THE REPUBLIC OF UGANDA

Lamwo District

Hazard, Risk and Vulnerability Profile

2016

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Acknowledgement

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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 Lamwo District Hazard, Risk and Vulnerability Profile integrates scientific information provided by GOU agencies and hazard and vulnerability knowledge provided by communities on the district base map to contribute to a Ugandan 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.

Lamwo District is located in the extreme Northern part of Uganda 03.3148^{o} N, 32.4800^{o} E (longitude 32.800^{o}, latitude 3.5300^{o}). It is bordered by the Republic of South Sudan in the North, Kitgum District in the East and South East, Gulu District in the South West, Amuru in the West, and Pader District in the South. The district headquarter is 472 Kilometres from Kampala via Gulu, Lamwo District has tropical type of climate characterised by dry and rainy seasons. The district receives average annual rainfall of 1300mm. Rain starts in late March or early April and ends in November. Rainfall is bimodal with peaks in April and August. It is dry-hot and windy from December to mid March. The average monthly maximum temperature is 27^{0} c and average monthly minimum temperature is 17^{0} c and has an estimated projected population of about 164,600 people.

The profile identifies 11 hazards: environmental degradation, internal conflict/land conflict, invasive weed species, floods, animal vectors and diseases, crop pests and diseases, wild bush fires, prolonged dry spell, human epidemics, vermin and problem animals and severe storms

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.

Lamwo District has medium to high risk vulnerability to disaster accumulating risks from several hazards. The Eastern sub-counties of Paloga, Agoro, Madi Opei, Palabek Gem and Palabek Ogili were the most vulnerable in Lamwo District with cumulative vulnerability values of 27, 24, 24, and 23 respectively and weighted vulnerability values of 9, 8, 8, 8 and 8 respectively which lies in the top (red) category of the vulnerability scale. The rest of the

sub-counties displayed medium (yellow) vulnerability with weighted vulnerabilities between 5 and 7. Though still very vulnerable, Lamwo T/C displayed the least vulnerability in the district with a weighted vulnerability of 6.

Though less vulnerable, it 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 Lamwo 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, naganan, and bird flu. Crop disease epidemics include coffee wilt, banana bacterial wilt, cassava mosaic and cassava brown streak disease.

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

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

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

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

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

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

Mines and unexploded ordinance. Mines are devices designed to explode with fatal effect when disturbed. Unexploded ordinance are unspent bullets, grenades, rockets, etc., which are discarded or stored.

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

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

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

INTRODUCTION

The Lamwo 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 Lamwo 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 Lamwo 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 (Lamwo District) from 26th and 27th September 2014. The team had One Disaster Preparedness Officer, One GIS Expert. They worked in the district for 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 and 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 analyzed 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

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.

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 the capture of key local issues related to hazard occurrence and trends. The meeting gave an opportunity to the team and stakeholders to identify other key resource persons and support staff for consultation in the local communities.

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 ground truthing: 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 “hotspots”, 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 analyzed the collected data. The mapping team added thematic layers and hazard incident points (hotspots) 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 disseminate them and promote awareness of their usefulness to local partners.

Overview of the District

Location

Lamwo District is located in the extreme Northern part of Uganda $03^0\,31^0\,48^0$N, $32^0\,48^0\,00^0$E (longitude 32.800, latitude 3.5300). It is bordered by the Republic of South Sudan in the North, Kitgum District in the East and South East, Gulu District in the south west, Amuru in the west, and Pader District in the South. The district headquarters is 472 Kilometres from Kampala via Gulu.

Brief district history

Lamwo District was curved out of kitgum district in the year 2009 by an act of parliament of Uganda and operationalised in January 2010. And later its District headquarters was temporally located at Padibe Town Council and in the year 2012 reallocated in Lamwo Town Council, Ogwec parish, Ongalo village currently with permanent office infrastructure.

Administrative centre

Lamwo district has one county (Lamwo) with nine Sub-counties, Two Town Council (Lamwo TC & Padibe Town council), and Two town boards Palabek Kal and Madi Opei). There are 52 Parishes and 327 villages.

Table 2: Administrative Units

County	Sub County	No. of Parishes	No. Of villages
LAMWO	Lamwo Town Council	7	21
	Padibe Town Council	5	28
	Lokung	6	45
	Palabek kal	4	31
	Palabek Gem	5	28
	Ogili	4	24
	Padibe West	4	48
	Padibe East	4	43
	Paloga	3	27
	Madi Opei	4	26
	Agoro	6	46
	Total	52	367

Vision of the District

A sustainable developed, prosperous and peaceful district

Mission of the District

To effectively and equitably deliver coordinated quality services to the community of Lamwo focusing on the national priority areas

Goal of the District

To promote coordinated development for poverty reduction

The strategic objectives

(1) To enhance stainable production and productivity

(2) To provide quality education and sports

(3) To provide quality health care services

(4) To generate and mobilize sufficient revenue in the district

(5) To increase and improve infrastructure in the district

(6) To sustainably utilize natural resources

(7) To promote good governance, transparency and accountability

(8) To provide and promote social protection, justice and welfare to the community

(9) To provide and improve safe water and sanitation coverage to the community

LAND AREA

Lamwo district has a total land area of 5,486 Sq Km 90 percent of the District is arable 10 percent of land area is covered by Inselburgs and small rivers.

RELIEF

Lamwo District is generally flat; it lies at an average altitude of 1,100 metres above sea level but is generally higher in the North where there are series of mountain ranges (Agoro Aguu) and slopes gently to the west and south west

VEGETATION

The vegetation in Lamwo is mainly of woody Savannah characterized by woody cover and grass layer. The dominant grasses are Hypanthernia, Penicum, brachania and Seteria. Acacia cambrelium constitutes the dominant tree. The District is drier in the northeast and covers parts of the following sub counties Madi Opei , Paloga and Agoro.

SOIL

The soil type in Lamwo Vary with locality but is general well-drained sandy, Clay, Loam and sand clay in some places the following soil exists: *Foresails:* These are strongly weathered and generally with low fertility. It covers much of the district *Gleysols:* These are poorly drained soils, liable to water logging. They are found along Pager River

CLIMATE

Lamwo District has tropical type of climate characterized by dry and rainy seasons. The district receives average annual rainfall of 1300mm. Rain starts in late March or early April and ends in November. Rainfall is bimodal with peaks in April and August. It is dry-hot and windy from December to mid March. The average monthly maximum temperature is 27^0 c and average monthly minimum temperature is 17^0 c.

MINERAL RESOURCES

The effect of tectonic movement has led to emergence of Tors and inselburgs especially along the extreme North Eastern sides of the district.

Geological survey was carried out in the district and some minerals were found to exist. Cement deposit were found in Lalak hill in the border of Lokung and Padibe Sub Counties.

DEMOGRAPHIC CHARACTERISTICS (POPULATION)

Based on the 2002 population and housing census, Lamwo has a population of 115,344 people. Of these 57,977 are male and 57,367are female. The projected population in 2011 is 164,600.

The population of the District is young, with age group 0-14 constituting about 48%. This puts a great pressure on the working population. The inter censual growth rate is 4.1% which is exceptionally very high and if not checked the population will double in a decade.

The sex ratio stands at 97 indicating imbalance in the sex structure, this in future will cause problems like high birth rates, population momentum as a result of high replacement rate. There could also be social problems like domestic violence and negative factors of polygamy.

Table 3: Population of Lamwo as of 2011 population and Housing census

Sub-County	2002 population				2011 projection		
	No of H/H	Male	Female	Total	Male	Female	Total
Agoro	3565	8427	8116	16543	12,200	11,400	23,600
Lokung	5250	10240	9798	20038	14,900	13,700	28,600
Madi-Opei	2726	5351	4947	10298	7,800	6,900	14,700
Palabek Ogili	1885	4165	4386	8551	6,000	6,200	12,200
Padibe East	2556	6097	6570	12667	8,800	9,200	18,000
Padibe West	2377	5584	6285	11869	8,100	8,800	16,900
Palabek Gem	3028	6633	6006	12639	9,600	8,400	18,000
Palabek Kal	2659	6550	6236	12786	9,500	8,800	18,300
Paloga	1619	4930	5024	9954	7,200	7,100	14,300
Grand total	**25369**	**57977**	**57368**	**115341**	**84,100**	**80500**	**164,600**

Source: UBOS. *The population of Lamwo TC is included under Lokung and Padibe Town Council under Padibe East and Padibe West

Relevant cultural and ethnic issues

There is one major tribe in the district. Acholi being the majority however we have the Madi in the subounty of Palabek Ogili in paracelle parish

Due to various economic activities we have other tribes who come from other parts of the country namely: Bagisu, Baganda, Banyakole, Iteso, Baruli among other tribes

Environmental issues

In Lamwo district, environmental degradation is shown through environmental challenges namely; Soil degradation, Deforestation, Pollution of water in the rural growth centres, wetland degradation, which limits the ability of the people to meet their needs.

Economic activities

Like many districts in Uganda, the major economic activities of Lamwo district is subsistence small scale agriculture which includes crop production, animal husbandry and produce buying. Scanty fishing is also carried out. The people grow a variety of food and cash crops. Over 90% of the farmers are engaged in crop production as their major activity and a small percentage in livestock keeping and fishing

Farming is carried out using family labor for domestic consumption and part of the produce is sold to meet basic domestic requirements. Domestic animals are also reared and this include cattle, goats, pigs, sheep and chicken, small scale petty trade take place in the small trading centers. There are also ample undeveloped tourist attractions at Lotuturu hills, the source of Aringa river and Agoro mountain ranges.

Transport infrastructures

The only transport available in the district is by roads. The district has a total of 593 Kms of roads classified as ,283 Kms of trunk roads under the control of Uganda National Road Authority, 155 Kms is rural feeder roads under Lamwo district and, 153 Kms is community access roads which is maintained by the community under the supervision of sub counties administration. Almost all the roads are in bad situation that need rehabilitation

Livelihoods

Lamwo district is situated in an Agro –ecological zone very much suited for agricultural development and others.

Table 4: Lamwo District Main Livelihoods, by Sub-County and Town Councils

Agro-ecological	Livelihoods	Sub county
Highland Zone	Agriculture Animal raring Fuel wood Small scale hunting Lumbering Apiary	Agoro, Lokung, Madi Opei, Paloga, Lokung
Gently sloping zone	Agriculture Fuel wood Lumbering Stone quarrying Apiary	Palabek Kal, Palabek Gem, Palabek Ogili, Lokung,Padibe East, Padibe West, Paloga,
Lowland	Agriculture Lumbering Small scale Commercial business- Retail and whole sale shops Small scale fishing Sand mining Apiary Brick making Small scale savings and credit cooperative society (SACCO)	Palabek Kal, Palabek Gem, Palabek Ogili, Lokung,Padibe East, Padibe West, Paloga, Lamwo Town Council, Padibe Town Council

Hazards

Table 5: Hazard status and ranking

Hazard	Status	Sub counties	Rank
Floods	Instances of water logging and flash floods reported; destroying crop gardens of millet and simsim, roads, bridges, sanitation facilities collapsing as a result and settlements/home steads displaced. In all the sub-counties	Agoro, Lokung, Madi Opei, Paloga, Palabek Kal, Palabek Ogili, Palabek Gem, Padibe East , West Lamwo TC and Padibe TC	**5**
Prolonged Dry Spell	Widely reported especially from December –April and June - July affecting majority of the crops resulting into severe food insecurity	In The Entire District (Agoro, Lokung, MadiOpei, Paloga, Palabek Kal,Palabek Ogili, Palabek Gem,Padibe East, Padibe West Lamwo and Padibe TC But Most Affected Ones Include; Paloga, Madi Opei, Padibe East	**8**
Vermin's and wild animals	Instances of elephants, hippos, leopards, baboons, velvet monkeys, hyenas invading animal farms and gardens, i.e in Cubu; Anaka 3 bulls were eaten	All subcounties; Agoro, Lokung, Palabek Ogili, Palabek Kal, Palabek Gem, Paloga, Madi Opei, Padibe West, Padibe East Lamwo and Padibe TC	**10**
Crop pests and diseases	Instances of Cassava Mosaic, Banana Bacteria Wilt, Maize Lynthonicrosis, Maize Streak,cassava brown streak, beatles ,stem burg, affids, ground nut rosset, bean anthragonosus, streakvirus, citrus canker reported	All Subcounties; Agoro, Lokung, Madi Opei, Paloga, Palabek Kal, Palabek Ogili, Palabek Gem, Padibe East, West and TC	**7**
Animal pests and diseases	Instances of CBPP, Foot and Mouth Disease, rabbies, tick borne disease, diahorea In cattle Swine fever reported	Agoro, Madi Opei, Paloga, Palabek Kal,Palabek Ogili, Palabek Gem, Padibe East ,West And TC	**4**
Environmental degradation	Instances of massive tree cutting, murram, sand and stone extraction reported, Padibe Local Forest Reserve and Palabek Kal Local Forest Resrve	Agoro, Lokung, MadiOpei, Paloga, Palabek Kal, Palabek Ogili, Palabek Gem, Padibe East , Padibe West ,Lamwo TC and Padibe TC	**1**
Internal conflict/ Land Conflicts	Instances of conflict over land, resource use and clan or tribal issues reported Padibe Girls comprehensive school, Padibe Boys , Padibe SS, Padibe West HCIII	Agoro, Lokung, MadiOpei, Paloga, Palabek Kal, Palabek Ogili, Palabek Gem, Padibe East, West and TC	**2**

Hazard	Status	Sub counties	Rank
Invasive weed species	Instances of congress weed and striger weedswidely spread in the entire district but mostly in Agoro, Paloga,AndMadiOpei	Agoro, Lokung, MadiOpei, Paloga, Palabek Kal, Palabek Ogili, Palabek Gem,Padibe East , Padibe West, Lamwo and PAdibe TC	**3**
Severe storms/ Lightning	Instances of strong winds, lightning and hailstorms reported affecting roofs of schools, health centers, houses and crops, Lagwel P/S, Kal Primary school, padibe Boys primary school	Palabek Kal, Palabek Ogili, Palabek Gem,Padibe Tc, Padibe East And Padibe West	**11**
Wild bush fires	Instances reported seasonally/ annually and its wide spread in the entire district	Agoro, Lokung, MadiOpei, Paloga, Palabek Kal, Palabek Ogili, Palabek Gem, Padibe East ,Padibe West and Lamwo TC and Padibe TC	**6**
Human epidemics	Cases of Nodding Disease Syndrome, Hepatist B, Rabbies, YellowFever, Epilisy reported Severe in Palabek Gem	Palabek Kal, Palabek Ogili, Palabek Gem,Padibe Tc, Padibe East and West, Lokung, Agoro,Madi Opei	**9**

Table 5 displays the status and summarizes the nature of hazards in the district and provides the locations of instances. It also ranks the hazards according to their magnitude.

Table 6 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 6: Hazard risk assessment

Sub county	Hazards										
	Floods	Prolonged Dry Spell	Vermin and problem animals	Crop pests and diseases	Animal pests and diseases	Environmental degradation	Internal conflict/Land conflict	Invasive weed species	Severe storms	Wild bush fires	Human epidemics
Agoro	M	M	L	M	H	H	H	H	M	M	L
Lokung	H	L	L	M	M	M	H	M	M	M	L
Lamwo TC	L	L	L	M	M	M	M	M	L	M	L
Madi Opei	M	H	L	M	H	H	H	H	L	M	L
Paloga	H	H	M	M	H	H	H	H	L	M	M
Palabek Kal	H	M	M	M	M	M	M	M	L	M	M
Palabek Ogili	H	M	M	M	M	H	M	M	L	M	M
Palabek Gem	M	M	M	M	M	H	H	M	L	M	H
Padibe West	M	M	M	M	M	H	M	M	M	M	L
Padibe East	M	M	L	M	M	H	H	M	L	M	M
Padibe TC	M	L	L	M	M	H	M	H	L	M	L
Key: H = High, M = Medium, L = Low, N = Not reported											

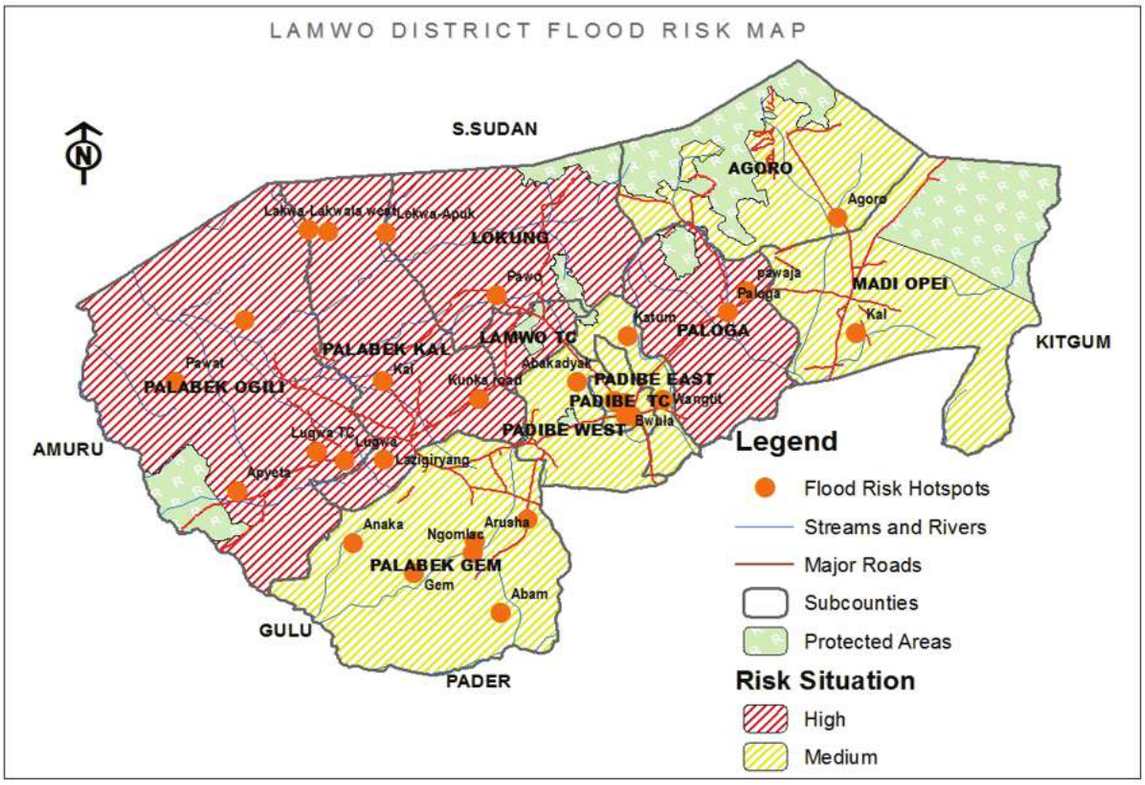
Hazard Risk Assessment

Table 7 expresses the communities' assessment of severity and likelihood of risk in their respective sub-counties. Each of the columns in table 7 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

Floods

Figure 1: Flood Risk Map



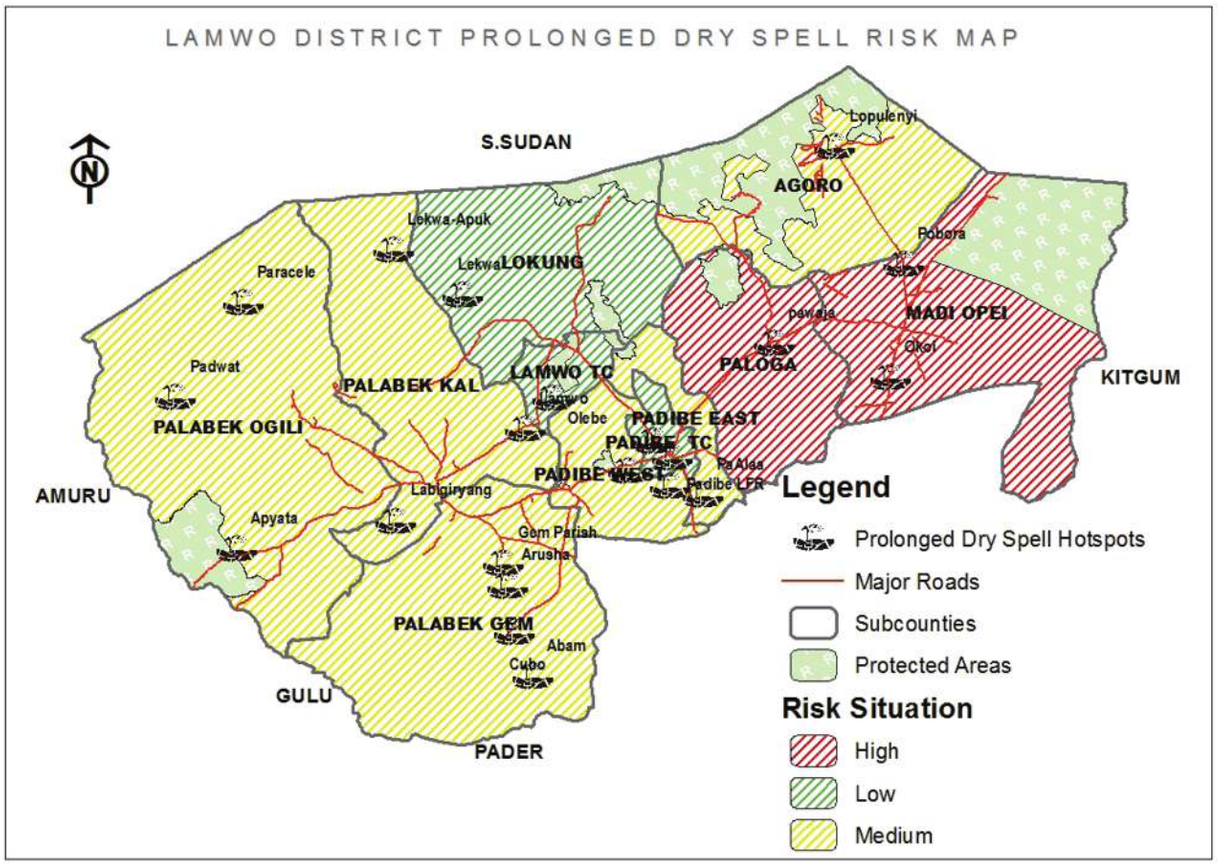
Source: Field Data Collected by OPM (September, 2014)

Water logging and flash floods are a common occurrence in Lamwo district. Cases of destroyed gardens (mainly millet and simsim), roads, bridges, pit latrines collapsing and displacement of communities were reported and most likely going to happen every year. The risk levels are varied in the district: Palabek Ogili, Palabek Kal, Lokung and Paloga Sub Counties are faced with the highest risk of floods; while Agoro, Madi Opei,Padibe East, Padibe West, Palabek Gem and Lamwo Town Council are facing off with moderate risk of floods.

The epicenters of floods are in the following parishes by sub county: **Lokung** (Pawor Parish- Mudu village, Lacan Odwogo Village, bwot atum village, latida village, potwach village, yoke village and lemur village, Parapono parish- looli village, omwa village, guria west, guria East, Guria central, Guria North villages, Dibolyec Parish- Latikiriyo village, pateke village, ber lobo village, ywaya village, aweno olwi, **Palabek Kal (**Lamwo Parsh- Orom Central, Orom West, Orom East, Ayuu Alali Parish- Liri Central, Kantunguri, Pa woda ating, otong wod pa wor villages, Kal Parish- Pauma North) **Palabek Ogili** (Padwat, Paracelle and Lugwar Parishes), **Madi Opei** (Okol parish, kirombe viiage, lawiye oduny, lucimidic), Paloga, **Agoro** (Rudi Parish and Pobar- all villages affected in the two parishes), **Palabek Gem** (Moroto Parsh- Labwor oyeng village and Arusha village, Gem Parish, Anaka Parish, Patanga Parish, Cubu Parish- Abera village. **Padibe East** (Katum, Wangtit), **Padibe West** (Abakadyak Parish- Lagot Okanga Village), **Lamwo TC** (Ogwec Parish- Ongalo Village), **Padibe TC** (Atwol A and B villages, Kamama Central).

Prolonged Dry Spell

Figure 2: Prolonged Dry Spell Risk Map



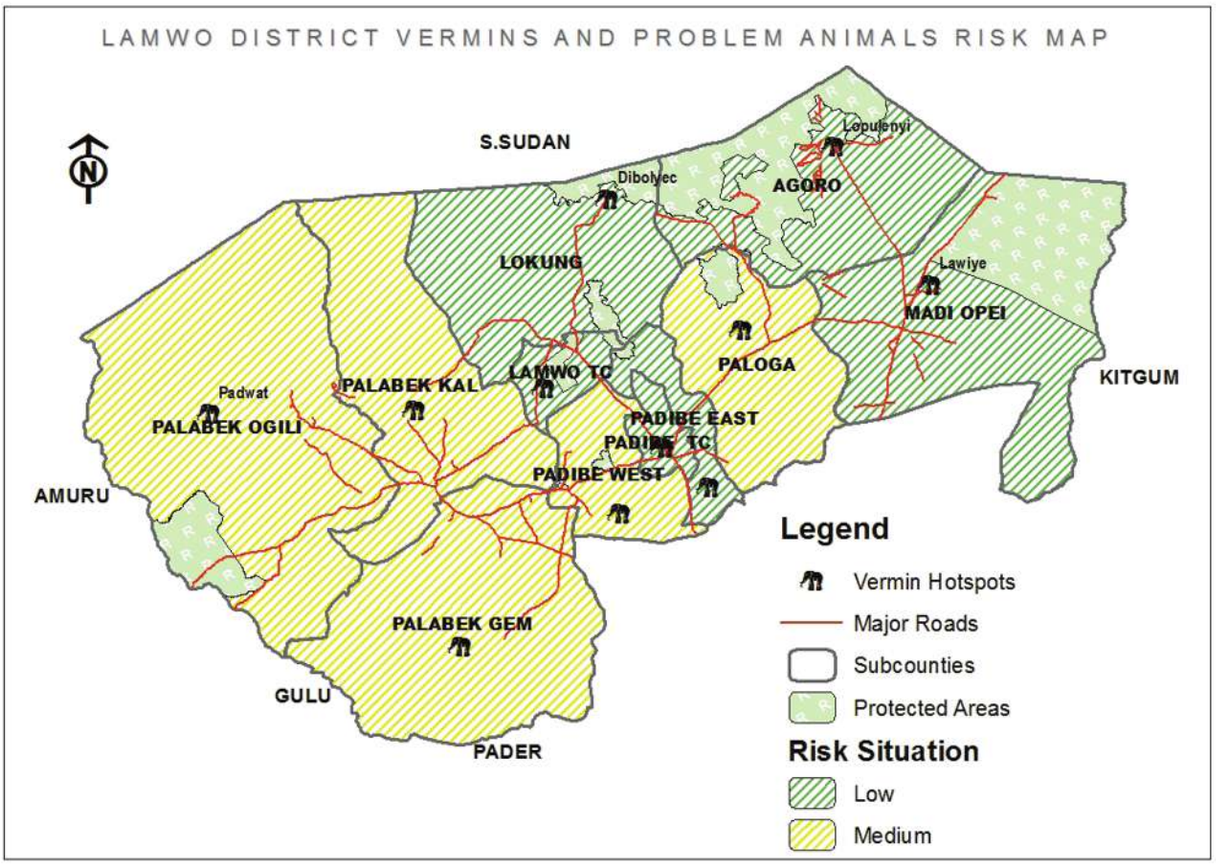
Source: Field Data Collected by OPM (September, 2014)

The known dry season normally begins in the month of December to March so that April and May have rains and June is normally a dry spell and then July to November is the second rainy season. However, these days the first season rains delay till May leading to complete crop failure in the first season. In the same way the second season rains delay up to September.

Much as extended dry spells affect the entire district, Paloga and Madi Opei sub Counties are predisposed to high risk as represented by red colour in the map while Lokung Sub County, Padibe East, Padibe Town Council and Lamwo Town Council are exposed to low risk represented by the colour green. The other sub counties are subjected to moderate risk of prolonged dry spell as depicted on the map by colour yellow. This results into severe food shortage, lack of planting materials, ill health of animals due to lack of pasture and water as well as in household incomes mainly from farming.

Vermin and Problem Animals Risk

Figure 3: Vermin's and Wild Animals Risk

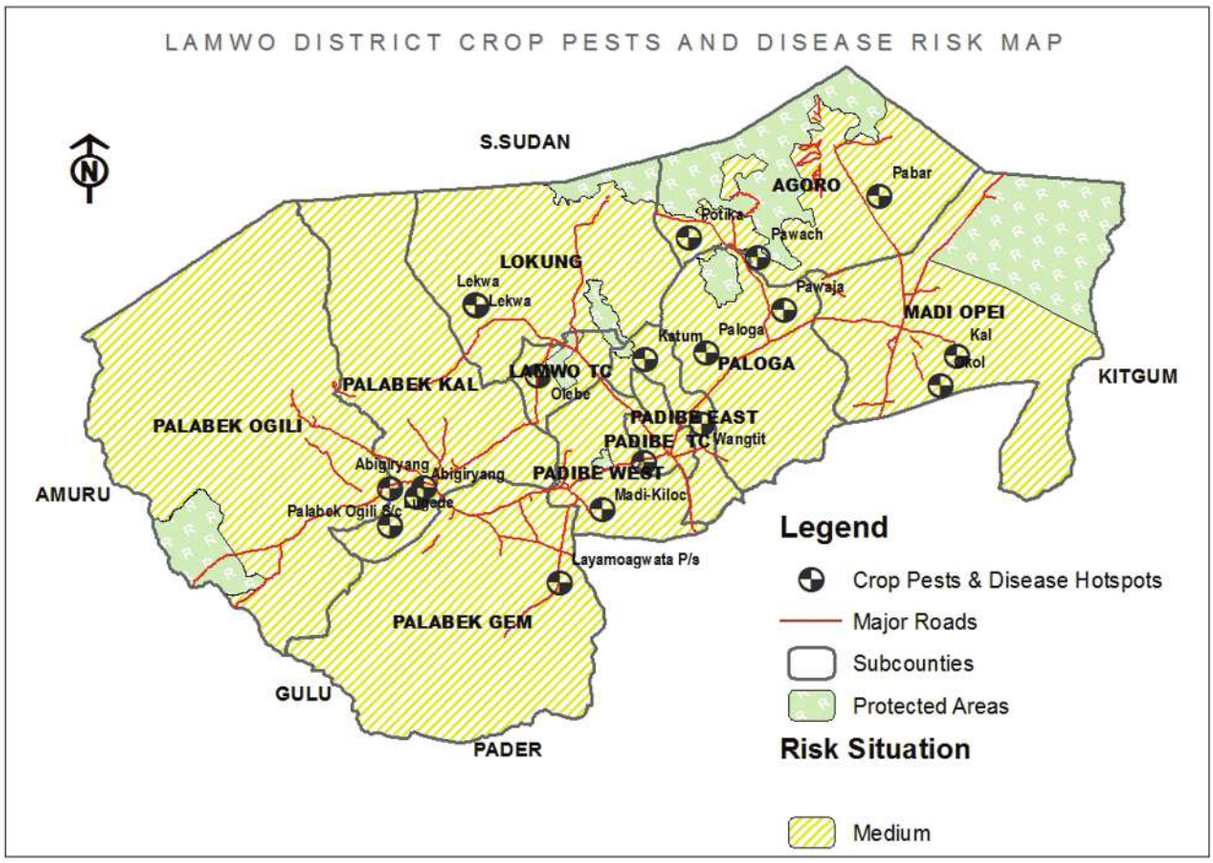


Source: Field Data Collected by OPM (September, 2014)

Instances of elephants, hippos, leopards, baboons, velvet monkeys, hyenas invading animal farms and gardens were reported. Lokung, Agoro, Madi Opei, Padibe East sub counties and Lamwo and Padibe Town Councils are predisposed to low Vermin and other problem animals risk while the rest of the district is moderately at risk. The details of some of the incidences reported are: Palabek Gem Sub county in Cubu Parish; Anaka Paish 3 bulls were eaten. Two Bafallos with a calf destroyed crops in Okol and lawiye oduny, in Lamwo town council baboons and black monkeys destroyed crops in Ocula north and Ateng parishes-Atiba Parish in Lagot Agoro and cases of snake bites were reported. Small animals like squirrels, edible rats destroyed crops near harvesting period in the entire district.

Crop Pests and Diseases

Figure 4: Crop pests and diseases risk map

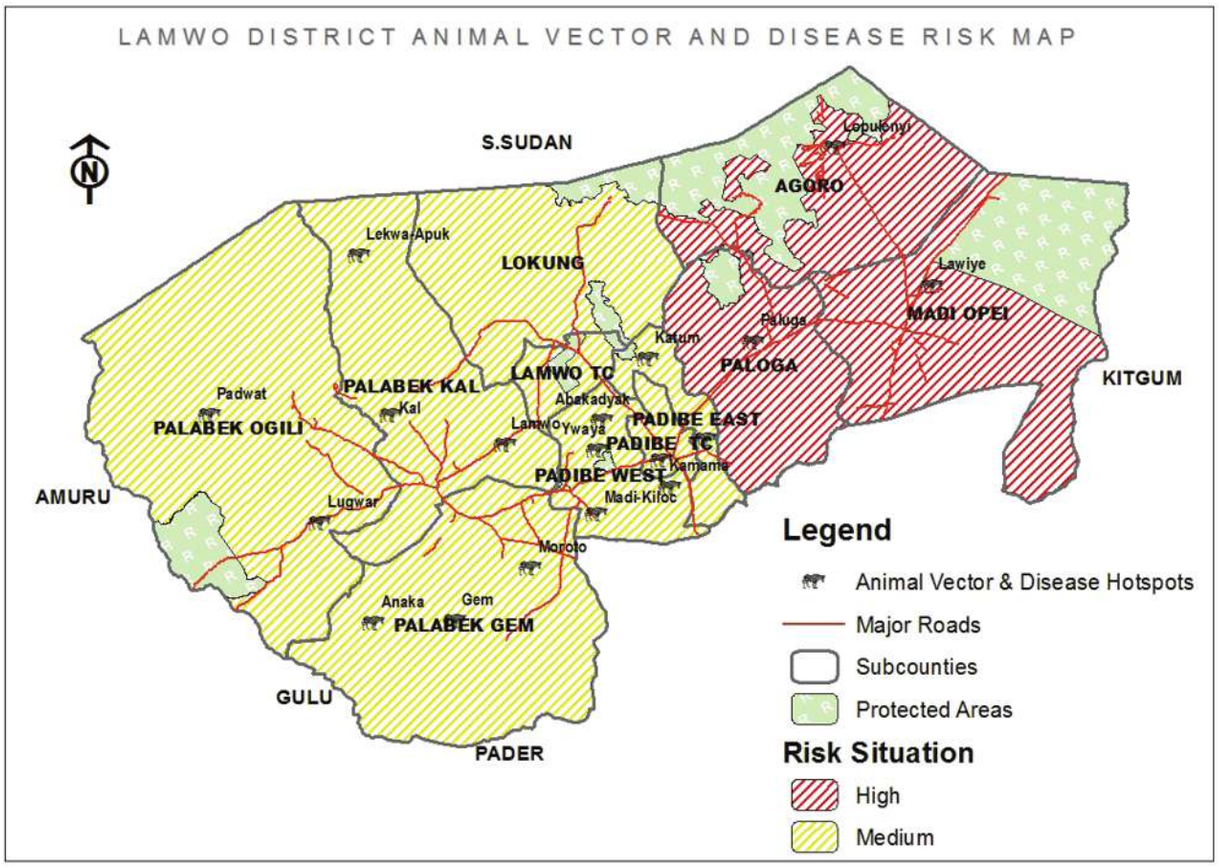


Source: Field Data Collected by OPM (September, 2014)

In Lamwo district, crop pests and diseases are rampant in all sub counties posing a moderate risk to the population as depicted by the yellow color on the map. Instances of cassava mosaic were reported in all parishes of Palabek Ogili Sub County while Cassava Mosaic and Banana Bacteria Wilt were reported in Palabek Gem and Lokung sub counties in Licwa, Lelapwot, Pangira, Pawor parishes. Maize Streak virus, cassava brown streak, beatles, stem burg, aphids, ground nut rosette reported in Rudi and Pobar parishes in Ngacino and Lopulongi Villages respectively, bean anthracnose, streak virus, citrus canker reported in Padibe west Ywaya Parish- Kapwata Village, Madi kiloc parish- Biwang central Village. Striga weed is yet another pest which causes loses in cereals ranging from 65% to 92%.

Animal Vectors and Diseases

Figure 5: Animal vectors and diseases risk map



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

Animal vectors and diseases pause moderate to high risks to the people of Lamwo district. The sub counties of Agoro, Paloga and Madi Opei face high risks as shown by the red color on the map while the rest of the sub counties and town councils face moderate risk as depicted by the yellow color on the map. Cases of CBPP, Foot and Mouth Disease (FMD), rabbies, tick borne disease, diahorea in cattle; Swine fever in pigs were reported in Paloga sub county, pawaja parish, Ongalo village. New castle Disease and Coccidiosis were reported in the above places as well as all the other parishes in the District.

Agoro sub county reported cases of FMD, CBPP, CCPP in all the six parishes but the most affected are Rudi and Lopulongi. Madi Opei reported cases of FMD and NCD in all the Parishes of Pobura, Okol, Lawiye oduny and Kal. Cases of animal diseases such as Foot rot, Nagana and worm infectation are reported in the parishes of Licwa, Lelepwot, Pangira, Parapono, Pawor, Dibolyec.

Foot rot, Nagana, Tick borne diseases and worm infestation reported in all the Wards in the Town Council. Palabek kal reported cases of FMD in the parishes of Kal, Lamwo and Ayuu Alali

Palabek Ogili repoted cases of animal diseases in Lugwar, paracelle and Padwat parishes.

CBPP and FMD reported in the Parish of Moroto and the parish of Gem had 10 cases reported. Also the rest of the parishes had cases of animal diseases.

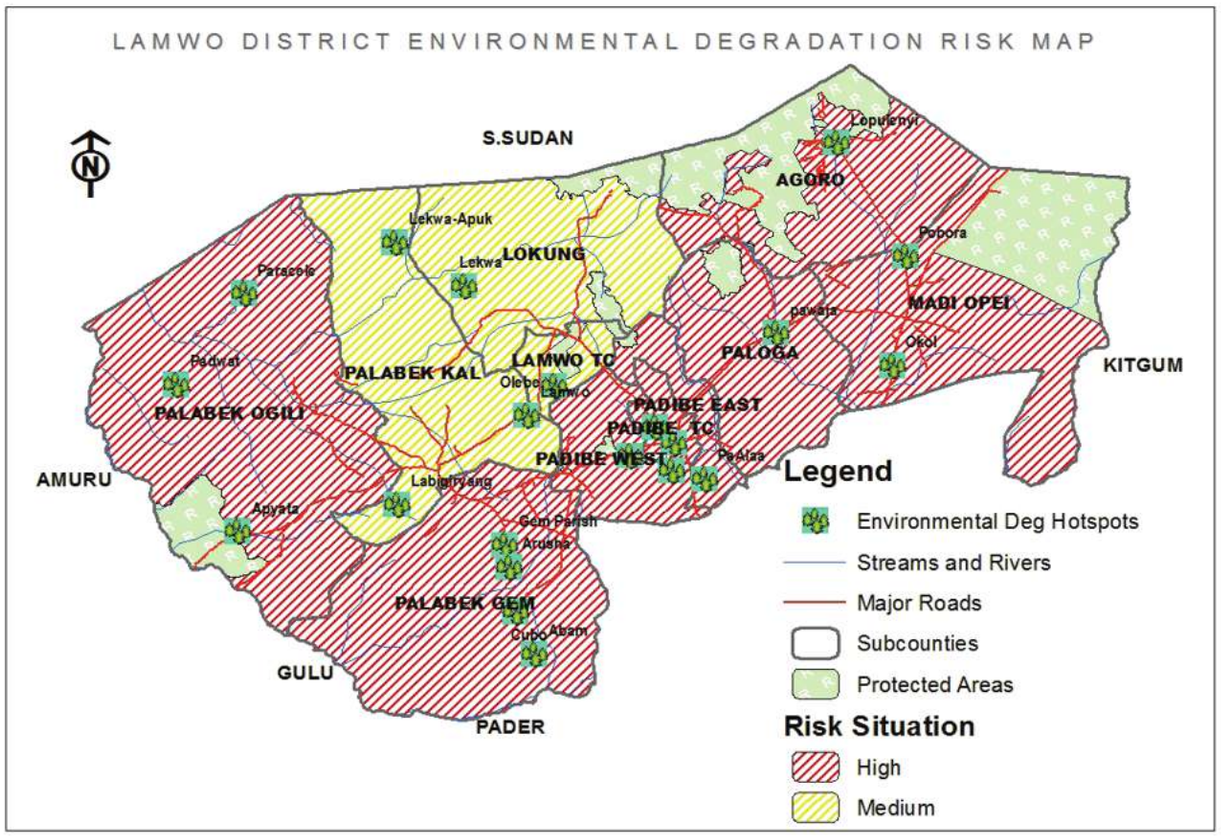
Loi bide cell, Kamama Parish in Padibe Town Council reported high cases of FMD.

Padibe east sub county wantit parish the following villages reported cases of FMD;- Locken East, West and Ogako North and south and in Katum Parish all the Villages were affected.

In Padibe west sub county the parishes of Lagwel, Ywaya, Abakadyak and Madi kiloc reported cases of Tick borne disasease, Diahhorea which affected cattle and Goats.

Environmental Degradation Risk

Figure 6: Environmental degradation risk map



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

Environmental degradation in Lamwo district takes the form of deforestation compounded by population pressure on land. The increase in population translates into opening of more land for agriculture, lumbering for various reasons, harvesting bamboos for house construction among others. Lamwo district is the leading producer of Simsim in the whole country lately such that lands which were put under communal hunting (Aker) have been turned into gardens. Charcoal burning and wood fuel is another factor for the rampant deforestation in the district. This is common in the subcounties of Agoro, Lokung, Palabek Kal, Palabek Gem, Palabek ogili, Padibe West, Paloga and some parts of Padibe East. Padibe Local Forest Reserve and Palabek Kal Local Forest Reserve are typical victims of the vice.

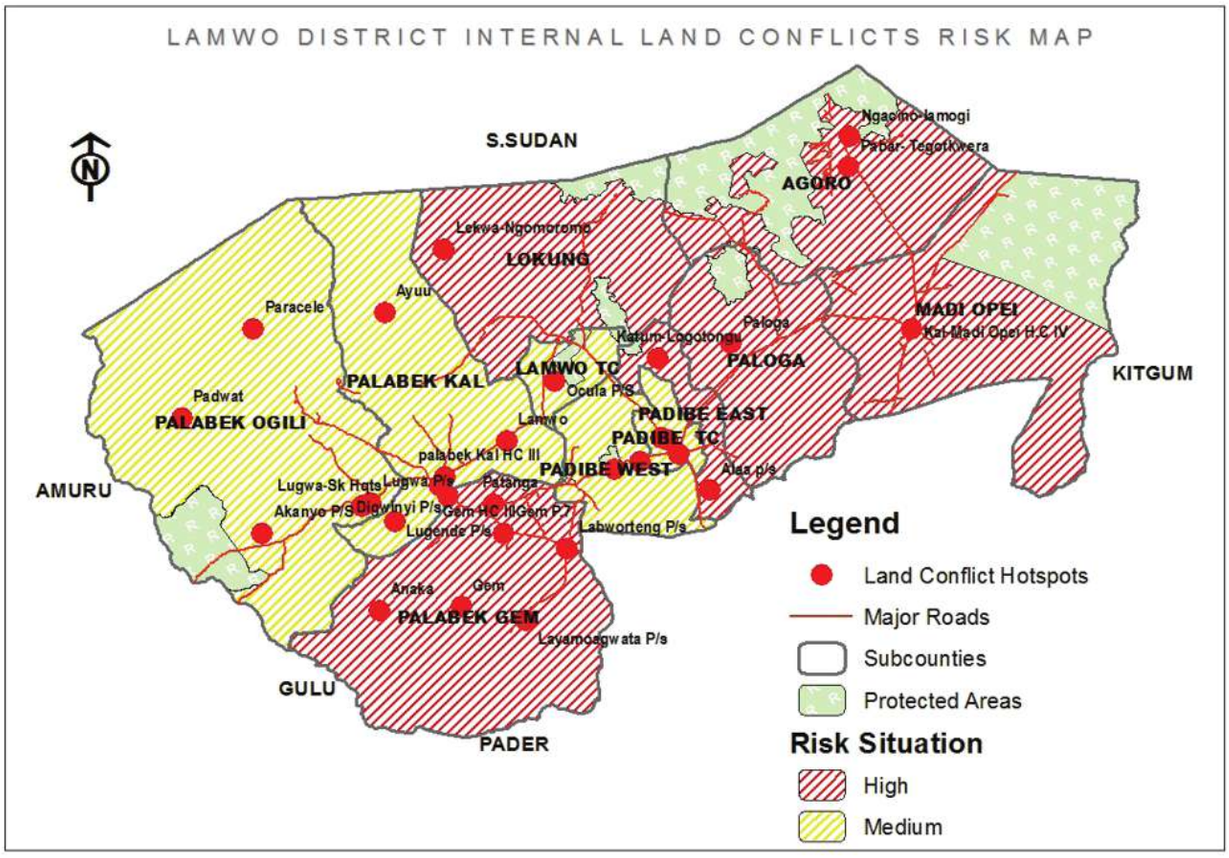
Lamwo Town Council in particular has a Central Forest Reserve which has been depleted by the communities surrounding the CFR.

Murram excavation for road construction by the District, Town Councils and Central government (Uganda National Roads Authority) normally little or nothing is done to restore the borrow pits; sand and stone extraction are equally reported.

Environmental degradation is rampant across the entire district with largely high risks posed in most of the district and only Lokung, Palabek Kal Sub Counties together with Lamwo Town Council facing moderate risks. The high and moderate risks of environmental degradation are depicted by red and yellow colors respectively on the map above.

Internal Conflict/Land Conflicts Risk

Figure 7: Internal conflict/Land Conflicts risk map



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

Internal conflicts in Lamwo district are synonymous with land conflicts. It is wide spread in the district, though the magnitude is varied: Agoro, Lokung, Madi Opei, Paloga, Palabek Gem, and Palabek East sub counties face high risks of internal/Land Conflicts while the rest of the sub counties and town councils are faced with moderate risk. The high and moderate risks are annotated red and yellow on the map. The land conflicts are categorized into institutional land conflicts and inter clan conflicts as below.

Institutional Land conflict in the district is mainly over landownership, land use and resource utilization. Resource use and ownership is contested between institutions mostly schools and health facilities and the host communities' clans. These were reported in Padibe Girls Comprehensive School, Padibe Town Council head quarters, Padibe Boys , Padibe Secondary School, Padibe West HCIII, Dicwiny Primary School, Palabek Kal Primary School, Kapeta HC II, Palabek Kal HC III, Palabek Ogili HCIII, Lugwar Primary School, Akanyo Primary School, Sub county Headquarter, in Palabek Gem;- Gem P/S, Ayuu anaka P/S, Beyo ogoya P/S, Gem mede P/S, Ligiligi P/S, Palabek Kal S.S, Labworoyeng P/S, Layamo Agwata P/S, Palabek Gem HCIII, Padibe East:- Ogako P/S, Alaa P/S, Padibe west:- Padibe West HC III, Padibe west S/C, Paloga sub county:- Agoro sub couty Lomwaka P/S and NFA, HCII

Potika, sub headquarter. Madi Opei HCIV, Madi Opei Primary school and Community, Sub county boundary conflicts between Lokung and the following subcounties viz Agoro, Paloga, Padibe East and Palabek kal. Madi Opei Vs Paloga and Mucwini (Kitgum).

International boundary conflict between Uganda and the Republic of South Sudan were also reported. There are also internal boarder conflicts in Madi Opei, Agoro, Palabek Ogili, Palabek Kal, Lokung sub counties. In 2013, 9 people were arrested over related conflicts.

Inter clan conflicts were reported in Lamwo Town Council where cases report of:- Pajulu Clan Vs Forest Reserve, Ateng Parish Vs Palabek Kal S/c, community of Olebi and Ateng, Pakalabule Vs Parapono, Palwo Vs farmers group called Abongo Lajuk in Lokung sub county.

Agoro there are land wrangles between the communities in Pobar, Ngacino and lopulogi.

There are boarder conflicts between communities in Lamwo, Ayuu and Kal Parish in Palabek Kal, Palabek Ogili communities of Padwat and Paracelle on the areas of Tim Padwat which used to be a hunting ground.

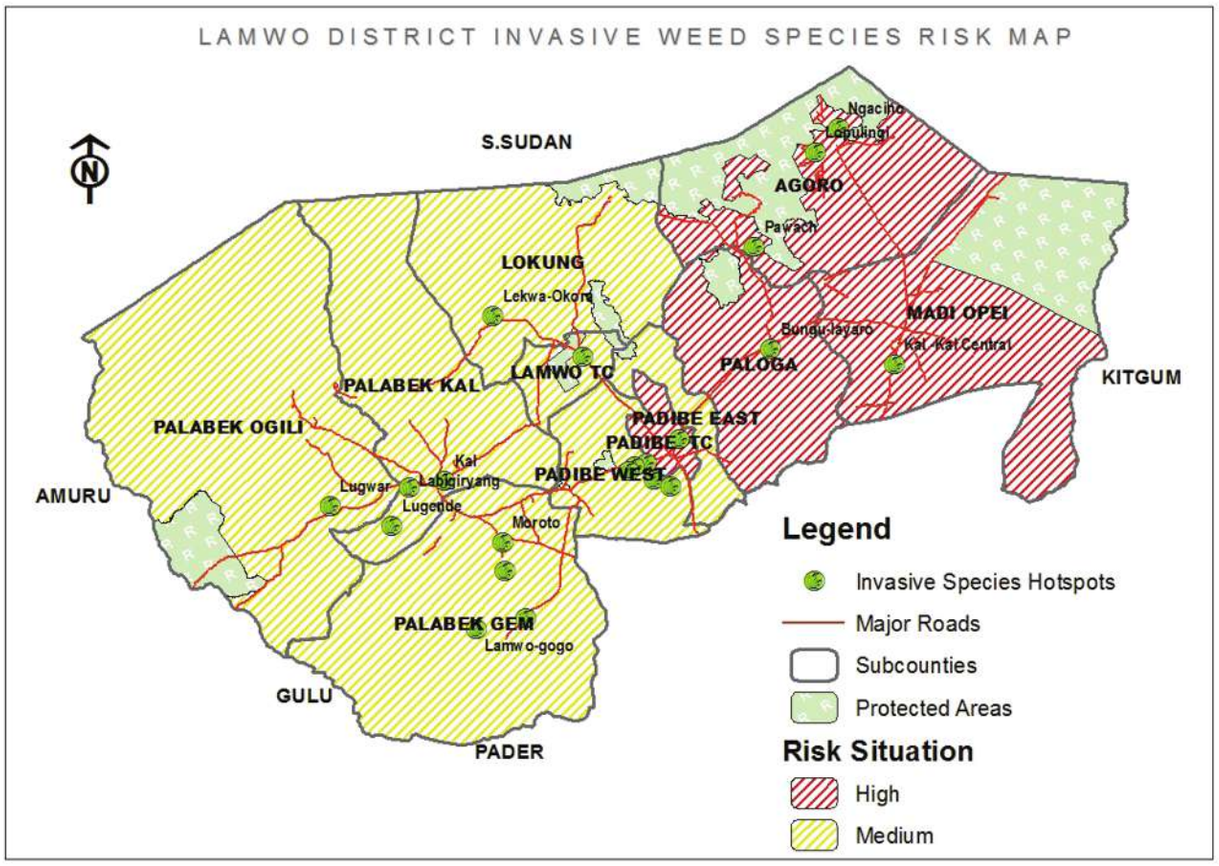
Palabek Gem communities/individuals in and the parishes of Cubu, Gem, Anaka, Moroto and Patanga.

Padibe West:- Ayom Village Clans of Pagwe and Pamot over land.

Cattle theft is mainly in the sub counties of Madi Opei and Agoro and the Sudanese.

Invasive Weed Species

Figure 8: Invasive weed species risk map



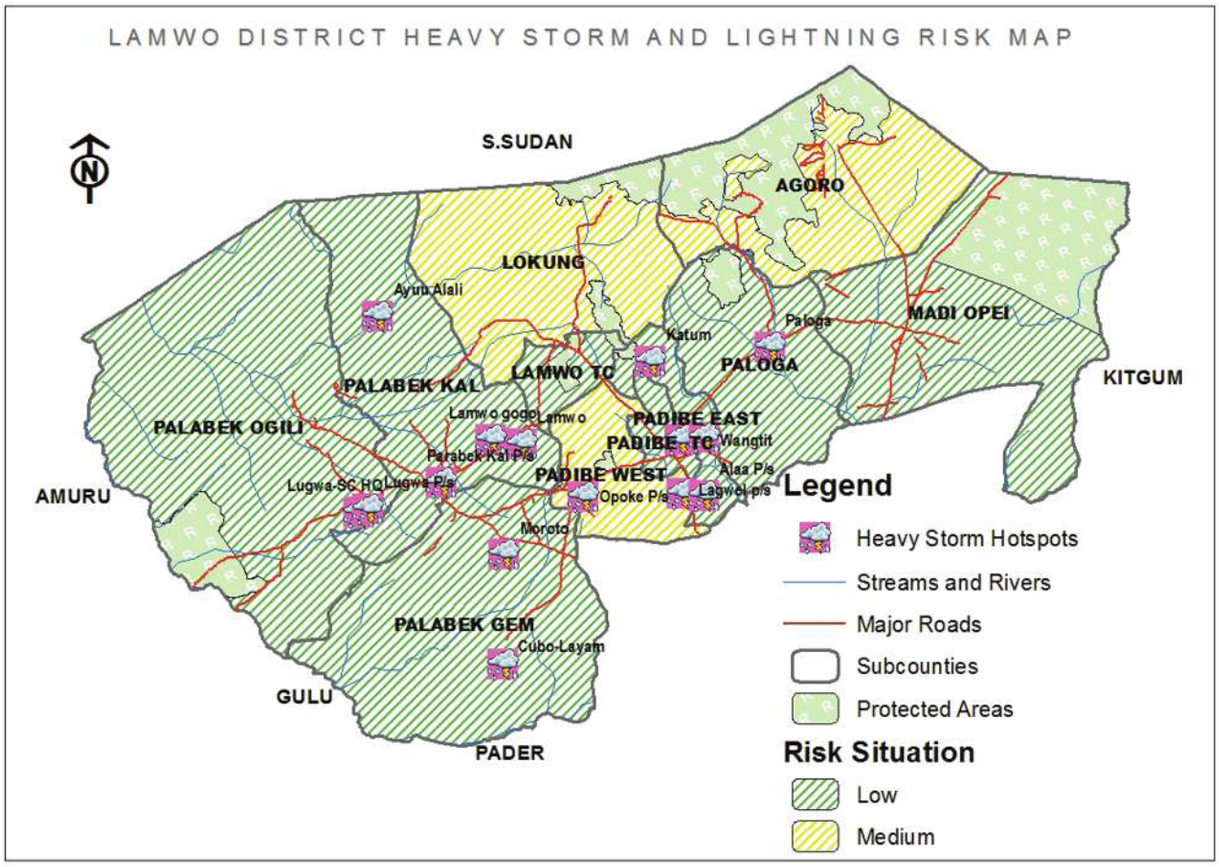
Source: Field Data Collected by OPM (September, 2014)

Weeds are affecting progress in agricultural communities of Lamwo district. Cases of congress weed and striger weeds are widely spread in the entire district but mostly in Agoro, Paloga, and Madi Opei.

The weeds normally affect fields of cereals like sorghum, maize and other crops. The weeds are common in the former IDP camps and gardens which have been over cultivated and hence its effect leads to low yield or no yield at all.

Heavy Storms

Figure 9: Heavy storms risk map



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

Strong winds, lightning and hailstorms are associated with heavy rains. Most building do not have facilities which can contain the effects. It is reported to have affected of schools, health centers, settlements and crops e.g in Lagwel P/S, Kal Primary school, padibe Boys primary school, In lagwel primary school in the year 2007 lightning struck and Killed four (4) soldiers and in 2012 it killed two (2) pupils , 2014 a boy was also killed and also the roof of the school was blown off and also Opoki primary school one of the blocks the roof was blown away, In Madi Opei subcounty a woman was killed by lightning in Okol parish, In Palabek Kal wind blow off the roof of classrooms in Lugede P/s and Palabek P/S.

Heavy storm has also been occurring in the entire district but the worst affected agricultural fields are in lokung, Padibe East, Lamwo Town Council, Palabek Ogili in all the parishes, Palabek gem mainly in Cubu and Moroto parish.

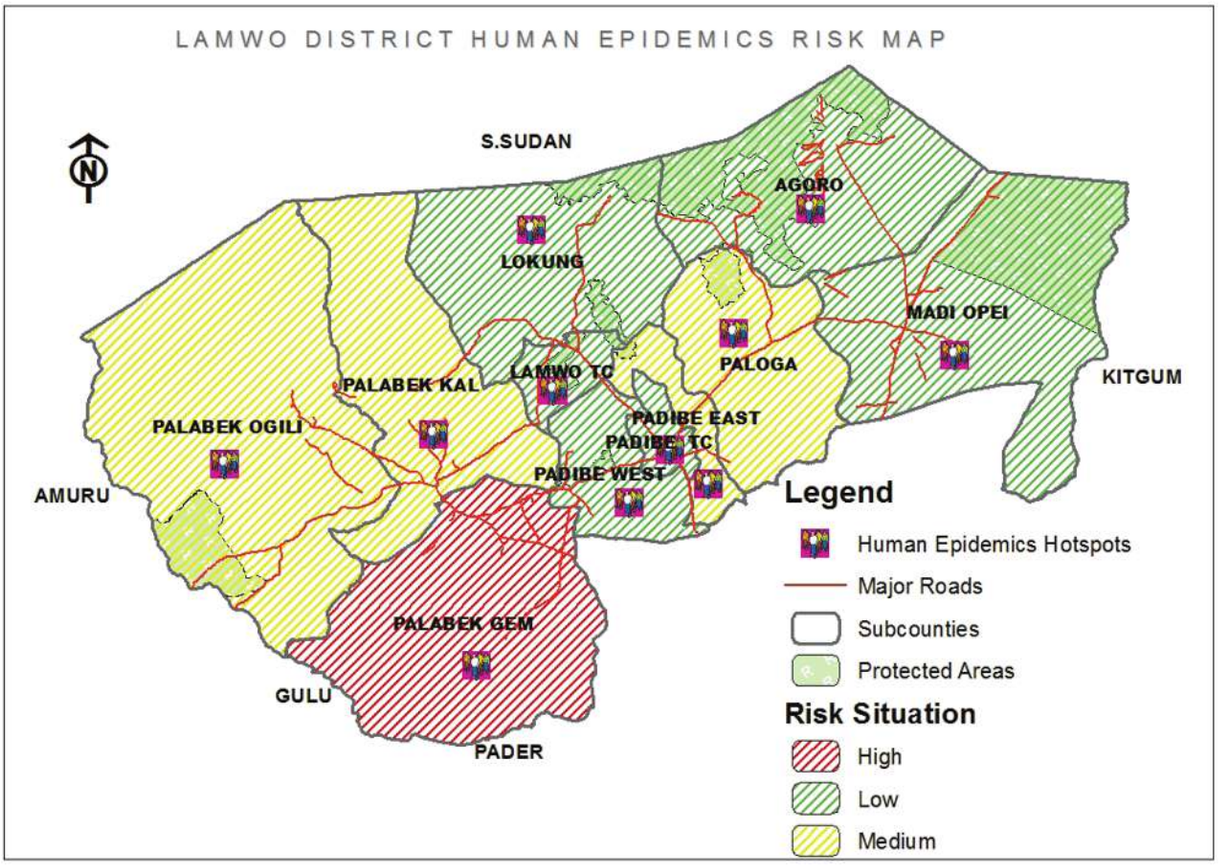
Wild Bush Fires Risk

Figure 10: Wild bush fires risk map

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

Bush fires are common during dry season while hunting for animals, creating buffer zones for agricultural field and generating pasture land for agriculture and also accidental bush fires, seasonally its wide spread in the entire district. Cases have been reported in Lokung where an Elderly woman was killed and across the district, agricultural field and settlements were destroyed by fire. The ecosystems have been also affected trees in institutions, individual plantations; forest reserves have not been spared.

Figure 11: Human Epidemics Risk



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

The entire district is affected by diseases which are attributed to due to poor sanitation and hygiene caused by the concentration of the population in an area especially within the trading centres and also people from other parts of the district and south Sudan.

There are Cases of Nodding Disease Syndrome which is more pronounced in the sub county of Palabek Gem, and Hepatist B, Rabbies, Epilepsy reported in the rest of the sub county.

Vulnerability

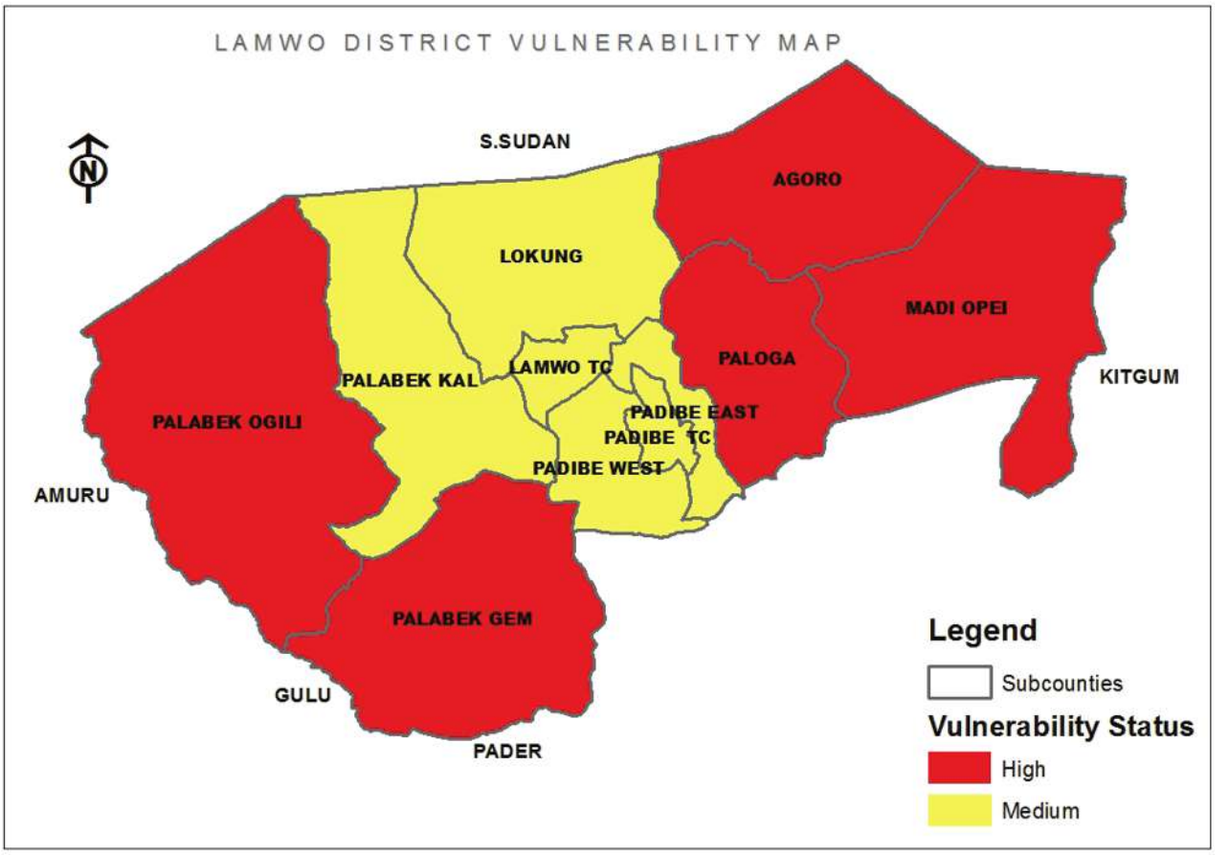
Table 7 summarizes the communities' assessment of hazard severity and frequency in the sun-counties. Table 8 transforms those qualitative low/medium/high judgements to numerical values 1/2/3 which when summed vertically show the relative risk per hazard. The horizontal sums show both cumulative and weighted vulnerability

Table 7: Risk and vulnerability assessment

Sub county	Hazards											Cumulative vulnerability (Absolute)	Weighted vulnerability (Cumulative/3)
	Floods	Prolonged Dry Spell	Vermin and problem animals	Crop pests and diseases	Animal Vectors and diseases	Environmental degradation	Internal conflict/Land conflict	Invasive weed species	Severe storms	Wild bush fires	Human epidemics		
Agoro	2	2	1	2	3	3	3	3	2	2	1	24	8
Lokung	3	1	1	2	2	2	3	2	2	2	1	21	7
Lamwo TC	1	1	1	2	2	2	2	2	1	2	1	17	6
Madi Opei	2	3	1	2	3	3	3	3	1	2	1	24	8
Paloga	3	3	2	2	3	3	3	3	1	2	2	27	9
Palabek Kal	3	2	2	2	2	2	2	2	1	2	2	22	7
Palabek Ogili	3	2	2	2	2	3	2	2	1	2	2	23	8
Palabek Gem	2	2	2	2	2	3	3	2	1	2	3	24	8
Padibe West	2	2	2	2	2	3	2	2	2	2	1	22	7
Padibe East	2	2	1	2	2	3	3	2	1	2	2	22	7
Padibe TC	2	1	1	2	2	3	2	3	1	2	1	20	7
TOTALS	**25**	**21**	**16**	**22**	**25**	**30**	**28**	**26**	**14**	**22**	**17**	**246**	
Key: 3 = High, 2 = Medium, 1 = Low, 0 = Not reported													

Risk Vulnerability

Figure 12: Risk Vulnerability Map



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

The vulnerability map in Figure 12 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.

Lamwo district is exposed to 11 hazards namely environmental degradation, internal conflict/ land conflict, invasive weed species, floods, animal vectors and diseases, crop pests and diseases, wild bush fires, prolonged dry spell, human epidemics, vermin and problem animals and severe storms arranged in their order of risk from highest to lowest with total risks of 30, 28, 26, 25, 25, 22, 22, 21, 17, 16, and 14 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.

As shown by both the table and map, Lamwo district is highly vulnerable to the resident hazards. Paloga, Agoro, Madi Opei, Palabek Gem and Palabek Ogili sub-counties reported the highest vulnerability in Lamwo district with cumulative vulnerability values of 27, 24, 24, and 23 respectively and weighted vulnerability values of 9, 8, 8, 8 and 8 respectively which lies in the top (red) category of the vulnerability scale as shown in the map above. The rest of the sub-counties displayed medium (yellow) vulnerability with weighted vulnerabilities between 5 and 7. Though still very vulnerable, Lamwo T/C displayed the least vulnerability in the district with a weighted vulnerability of 6.

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 Lamwo 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 Lamwo 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 Lamwo district is vulnerable to eleven hazards, in order of decreasing risk: environmental degradation, internal conflict/land conflict, invasive weed species, floods, animal vectors and diseases, crop pests and diseases, wild bush fires, prolonged dry spell, human epidemics, vermin and problem animals and severe storms

Paloga, Agoro, Madi Opei, Palabek Gem and Palabek Ogili sub-counties were the most vulnerable in Lamwo district with cumulative vulnerability values of 27, 24, 24, and 23 respectively and weighted vulnerability values of 9, 8, 8, 8 and 8 respectively which lies in the top (red) category of the vulnerability scale. The rest of the sub-counties displayed medium (yellow) vulnerability with weighted vulnerabilities between 5 and 7. Though still very vulnerable, Lamwo T/C displayed the least vulnerability in the district with a weighted vulnerability of 6. Though less vulnerable, it 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 Lamwo 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

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