a pyramidal-like shape).

Table 3: Population projections according to age distribution

Age	Base Year- 2002	2007	2008	2009	2010	2011	2012
0-4	55570	63900	65800	61700	66815	71830	73864
9-14	47931	55100	56800	58400	62835	61956	63710
14-15	39925	45900	47300	48600	52288	51608	53069
15-19	33362	38300	39500	40600	43669	43124	44345
20-24	27650	31800	32800	33700	36275	35728	36735
25-29	23668	27200	28000	28800	30966	30588	31452
30-34	18713	21500	22200	22800	24544	24192	24877
35-39	12630	14500	15000	15400	16585	16324	16785
40-44	9913	11400	11700	12100	12994	12812	13175
45-49	7072	8100	8400	8600	9264	9136	9392
50-54	5875	6800	7000	7200	7763	7588	7803
55-59	4032	4600	4800	4900	5284	5208	5354
60+	12186	13800	14400	14600	15707	15506	15939
TOTAL	**298,527**	**342,900**	**353,665**	**357,400**	**374,700**	**385,600**	**396,300**

Source: Gulu District Planning Unit & UBOS, 2010.

Table 4: The Major Tribes and Languages Spoken in Gulu District

Tribe	%	Language
Acholi	80	Luo (Acholi)
Lango	17	Luo (Lango)
Others	3	Others

Economic Activities

Agriculture

Crop production is the major economic activity in Gulu, employing about 95% of the population. Arable land is very fertile and makes up 87.4 percent of the total land area. However, less than 15 percent of land is utilized yearly. The limited utilization of land was as a result of the insurgency that had rocked the sub-region over two decades. It was estimated that 80% of farming families had been unable to produce due to displacement, and the average household production reduced in the past 13 years

Traditional cash crops are cotton and tobacco; but due to decreasing prices and limited access to markets, these have declined rapidly in the last 30 years. Production of other cash crops like rice, groundnuts, simsim and millet has however increased over the recent years. Major food crops are maize, rice, finger millet, sorghum, sweet potatoes, cassava, groundnuts, simsim, beans, peas and sunflower.

Livestock

Before 1986, livestock used to rank high on the list of assets and economic activities in the District. It was the key source of school fees, security of family welfare and source of protein. Furthermore, ox-ploughing was a vital part of crop production. With the cattle rustling that occurred between 1986 and 1988, the economic vulnerability of the population worsened considerably. At present, there are only approximately100 dairy farmers in the District.

Fisheries

Fishery activity is limited in Gulu. The District is devoid of large water bodies, except for the small rivers, streams and swamps such as Aswa, Torchi, Unyama, etc. Fish is instead supplied from other sources outside the District, namely Lake Kyoga, Lake Albert and as far as Lake Victoria. Before the displacement of people into the IDPs between 1997 and 2007, fish farming was a widespread activity. Gulu District Council is currently exploring the possibility of revitalizing this source of income.

Commercial Activities

Economic activity is basically agriculture and other related services like agro-marketing and agro-processing. There are also trade, tourism and limited services in transportation, education and health. Major farming is under Cooperative Societies in dairy, SACCOs and unions while there's tare Producer & Marketing societies of various crops like cotton and tobacco.

Livelihood Analysis

Access to livelihood resources differ markedly between communities, households and individuals, with female headed households having the least access. These variations influence the livelihood.

The private sector in Gulu consists of minor micro and small enterprises. Gulu is thus among the Districts in Uganda with the least number of industries. Only a few grinding mills and rice hullers, garages, wood and mental workshops and the construction industry are present. Accordingtothe2002PopulationandHousingCensus, only 0.4 percent of Gulu population is engaged in cottage industry as their source of livelihood

Another 17.4 percent make their primary source of living from employment income. While some people in formal employment do work in the micro and small-scale enterprise sector, most of these are government employees or are attached to the few parastatal bodies and private sectors represented in Gulu, such as the Post Office, Telecommunication Services, Microfinance and Hotels Services, National Water & Sewerage Corporation, Umeme

(power supply), Commercial Banks and NGOs.

The main source of household livelihood in general is subsistence farming (57.8percent) followed by earned income (17.4percent).

Table 5: Main source of livelihood in Gulu, 2002

Main source of Livelihood	House-holds	% of Household	Population
Subsistence farming	33,830	57.8	172,549
Cottage industry	238	0.4	1,194
Employment income	10,197	17.4	51,943
Business enterprise	4,064	7.0	20,897
Others	10,206	17.4	51,944
Total	**58,535**	**100.0**	**298,527**

Source: 2002 Population and Housing Census

The table below shows that while subsistence farming was more predominant in the rural areas (88.2%), less than two-fifths (39.3%) of the households in the urban areas depended employment income.

Table 6: Main source of household livelihood by County

Counties	Subsistence farming	Employment income	Business enterprise	Cottage industry
Aswa	33.4	9.2	7.0	9.2
Gulu Municipality	11.8	83.7	88.8	79.4
Omoro	54.8	7.1	4.2	11.3
Total	100.0	100.0	100.0	100.0

Source:2002 population and housing census

The data in the tables below originate from 2002 Population and Housing survey. Since that year significant structural changes have however taken place in the District.

HAZARDS

Table 7: Hazard Summary

Hazard	Status	Sub County	Rank
Heavy Storms	Incidences of strong winds, hailstorm and lightning reported. Roofs of Ongako H/C II; Lakwana/Bungatira S/C Hqters; Laroo Division Staff residential house all blown off and two students struck dead in Pece Stadium; crops were destroyed by hailstones as well.	Paicho, Pece Div, Ongako, Lakwana(Lakwana PS, Sub county HQ ,Laroo and Bardege Div, Awach, and Bobi Sub Counties	**7**
Crop Pests and Diseases	Incidences of Beatles eating leaves of beans reported	Lakwana and Lalogi	**6**
	Aphids eating soya beans, millet and ground nuts at germination stage reported	Odek Sub County	
	Incidences of Cassava Brown Streak reported	Awach	
	Incidences of G/Nut Rossette reported	All Sub Counties	
	Incidences of Cassava Mosaic reported	All Sub Counties with Awach and Patiko most affected	
	Incidences of grass hoppers reported	Patiko S/C	
	Incidences of Banana Bacterial wilt reported	Ongako, Bobi, Bungatira, Paicho, Laroo Div, Bar Dege Div, Pece Div and Layibi Div	
	Citrus Kankas and Fruit Flies reported	Lalogi Sub County	
Animal Vectors and Diseases	Incidences of African Swine Fever reported	All Sub Counties and Divisions	**8**
	Incidences of Foot and Mouth Disease reported	Odek Sub County (Quarantine now lifted)	
	Incidences of New Castle Disease among chicken reported between November and January	All Sub Counties and Divisions	
	Incidences of Tsetse Flies reported	All Sub Counties and Divisions	
	Incidences of Nagana reported	All Sub Counties and Divisions	
	Cases of rabies reported	Palaro	
Environmental Degradation	Incidences of Wetland Encroachment, Deforestation, reported. Deforestation is for charcoal and timber while wetland degradation is in form of encroachment, dumping of non-biodegradable wastes and grazing.	Pece, Layibi, Laroo and Bar Dege Divisions; Unyama, Ongako, Koro and Awach Sub Counties, Lakwana Tegot and Lujorongole Parish.	**1**

Internal Conflicts	Incidences of Land disputes intra and inter community reported.	All Sub Counties and Divisions	**2**
	Incidences of Boarder Disputes reported	Gulu Vs Amuru Districts in Palaro S/C	
	Incidences of Government institutions like schools, Livestock holding ground for Veterinary Department in Opit and Opit Central Forest Reserve are being encroached on.	Ongako, Bungatira, Lalogi in Jaka parish Kona Agula village Odek in Lamola Parish in Aromo Wanglobo, Palaro, Koro Kal parish in rom village, and Paicho in Kal umu, Unyama in Angaya parish Palaro in Mede Parish in Oroko and Owalo Sub Counties	
	Inter clan conflict reported where one lady was killed and houses were burnt	Lalogi Lalogi in Jaka parish Kona Agula village Odek in Lamola Parish in Aromo Wanglobo.	
Prolonged dry spell	These are common phenomena in the District leading to failure of the first planting season. The most affected crops are G/nuts, Maize and Beans	All Sub Counties and Divisions Lakwana Tegot, Paicho Omel, Patiko Kal Parish, Palaro Te-Ladwong and Awal-Aboro,	**5**
Human Epidemic	Incidences of Hepatitis B reported with prevalence rate of 20-30%	All Sub Counties and Divisions	**9**
	Outbreak of Ebola reported	Patiko, Ongako Sub Counties and Bar Dege Division	
	Neglected Tropical Diseases (River Blindness, Filariasis, Bilharzia and Trachoma)	All Sub Counties and Divisions	
	Invasion of schools and health centers by bats, which are known for carrying Marburg and Ebola	Lalogi Lamin onami P7.Sub County	
Floods	Incidences of floods reported. Several bridges and culvert crossing points have been washed away; several pit latrines collapsed in the communities reducing the latrine coverage considerably.	Odek Binya parish Te aceng Aswa river and Odek river Unyama Lalingolingo and Abera streams, Paicho, Awach, Palaro, Patiko, Lakwana Lujorongole parish,lagwedola Village, Tegot Parish all villages,Parak Parish Olula village, Lanenober Parish inAcut oyeng and Keto Village., Lalogi and Koro Sub Counties	**4**
Bush Fires	Incidences of massive fires reported. The practice is orchestrated by the communities around the CFRs of Abera and Opit. The fires severely destroy the forests	All the sub counties	**3**

Hazard Risk Assessment

Table 8 expresses the communities' assessment of severity and likelihood of risk in their respective Sub-counties. Each of the columns in table 8 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 8: Summary of Hazards by Sub-county

Sub county	Hazards								
	Heavy Storms	Crop Pests and Diseases	Animal Vectors and Diseases	Environmental Degradation	Internal Conflicts/Land conflicts.	Prolonged dry spell	Human Epidemics	Floods	Bush Fires
Palaro	L	L	L	H	H	M	L	M	H
Patiko	L	M	M	H	H	M	L	M	H
Awach	L	M	M	H	H	M	L	H	H
Bungatira	L	M	M	H	H	M	L	M	H
Paicho	L	L	M	H	H	M	M	M	H
Unyama	L	L	L	H	H	M	L	M	L
Bar-Dege Div	L	L	L	H	M	N	L	L	N
Layibi Div	L	L	L	H	M	N	L	L	N
Pece Div	L	L	L	H	M	N	L	L	N
Laroo	L	L	L	H	M	N	L	M	N
Ongako	M	L	L	M	H	M	L	L	M
Koro	M	L	L	H	H	M	L	L	M
Lalogi	L	L	L	H	H	M	L	L	H
Odek	M	M	L	H	H	M	M	L	H
Lakwana	M	M	L	H	H	M	L	L	M
Bobi	M	M	L	H	H	M	L	M	M
Key: H = High, M = Medium, L = Low, N = Not reported									

Risks

In Gulu the following hazards are presented as below according to their level of importance namely; Environmental Degradation, Internal Conflicts/Land conflicts, Bush Fires, Floods Prolonged dry spell, Crop Pests and Diseases, Heavy Storms, Animal Pests and Diseases and Human Epidemics.

Environmental Degradation

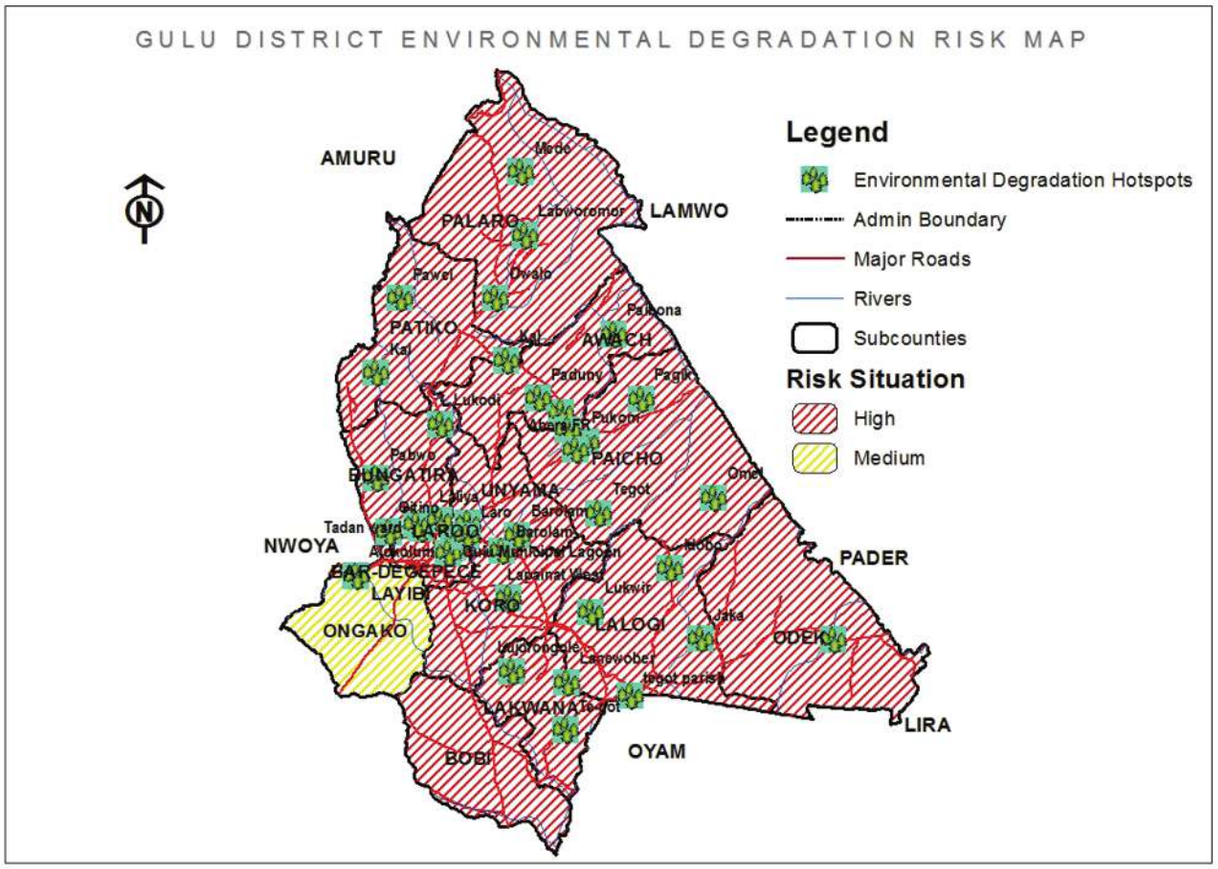

Figure 2 Environmental Degradation Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Environmental degradation refers to the deterioration of the natural environment, including the atmosphere, bodies of water, soil, and forests. In Gulu it is one of the factors that contribute to poverty. In many parts of Gulu District, environmental degradation has led to shortages of food, clean water, materials for shelter, and other essential resources. As forests, land, air, and water are degraded, people who live directly off these natural resources suffer most from the effects. People in Gulu do not have the appropriate technologies, such as air and water filters, refined fuels, and industrially produced and stored foods to buffer themselves from the effects of environmental degradation.

In Gulu, environmental degradation results from a variety of factors, including fast increasing population and the resulting overuse of land and other resources. Poor methods of farming for instance deplete soil fertility, thus decreasing crop yields. Environmental degradation also results from pollution especially of water and air

In Gulu District, deforestation has had particularly devastating environmental effects and many of the rural people, particularly in Palaro, Patiko, Awach, Bungatira, Paicho, Unyama, Ongako, Koro, Lalogi, Lakwana, Odek and Bobisub counties depend on forests as a source of food, fuel , building materials and charcoal for income and other resources, and deforestation damages or eliminates these supplies. Forests also absorb many pollutants and water from extended rains; without forests, pollution increases and massive flooding further decreases the usability of the deforested areas. Bush burning is also experienced in all the sub counties in the dry season. Another aspect of degradation is in appropriate waste disposal which is more prominent within the divisions in the municipality. This is characterized by uncontrolled, unmanaged open dumping of waste material and refuse this occurrence is common in Pece, Layibi Bar-Dege and Laroo. Wet land encroachment is vivid in all the divisions along Pece stream, Layibi stream and Oitino.

Internal Conflicts/Land conflicts

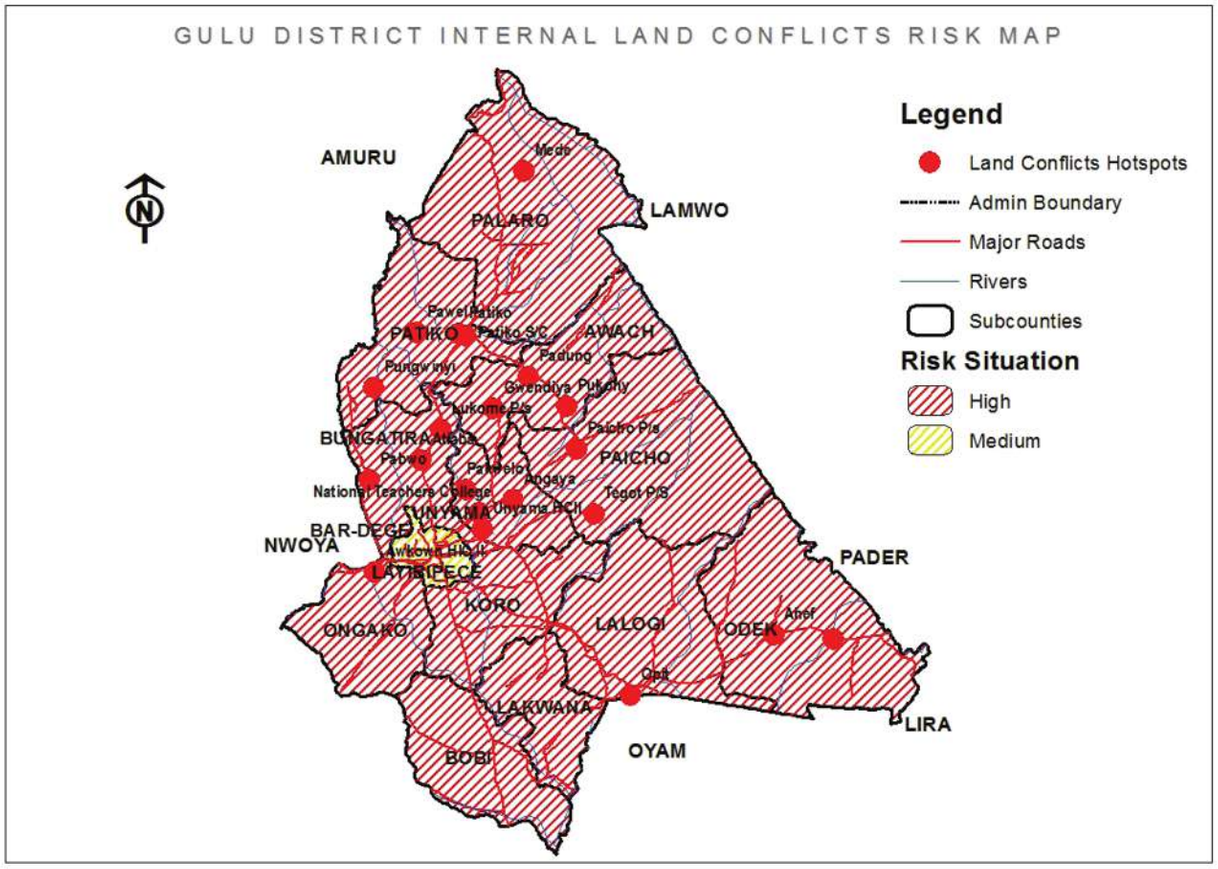

Figure 3 Internal Conflicts/Land conflicts Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Gulu District and her people inherited the legacy of a two decade political instability characterized by a civil war and long encampment. In 2006, the camp phase off exercise begun with a slogan “return where the war got you” which unfortunately was misunderstood by many leading a lot of internal land conflict.

The creation of new administrative units was not only positive by way of jobcreation and extending services close to the people but also resulted to a lot of boundary disputes between Districts and sub counties.These disputes are as follows;

1. The Dispute between Gulu and Amuru Districts; The administrative boundary map shows that the villages of Gwayi, Oroko, Pwomunu & part of Mede which have since been served by Gulu District are in Atiak. Many attempts have been taken to solve the conflict but with no successful end. This conflicts has now degenerated in to a struggle between two clans (Atiak and Palaro)

2. The Dispute between Gulu and Nwoya Districts; The conflict started between Orum Village in Goma and Koro Bar in Bobi. It started as households' conflict and graduated to administrative boundary level. To resolve this, Leaders of the two Districts got together to resolve the conflict which resulted into Gulu letting go of the area to Nwoya after verification of the administrative boundary.

3. The Dispute between Gulu and Oyam Districts; Naming of places that carry tribal sentiments and therefore affecting relationships. Struggle over Malaba Market between Odek and Aromo Sub-county.

4. The Dispute between Gulu and Lira Districts; Awali Wang Lobo and Aromo Wang Lobo Conflict.

Apart from the inter District boundary conflicts above, Acoli Sub region District are consumed into a number of intra District boundary conflict especially between Sub-counties, parishes and Villages which has resulted into lack of appropriate service delivery in the affected areas.

All the above conflicts have been magnified by increased land sales, weak and ill-facilitated land conflict resolution institutions like the LCs, Traditional institutions (Ker Kwaro) and ignorance of the land laws in the District.

Bush Fires

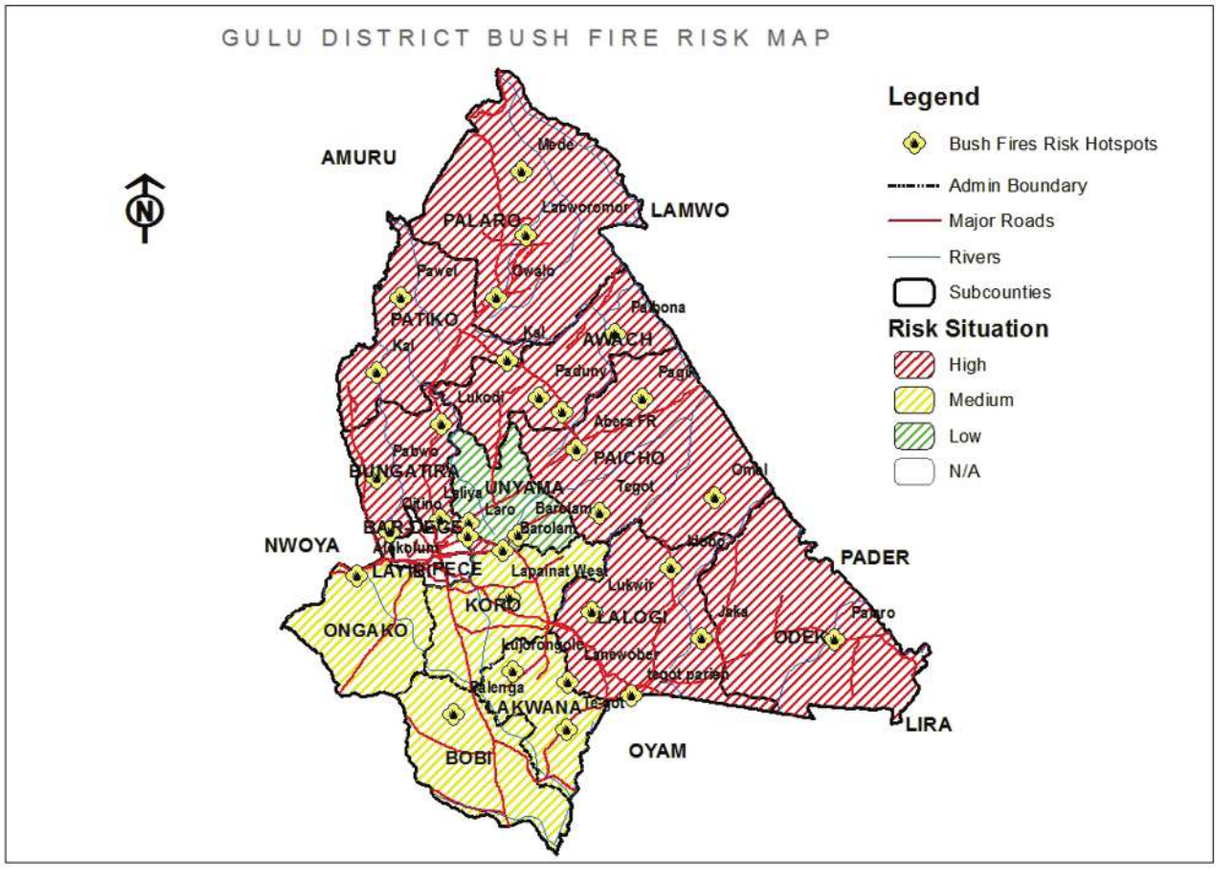

Figure 4 Bush Fires Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Bush fires occur in most of the rural areas of Gulu District and are fueled by forest or grassland vegetation. Small-scale, periodic Bush fires can actually improve the health, resilience, and productivity of an ecosystem. When these fires do not occur often enough, however, flammable vegetation can build up, leading to a large-scale fire that harms plant and animal species some time in more than one Sub County. In Gulu District the leading causes of bush fires are human-caused ignitions, including those from abandoned fires by hunters, cigarettes, unmanaged bush clearance for farming and arson. Such fires destroy forested areas, crops as well as homes and property bordering these areas. All the sub counties of Gulu Districts suffer from this hazard yearly during the dry season.

Floods

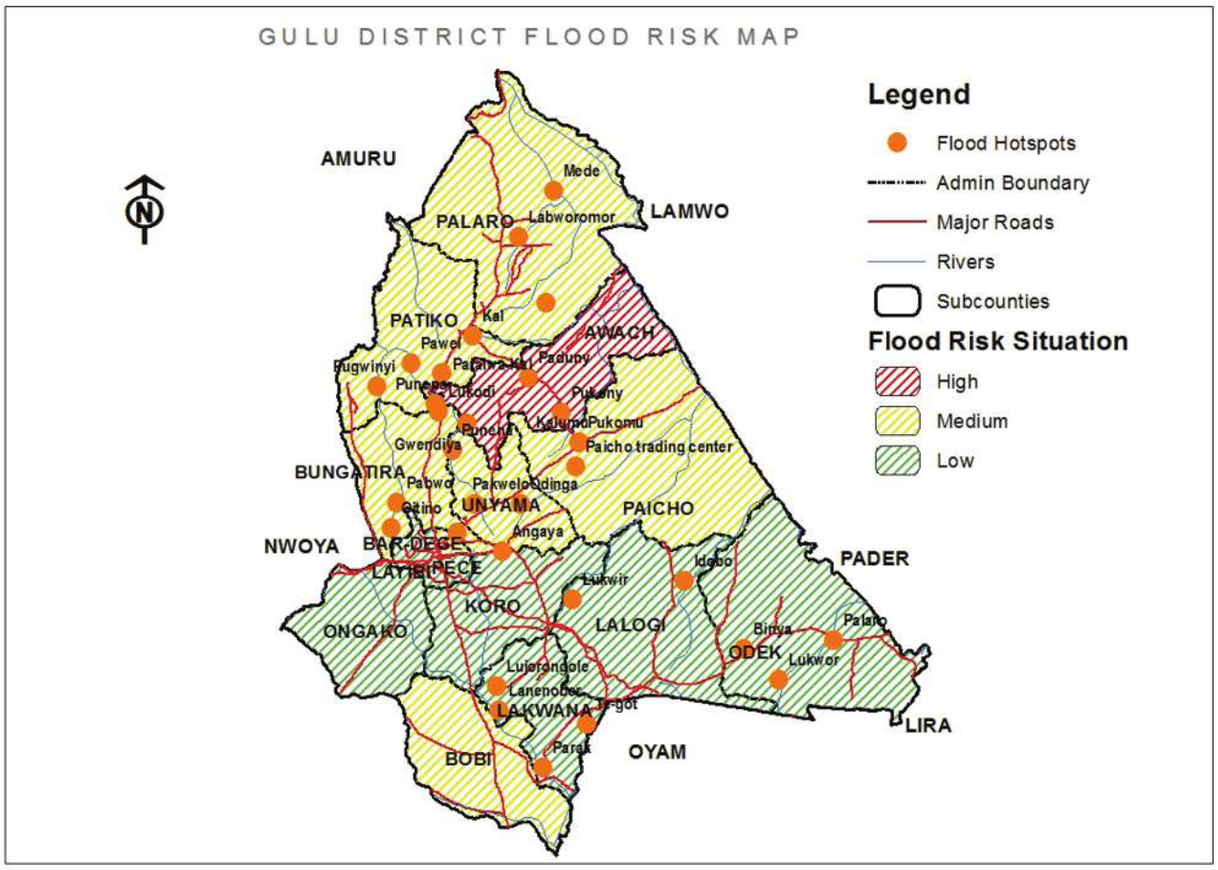

Figure 5 Floods Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Most streams and river in Gulu District burst their banks during the wet season. In the Municipality, Pece wetland, Layibi and Oitino wetland over floods during rainy seasons. Tochi River, Unyama Odek, and Aswa always burst their banks in the rainy season. Soils in certain seasonally dry areas are heavy and have a high clay content. The clay in these areas expands when it is wet, then shrinks and cracks when dried. These soils are associated with river floodplains and in the flat areas like Te-Ladwong in Palaro, Awoo-nyim in Patiko and Paibona and Pukony in Awach, Lagwedola in Lujorongole parish in Lakwana Sub County there is constant water logging during the wet season.The result of this has led to road destruction. Ocim road had the bridge washed away, in Bungatira, during rainy season Gulu Patiko road at Lukodi becomes impassable. Kulu keno and Oitino floods during wet season.

Prolonged Dry Spell

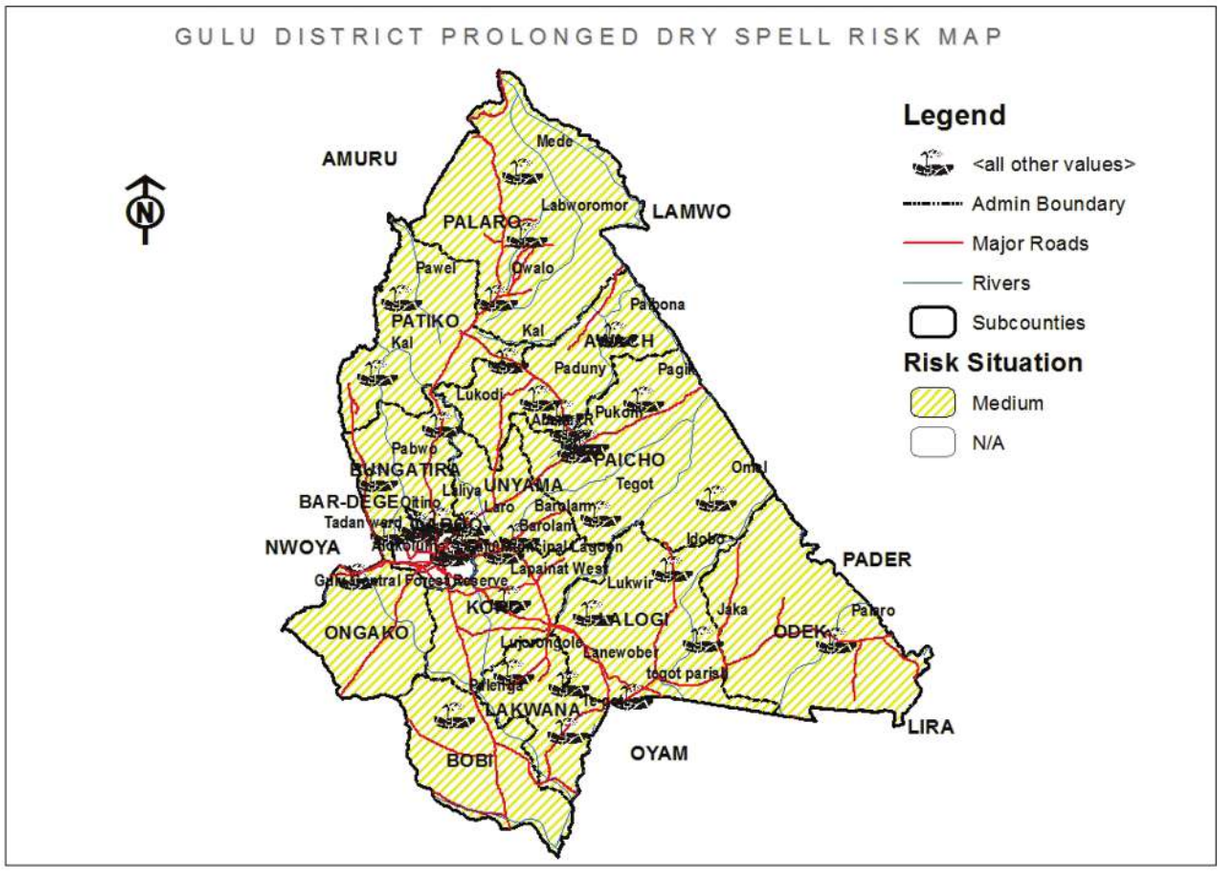

Figure 6 Prolonged Dry Spell Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Prolonged dry spell is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance. This results into empty Water-supply reservoirs, wells streams and rivers dry up, and crop damage ensues. The severity of the drought is gauged by the degree of moisture deficiency, its duration, and the size of the area affected. If the drought is brief, it is known as a dry spell, or partial drought. A partial drought is usually defined as more than 14 days without appreciable precipitation, whereas a drought may last for years. In Gulu District, Omel in Paicho, Kal in Patiko, Te-Ladwong and Awal-Aboro in Palaro, Tegot parish around Moro hill and Lalogi in Loyo ajonga and Minja suffer from longer dry spell than those from the other part of the District.

Crop Pests and Diseases

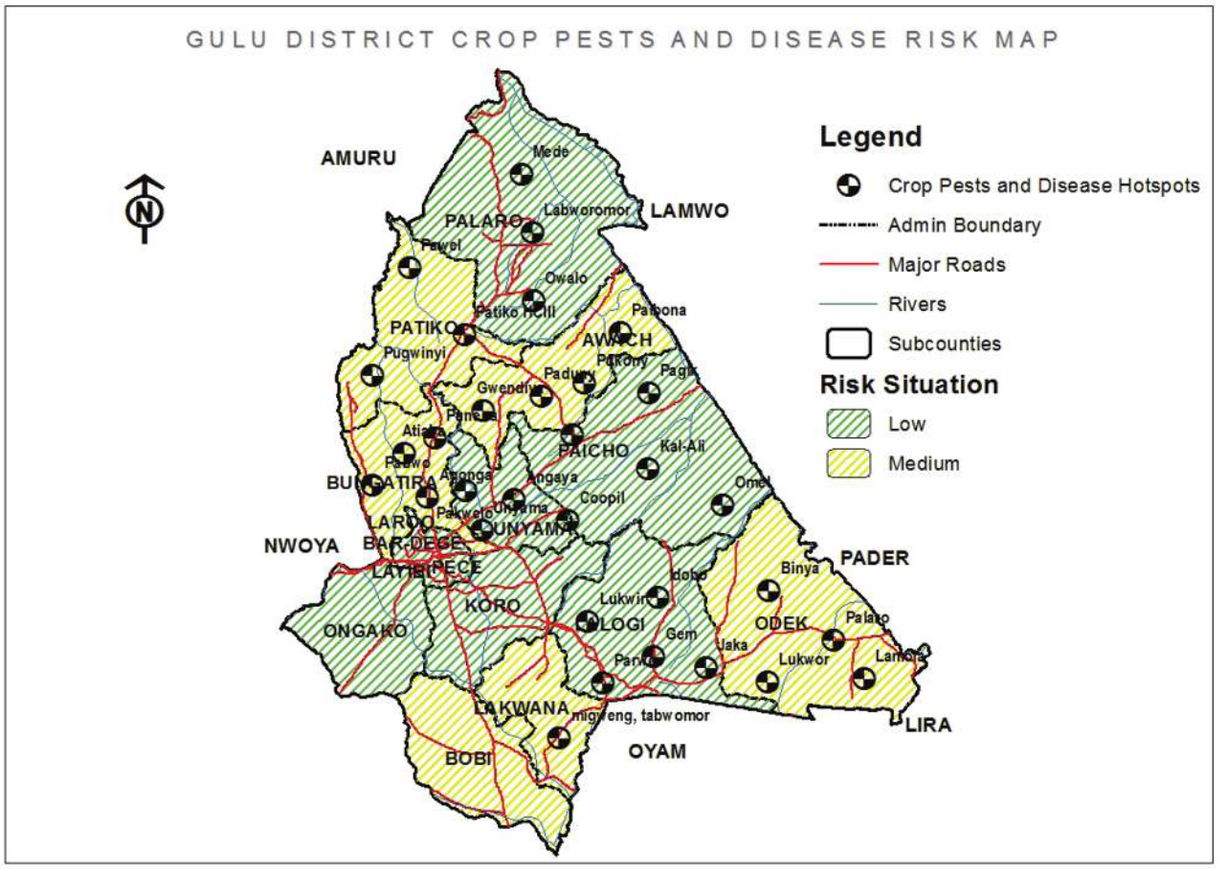

Figure 7 Crop Pests and Diseases Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Incidences of Beatles eating leaves of beans reported in Lakwana and Lalogi, Aphids eating soya beans, millet and ground nuts at germination stage reported inOdek Sub County, Incidences of Cassava Brown Streak reported in Awach, Incidences of G/Nut Rossette reported in all Sub Counties, Incidences of Cassava Mosaic reported in All Sub Counties with Awach and Patiko most affected, Incidences of grass hoppers reported in Patiko S/C , Banana Bacterial wilt reported in Ongako, Bobi, Bungatira, Paicho, Laroo, Bar Dege, Pece and Layibi Division, Citrus Kankas and Fruit Flies reported in Lalogi Sub County. In Unyama Glow worm was reported to affect crops during April and may across all the parishes.

Heavy Storms

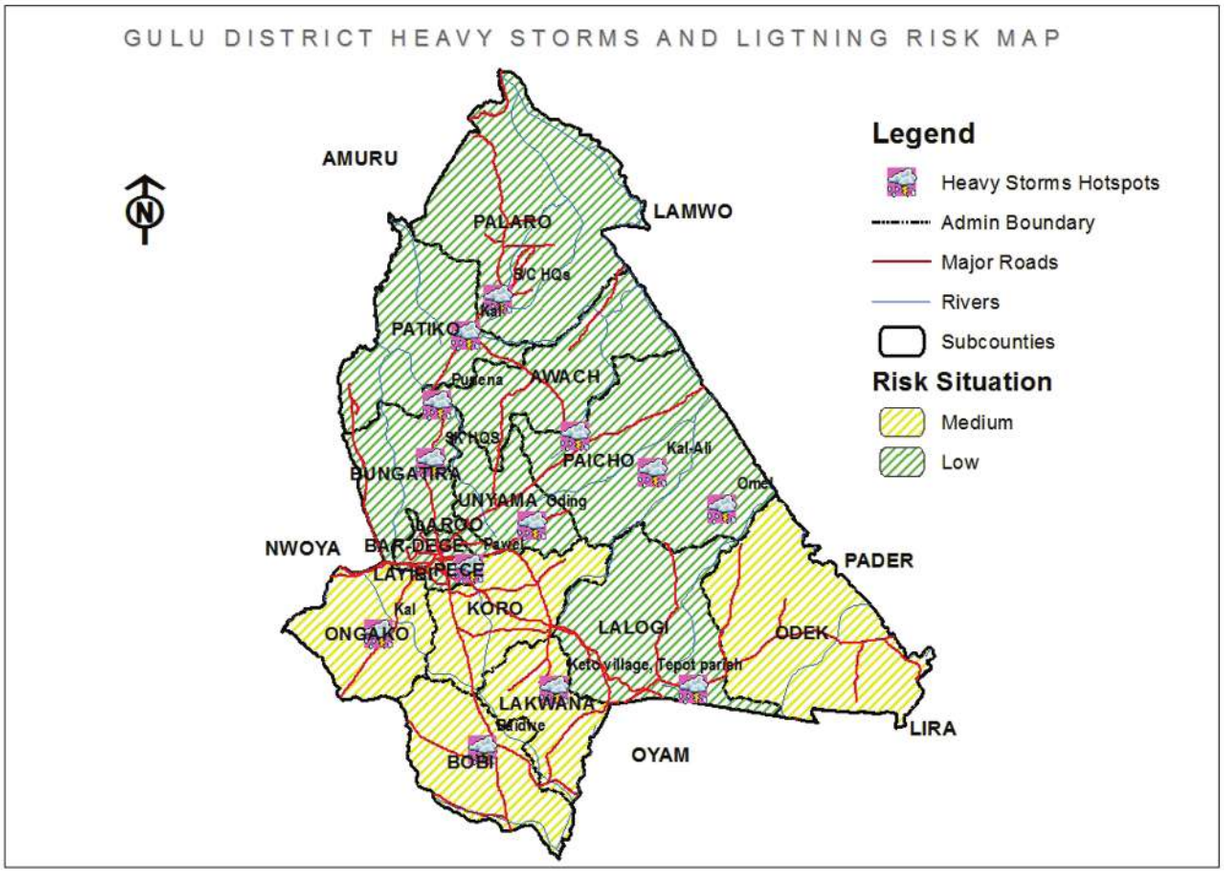

Figure 8 Heavy Storms Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Incidences of strong winds, hailstorm and lightning reported. Roofs of Ongako H/C II; Lakwana/Bungatira S/C Headquarters; Laroo Division Staff residential house all blown off and two students struck dead in Pece Stadium; crops were destroyed by hailstones as well. In Awach, Palaro Patiko large farm lands were destroyed in November, 2014 by hailstorm.

Animal Vectors and Diseases

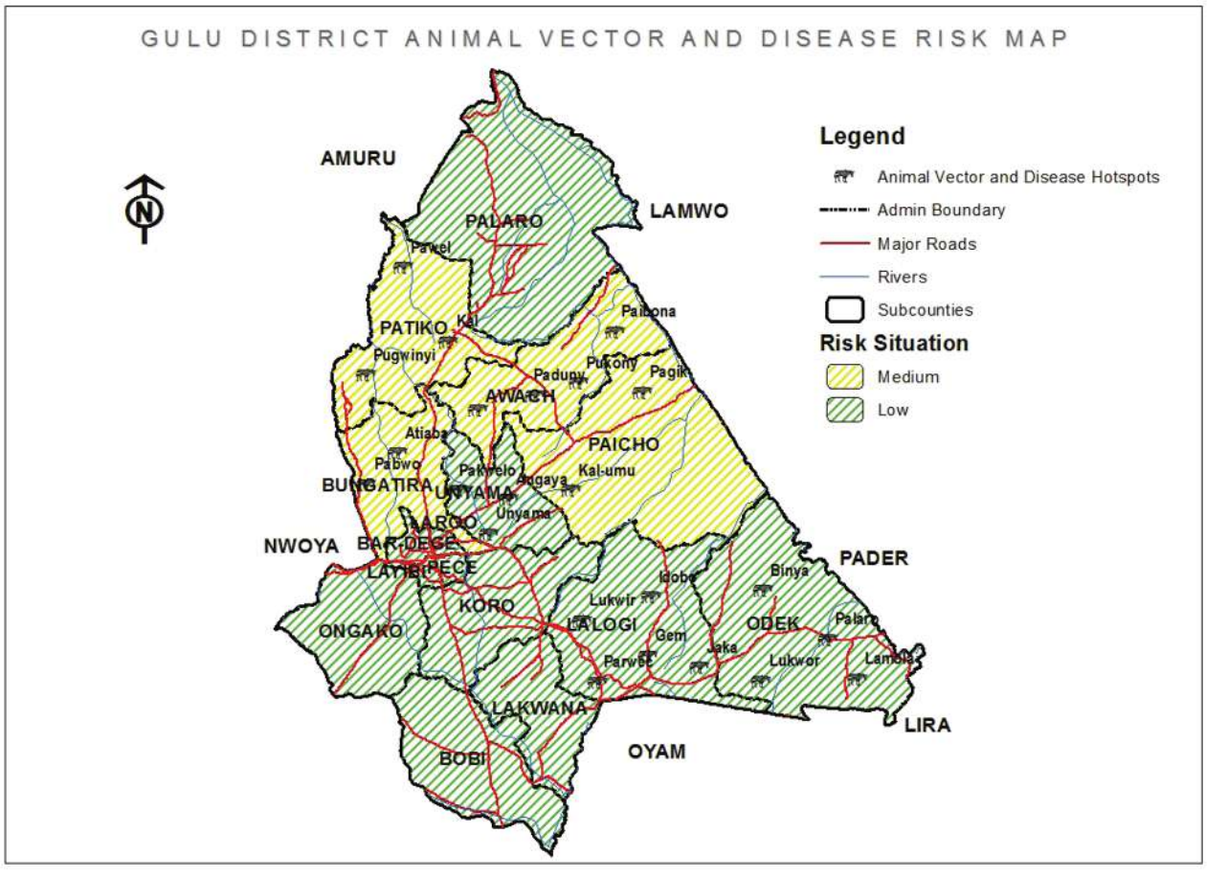

Figure 9 Animal Vectors and Diseases Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Incidences of African swine fever reported in All Sub Counties and Divisions, Incidences of Foot and Mouth Disease reported especially in Odek and Paicho. This arises from infections from the neighbouring Districts of lira and Pader.

Incidences of New Castle Disease among chicken reported between November and January, mostly hit all the divisions of the municipality.

Incidences of Tsetse Flies and Nagana reported mostly in the all the sub counties bordering Aswa, Unyama, and Tochi rivers

Cases of rabies reported in Palaro Sub County.

Human Epidemics

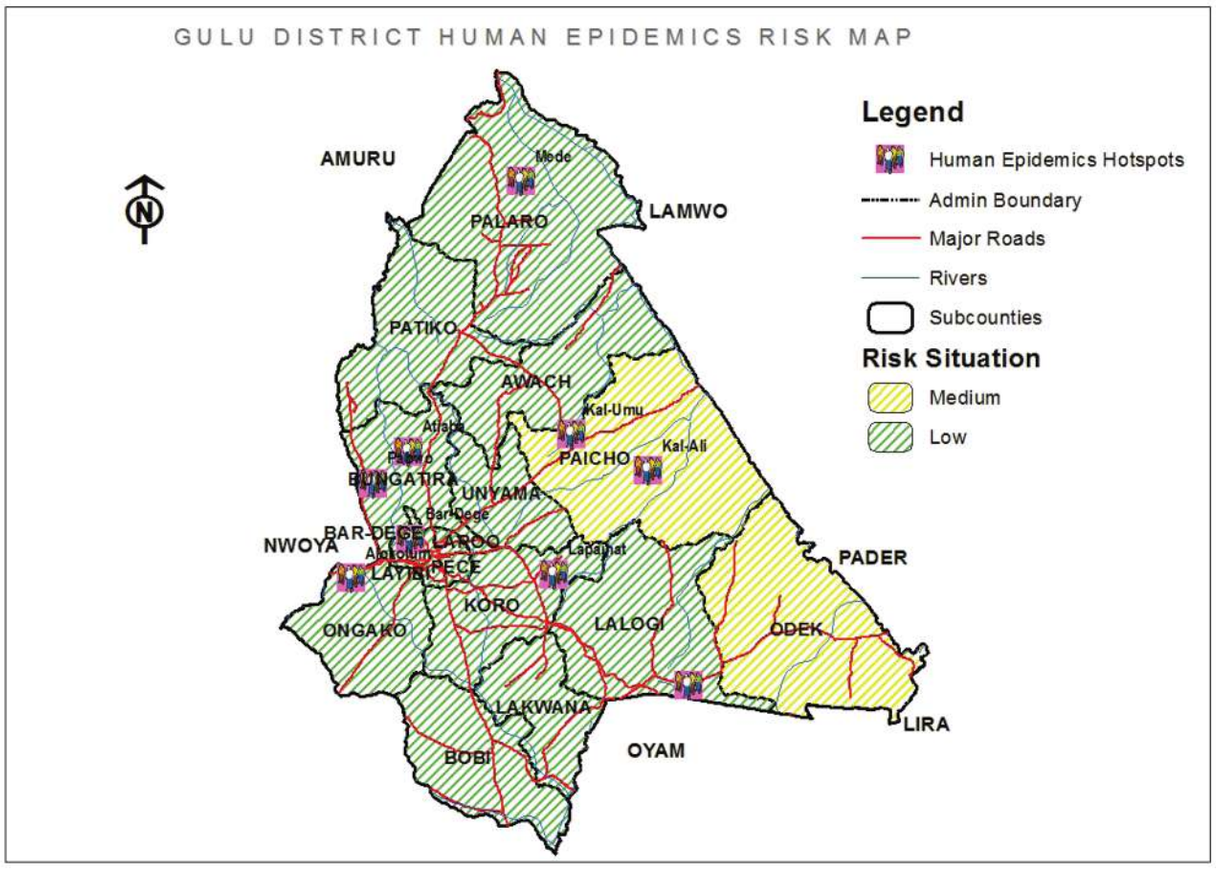

Figure 10 Human Epidemic Risk Map

Source: Field Data Collected by OPM (Sept. 2014)

Incidences of Hepatitis B reported with prevalence rate of 20-30% across the District.

Outbreak of Ebola reported in Patiko in Rwot obilo In 2001 and was declared Ebola free.

Neglected Tropical Diseases (River Blindness, Filariasis, Bilharzia and Trachoma) across the District.

Invasion of schools and health centres by bats, which are known for carrying Marburg and Ebola in Lalogi at Lamin onami.

Nodding syndrome was reported in Odek and Paicho especially those areas close to river Aswa.

VULNERABILITY

Table 8 summarizes the communities' assessment of hazard severity and frequency in the sun-counties. Table 9 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 9: Risk and vulnerability assessment

Sub county	Hazards									Cumulative vulnerability (Absolute)	Weighted vulnerability (Cumulative/3)
	Heavy Storms	Crop Pests and Diseases	Animal Vectors and Diseases	Environmental Degradation	Internal Conflicts/Land conflicts.	Prolonged dry spell	Human Epidemics	Floods	Bush Fires		
Awach	1	2	2	3	3	2	1	3	3	20	7
Palaro	1	1	1	3	3	2	1	2	3	17	6
Patiko	1	2	2	3	3	2	1	2	3	19	6
Bungatira	1	2	2	3	3	2	1	2	3	19	6
Paicho	1	1	2	3	3	2	2	2	3	19	6
Odek	2	2	1	3	3	2	2	1	3	19	6
Lakwana	2	2	1	3	3	2	1	1	2	17	6
Bobi	2	2	1	3	3	2	1	2	2	18	6
Unyama	1	1	1	3	3	2	1	2	1	15	5
Ongako	2	1	1	2	3	2	1	1	2	15	5
Koro	2	1	1	3	3	2	1	1	2	16	5
Lalogi	1	1	1	3	3	2	1	1	3	16	5
Laroo	1	1	1	3	2	0	1	2	0	11	4
Bar-Dege Div	1	1	1	3	2	0	1	1	0	10	3
Layibi Div	1	1	1	3	2	0	1	1	0	10	3
Pece Div	1	1	1	3	2	0	1	1	0	10	3
TOTAL	21	22	20	47	44	24	18	25	30	251	
Key: 3 = High, 2 = Medium, 1 = Low, 0 = Not reported											

Risk Vulnerability

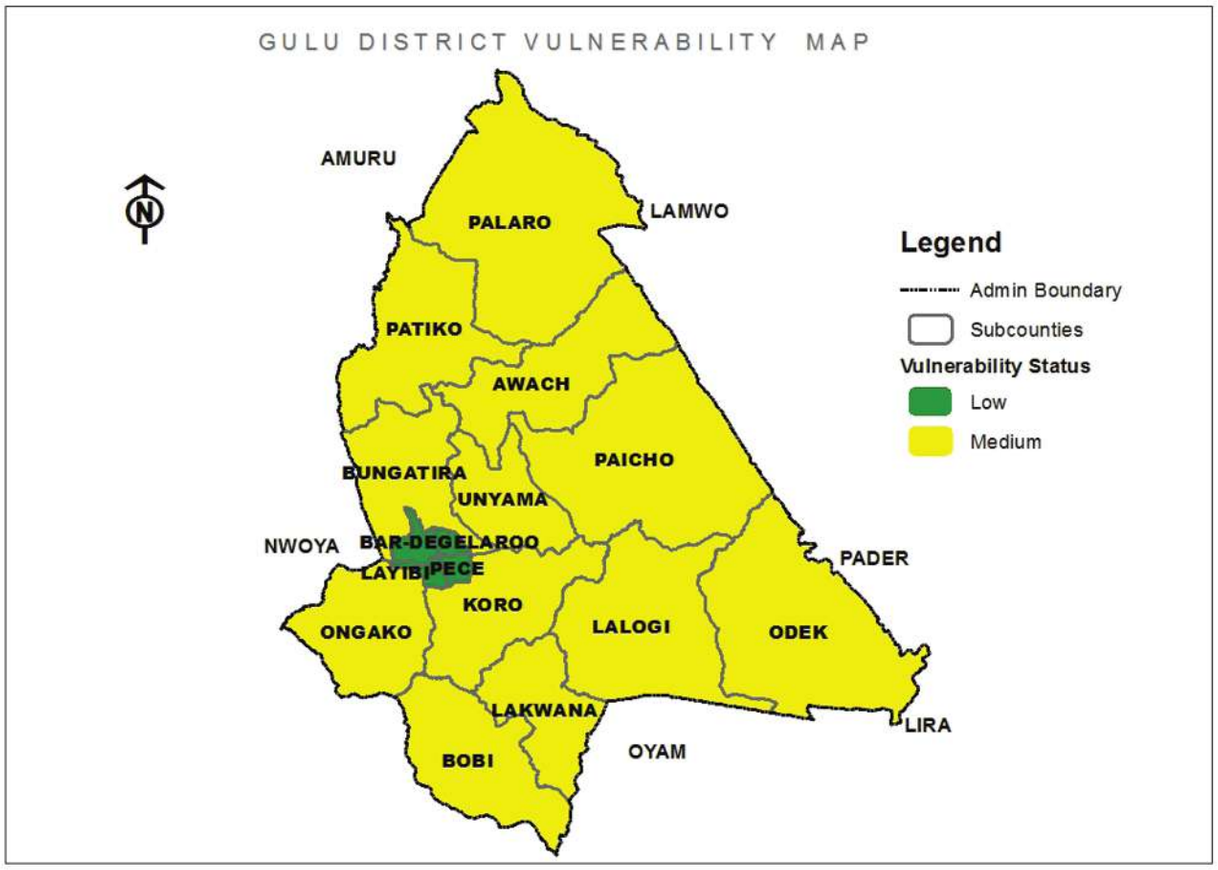

Figure 11 Vulnerability map

Source: Field Data Collected by OPM (Sep. 2014)

The vulnerability map in Figure 11 shows the areas of low, medium and high vulnerability according to the risk and vulnerability table (Table 9) 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.

Gulu District is exposed to 9 hazards namely environmental degradation, Internal conflicts/ land conflicts, bush fires, floods, prolonged dry spell, crop pests and diseases, heavy storms, animal vectors and diseases and human epidemics arranged in their order of risk from highest to lowest with total risks of 47, 44, 30, 25, 24, 22, 21, 20 and 18 respectively. These are due to lack of access to health facilities, lack of capacity to control pests and diseases, charcoal burning and cultivation in wetlands, internal conflicts due to competition for resources, land ownership, Alcoholism and lack of awareness regarding human rights. People have also often burnt bushes in search of cultivation land, pastures for the animals, hunting and sometimes accidentally. The invasive weeds were introduced with the food ratio distributed during the IDP camps and are mostly concentrated around those camps.

Their rate of spreading is very high due to lack of capacity to contain and their mode of dispersion i.e. run off and wind.

Though the District has a high vulnerability, it does not have any Sub-county marked red on the map. As shown by both the table and map, most of the Sub-counties reported medium (yellow) vulnerability with cumulative vulnerability values ranging from 16 to 20 and weighted vulnerability values between 5 and 7. Awach Sub-county has the highest vulnerability in the District with a weighted vulnerability value of 7 (yellow). Bar-Dege, Layibi and Pece divisions were the least vulnerable Sub-counties in the District with weighted vulnerability values of 4, 3 and 3 respectively.

The most affected categories include the women and the children since it's the women who are mostly engaged in Agriculture which is affected by crop pest, environmental degradation, bush fire and invasive weeds. They are also affected by internal conflicts which is characterized by depriving them of farm land and the proceeds.

Conclusions

This multi hazard, risk and vulnerability profile for Gulu 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 Gulu 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 Gulu District is vulnerable to nine hazards, in order of decreasing risk: environmental degradation, Internal conflicts/land conflicts, bush fires, floods, prolonged dry spell, crop pests and diseases, heavy storms, animal vectors and diseases and human epidemics

Even though the District has no Sub-county in the “red” category, Awach is the most vulnerable Sub-county in Gulu District with a weighted vulnerability value of 7 (yellow). Most of the Sub-counties displayed medium vulnerability to the resident hazards with weighted vulnerabilities between 5 and 7. Bar-Dege, Layibi and Pece divisions were the least vulnerable Sub-counties in the District with weighted vulnerability values of 4, 3 and 3 respectively. These Sub-counties though less vulnerable, should also 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.

Timely early warning systems and other DRR interventions would be able to enhance the resilience of the people of Gulu 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.

ANNEXES

Table 10: Annex showing historical background to the land conflicts in Gulu District

SN	AFFECTED AREAS	BACKGROUND OF CONFLICTS
1	Paicho and Odek at Odokolwange.	This is a conflict over forest resources along Odokolwange stream. The community of Omel in Paicho claim that the river is in Paicho and those in Layoko in Odek claim that the stream is in Binya parish Odek Sub-county. It resulted in to community fight between the youth of the two communities.In Odek sub county Aromo wang lobo village has conflict between Parabul Clan and the Langi-Tensions regarding border disputes between the Langi and Acholi. This conflict emanated from a Langi Mukoo (Brother in law) who multiplied and threatened others who originally inhibited the area. Matter in Lira Court.
2	Lalogi Vs Lukwoo clan (alias Lalogi Sub-county vs Paicho Sub-county)	Land boundary and clan differences. Consequences being that members of Lalogi Planted seeds in a garden while they were growing another member of Paicho went and maliciously sowed other seeds in the same garden causing inter clan wrangles
3	Awach Sub-county and Paicho Sub-county Gulu District	Matter relates to boundary dispute since 2009.This matter relates to members of the Pageya Clan who are the majority population in Paicho Sub-county unfortunately many have also entered into Awach land since the return as such a dispute has ensued as People of Awach area of the opinion that All Pageya descendants should stay in Awach Sub-county
4	All the Sub-counties surrounding Gulu Municipality and Gulu Municipality.	All the Sub-counties surrounding Gulu Municipality do not agree with their boundaries and Gulu Municipality. In 1997 the Boundaries of Gulu Municipal was expanded without proper consultation with the Sub-counties. This until now leaves some community in an administrative dilemma.
5	Palaro and Patiko.	There is a bitter land dispute between the Palaro clan and Patiko clan over which Sub-county to belong on Ayugi river.

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

With support from:

United Nations Development Programme

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