



# **Amolatar District**

## **Hazard, Risk and Vulnerability Profile**



2016



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## ACRONYMS

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

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

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**Hon. Hilary O. Onek**

Minister for Relief, Disaster Preparedness and Refugees

## EXECUTIVE SUMMARY

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

The methodology provided for four phases of work:

- Phase I: Requirements analysis, work planning, team building, logistical arrangements
- Phase III: Data cleaning, analysis and verification
- Phase II: Stakeholder mapping, consultation, spatial data acquisition, secondary data assessment
- Phase IV: Dissemination workshop

The report characterizes the district in terms of, location, geography, gender demographics by sub-county and livelihoods Latitudes 1° 21'N, 2° 42"N, Longitudes 32° 51"E, 34° 15"E. The otherwise continental climate of the district is modified by the Lake Kyoga waters surrounding the district. The rainfall in the district is bimodal with one peak during April-May and the other in August-October. The district has a population of 127, 400 as of population projection of the year 2012.

Amolatar district is exposed to ten hazards namely environmental degradation, prolonged dry spell, animal vectors and diseases, flooding, crop pests and diseases, invasive species, bush fires, heavy storms, vermin, and human epidemic arranged in their order of risk from highest to lowest with total risks of 28, 22, 22, 18, 17, 9, 8, 6, 5 and 3 respectively.

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

The communities of Namasale, Etam, Awelo, Arwotcek and Aputi were the most vulnerable sub-counties in the district while those of Namasale T/C, Agkidak and Amolatar T/C sub-counties were the least vulnerable.

Much as the district is between moderate and high vulnerability levels, installation of early warning systems and other DRR interventions would still be able to enhance the resilience of the people of Amolatar to the effects of climate change.

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



## INTRODUCTION

Amolatar district is vulnerable to a number of hazards that lead frequently to disasters. They include; environmental degradation, prolonged dry spell, animal vectors and diseases, flooding, crop pests and diseases, invasive species, bush fires, heavy storms, vermin, and human epidemics.

The Amolatar 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 Amolatar 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 exercise is to produce a District Profile that will aid planning and decision making processes in addressing disaster threats/risks in Amolatar district.

### Methodology

The multi hazard, risk and vulnerability mapping exercise employed a people-centered, multi-sectoral, and multi-stakeholder approach. In generating the required information and production of the district profile, a mapping team led by the Office of the Prime Minister (OPM) and involving representatives from UNDP and district sector offices was deployed for a field mission to Lango region from 11<sup>th</sup> to 30 May 2014.

In collecting field data, the team employed a variety of methods including use of a mix-scale approach involving the integration of primary and secondary data. Secondary data were acquired through government sources (relevant Ministries, Departments and Agencies, the districts in Lango sub-region) and data bases from other organizations/NGOS operating in these districts. The raw spatial data and satellite images were assembled from relevant sources and analyzed with descriptive statistics and remote sensing technology.

The mapping exercise involved four (4) phases which are as follows;

Phase I: Preliminary Activities

Phase II: Field Data Collection & Mapping

Phase III: Data Analysis & Map Production and Report Writing

Phase IV: Refining and Final Map Production/Reporting

### **Phase I: Preliminary Activities**

This phase involved the mapping team undertaking a series of planning and programming activities before start of field activity including but not limited to; holding meetings with relevant teams, mobilizing required resources, acquisition of required equipment and materials, review of relevant literature, establish relevant contacts and a checklist of activities to be undertaken in Phase Two.

The main objectives of Phase One is to allow the mapping team to prepare and undertake preliminary assessment of the quality and nature of the resources/materials, develop a quick understanding and appreciation within the mapping team and also with various actors towards the task of the multi-hazard, risk, and vulnerability mapping before any detailed physical field work is undertaken. This phase enabled the scoping and adoption of specific mapping content/legend for the thematic maps.

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

### **Phase II: Field Data Collection and Mapping**

**Stakeholder mapping and local meetings;** A field entry meeting is held for each district that enabled the obtaining of key local issues that relate to disaster occurrence and changing trends. The meeting gave an opportunity for the mapping team and stakeholders to identify other key resource persons/support staff from within the local community to consult.

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

**Capture of spatial data;** spatial data were captured and complemented by base maps prepared at appropriate scales. The base maps contained relevant data including but not constrained to location of existing social-infrastructure and services, district area boundaries, environmental elements, forest areas, utilities like roads, drainage and river course, contours and flood prone settlements.

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

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

**Main instruments of data collection;** The main instruments used for data collection were; instruction manuals(guides to mapping assistants), use of key informant guides and notebooks, high resolution GPS receivers, a digital Camera for taking critical photographs, high resolution satellite images and base maps/topographic sheets of the mapping areas.

**Exit / feedback meetings with stakeholders;** after field activities and actual data collection, feedback and exit meeting with stakeholders were carried out in district. This exit meeting provided additional information regarding the disaster mapping exercise validated the data generated, and provided clarity on the expected out puts and way forward under this exercise.

### **Phase III: Data Analysis and Verification**

**Analysis of collected data;** the data collected was analyzed by the mapping team together with district local government officials. GPS coordinates were overplayed on top of the base maps and high resolution satellite images in developing the different disaster thematic maps.

The main activities at this phase include;-

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

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

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

**Data editing, coding and cleaning;** Data collected using the various tools mentioned above were edited, coded, and cleaned by data editors, coders and entrants. Both qualitative and quantitative data obtained from the field were entered via a data entry interface customized to the layout of the field data forms. Data coding and analysis started soon after information was secured from the field.

Arrangements were made in the field to handle manual editing and coding as and when data is received from the field crew. Furthermore, data entry, verification, screens editing and system development followed sequentially to enable the preparation of draft maps.

**Data analysis package** ; After data has been secured, it was analysed by the mapping team using windows-based package or MS office Processing Programs (MS Word, MS Excel for Windows) Spatial data was analysed using the latest ArcGIS software and mobile GIS applications. Rapid and systematic GIS overlays were performed to generate base maps and risk and vulnerability maps.

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

**Generation and appraisal of draft Maps**; thematic maps for the different hazards were developed based on the prioritization set by the districts. These risk and vulnerability maps were presented and validated appraised in a field workshop based on the accuracy and completeness of the information. Missing information gaps were identified and incorporated in the final risk and vulnerability maps.

#### **Phase IV: Dissemination Workshop**

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

## Overview of the District

### Location

Amolatar District is located in Northern Uganda and is bordered by the districts of Dokolo in the North-East, Kaberamaido in the East, Kayunga, Kamuli and Nakasongola in the South; and Apac in the North-West.

Physically, the district lies between: Latitudes 1° 21'N, 2° 42'N, Longitudes 32° 51'E, 34° 15'E. The district covers a total area of 1,581.77 km<sup>2</sup> (table below) of which approximately over 1,000 km<sup>2</sup> is land area.

**Table 1: Amolatar District Area Size in Km by Sub County**

No.	Sub-county	Area size (km <sup>2</sup> )
1	Muntu	426.16
2	Awelo	377.20
3	Namasale	524.18
4	Aputi	254.23
5	Amolatar Town Council	
	<b>District total</b>	<b>1,581.77</b>

### Administrative and Local Government Units

The district is composed of the following number of administrative units:

County	=	1
Sub-counties (including the Town Council)	=	10
Parishes (Functional including Town Council)	=	58
Villages (Functional including Town Council)	=	433

### Geology and Soils

There are three major geological formations in the district:

Basement complex (mainly undifferentiated acid gneiss) covering most of the district. Kyoga series mainly made of psyllites and quartzite. Pleistocene to recent sediments along the shores of Lake Kyoga

### Climate

The otherwise continental climate of the district is modified by the large Lake Kyoga waters surrounding the district. The rainfall in the district is bimodal with one peak during April-May and the other in August-October.

The average annual rainfall in the district varies between 1200-1600 mm decreasing northwards. The rainfall is mainly convectional and normally comes in the afternoons and evenings.

The average minimum and maximum are 22.5°C and 25.5°C, respectively. Absolute maximum temperature hardly goes beyond 36°C, and absolute minimum hardly falls below 13°C.

The Equatorial Trough which brings rainfalls passes over the district. The South easterly wind which also brings rains to the district passes over Amolatar. Land and sea breezes are common in the district. Wind run is low (1-4m/sec) during the rainy season and moderate (4-8m/sec) during the dry season.

### **Historical Background**

Amolatar district was formed in 2005 from the mother district Lira and became effective 1st July 2005. The seven districts of Amolatar, Lira, Dokolo, Otuke, Alebtong, Apac and Oyam together constitute the districts of Lango Sub-Region occupied by the Lango ethnic group.

The origin of the Lango is somewhat obscure but it is believed that they originated in Abyssinia in Ethiopia. They are considered to be part of the Nilo-Hamites (also known as semi-Hamitic) group, which includes the Teso, Kumam, Jie and Karamojong tribes. The Lango, in contrast of their fellows, have adopted the simpler Nilotic tongue. It is believed that their move from further North into the present habitat took place between the years 1800-1890 approximately.

Apart from times of wars, when some sort of cohesion was achieved under one or two war leaders, the Lango before the advent of British Administration in 1889, were divided into many small groups or clans each with its own leader, i.e. chieftainship. British Administration of the District dates back to 1900. Administration in the early days was in the hands of Buganda agents.

## ECONOMIC BACKGROUND

### Production System

The traditional economic/cash crop is cotton which, in recent years had been on decline but has picked up in the recent past mainly due to the liberalization and privatization policy of government. Some hitherto non-traditional economic crops have taken over the role of cotton. They are simsim, rice, maize, beans and millet. These crops are in high demand and they not only play their traditional role as food crops, but are nowadays cash crops as well. Rapidly coming up as economic crops are also cassava, potatoes, sunflower, soya beans, oranges and bananas (Matooke).

The economy in Amolatar is basically a subsistence economy with about 81% of the population engaged in subsistence farming. Industrialization is yet lacking and the only small cottage industries available are few grinding mills found in main trading centers. Being a peninsular surrounded by Lake Kyoga, fishing is the main economic activity in the district.

### Income levels

Poverty levels are high in Amolatar; over 67% of the populations are living below the poverty line, (hard core poor). Average household income is Ush. 170,000= per annum.

The main sources of household livelihood in Amolatar are subsistence Farming, fishing, Petty Trading, Formal Trading, Employment Income and Family Support.

### Demography

The district has a population of 127,400 as per the projection from 2012 National housing and population census and a detail of population per sub-County

**Table 2: Projected 2012 Population**

	2008	2009	2010	2011	2012
Male	56,100	56,700	59,600	61,400	63,200
Female	57,600	58,200	60,800	62,500	64,200
<b>Total</b>	<b>113,700</b>	<b>114,900</b>	<b>120,400</b>	<b>123,900</b>	<b>127,400</b>

*Source: 2002 Uganda Population and Housing Census and Sub National Projections Report, Northern Region 2008-2012 (UBOS)*

The district has a population of 96,189 as of census year 2002 and details of population per sub-County are as below.

**Table 3: Projected 2012 Population of Amolatar District by Sub County**

S/ No.	Sub County	2002					2010 Projection		
		Male	Female	Total	Households (HHs)	Average HH Size	Male	Female	Total
1	Aputi	11,041	11,586	22,627	4,406	5.1	13,800	14,600	28,400
2	Muntu	10,048	10,309	20,357	4,065	5.0	15,300	16,000	31,300
3	Namasale	9,610	8,818	18,428	4,342	4.1	12,000	11,100	23,100
4	Awelo	14,890	15,239	30,129	5,876	5.1	18,500	19,300	37,800
5	Town Council	2,239	2,409	4,648	948	4.9			
	Total	47,828	48,361	96,189	19,637	4.9	59,600	60,800	120,600

Source: 2002 Uganda Population and Housing Census and Sub National Projections Report, Northern Region 2008-2012 (UBOS)

## Livelihoods

### Agriculture

Both men and women participate in crop production, but the role of women is much greater than that of men, especially in weeding, processing and storage. Unfortunately very often women hardly take part in the decision-making process at the household level which is an area which is almost entirely controlled by men. Through gender mainstreaming it is, however, possible to increase production and productivity and guide farmers better to make profit, reduces crop losses in the field and post-harvest.

### Veterinary Sub-sector

Women and youth are playing a very important role in animal production. Despite this women have not seriously participated in workshops on production, partly because the department had not given enough attention to this aspect. Mobilization by community department, NGOs and the Department of Production is aimed at increasing the participation of women and youth in workshops and other extension activities. Although both men and women participate in animal production, the authority of ownership has in most cases remained with men. In order to reverse this, dominance by men, the community needs to be sensitized

### Entomology Sub-sector

Both women and men participate in entomological activities (vector control and bee-keeping). Men take greater active part in most of the activities.

In bee keeping most activities are carried out by men. Women come in during harvest and processing, but have very little say at marketing and decision making on the utilisation of funds accruing from sales of bees products. It is important that women are encouraged to participate in all those activities, and especially more in the decision making.



## **Trade and Industry**

There is a big gender disparity in ownership and control of commercial and industrial resources and enterprises. Most ventures are owned, controlled and managed by men who themselves make investment, marketing and administrative decisions. In such cases women if they are involved at all, implement the men's decisions.

Women, however, are involved in small market based enterprises-sale of fresh farm produce, fish, making and sale of garments, and some processed farm products like flour, and handcraft. An interesting enterprise that involves both sexes but on a segregated basis is beauty treatment and body care- men work on men and women work on women.

There is need to mobilize women and empower them to own, control and manage enterprises. Activities and budgets should be drawn affirmatively in this direction.

## **Fisheries**

Participation of women in this sub-sector is still low, 90% of the fishing crew, boat owners, fishermen, and boat makers are men because landing site committees had only men in their structures; this has affected the participation of women in decision-making in as far as the management of landing site is concerned.

The fisheries department is taking up affirmative action to ensure gender representation in the fishing industry. The Beach Management Unit Statute requires that 1/3 of the committee should be women the boat owners, laborers and fish mongers should have equal representation. This will take time since fisheries is largely a man-dominate industry.

## HAZARDS

**Table 4: Hazard status**

Hazard	Status	Sub County
Environmental degradation	Incidences of wetland encroachment, deforestation, sand mining, stone marram quarrying and overgrazing reported  Incidences reported	Namasale TC
		Namasale SC
		Awelo
		Agwingiri
		Arwotcek
		Aputi
		Etam
		Muntu
Flooding		Akwon
		Namasale TC
		Namasale SC
		Awelo
		Agwingiri
		Arwotcek
		Aputi
		Etam
		Muntu
		Akwon
		Amolatar T/C

Crop Pests and Diseases	Incidences of Cassava Brown Streak Disease reported	Namasale
		Namasale T/C
		Awelo
		Agwingiri
		Arwotcek
		Aputi
		Akwon
		Etam
		Amolatar T/C
	Incidences of Citrus Kangka reported	Agwingiri
		Arwotcek
		Namasale
	Incidences of Fruit Flies reported	Namasale
		Awelo
		Agwingiri
		Arwotcek
		Aputi
		Etam
		Akwon
		Amolatar T/C
	Incidences of caterpillars affecting Soya beans reported	Akwon
	Incidences of Variegated grass hoppers reported	Akwon
Prolonged dry spell	Incidences reported	All the sub counties
Proliferation of plant species	Incidences of Stringer weed reported	Awelo
		Akura
		Aputi
		Muntu

Animal Pests and Diseases	Incidences of African Swine Fever reported	Namasale
		Awelo
		Agwingiri
		Arwotcek
		Muntu
		Aputi
		Akwon
		Agikdak
		Etam
		Amolatar T/C
	Incidences of New Castle Disease among chicken reported	Namasale
		Awelo
		Agwingiri
		Arwotcek
		Aputi
		Akwon
		Etam
		Amolatar T/C
Vermin	Incidences of Velvet Monkeys destroying crops were reported	Namasale
		Agwingiri
Heavy Storms	Incidences reported	Namasale
		Namasale T/C
		Etam
		Agwingiri
		Awelo
Human Epidemic	Incidences of Hepatitis B reported	Aputi
		Amolatar T/C

Bush Fires	Incidences of massive fires reported	Namasale
		Awelo
		Agwingiri
		Arwotcek
		Aputi
		Akwon
		Etam
		Amolatar T/C

Table 4 displays the status and summarizes the nature of hazards in the district and provides the locations of instances. Table 5 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 ranks the hazards in their order of occurrence, frequency and magnitude. Their ranking reflects the perception of stakeholders of the relative severity of the corresponding impacts on them.

**Table 5: Summary of Hazards by Sub County**

SUB COUNTY	Environmental degradation	Flooding	Crop pest and diseases	Prolonged dry spell	Invasive species	Animal Vectors and diseases	Vermin	Heavy storms	Human Epidemic	Bush Fires	Vulnerability to Agg. risk/disaster
Namasale S/C	✓	✓	✓	✓	✓	✓	✓	✓			8
Namasale T/C	✓	✓	✓	✓		✓		✓			6
Etam	✓	✓	✓	✓	✓	✓		✓		✓	8
Agwingiri	✓	✓	✓	✓		✓	✓	✓		✓	8
Amolatar T/C		✓	✓	✓		✓			✓		5
Awelo	✓	✓	✓	✓	✓	✓		✓		✓	8
Arwotcek	✓	✓	✓	✓		✓				✓	6
Akwon	✓	✓	✓	✓	✓	✓				✓	7
Aputi	✓	✓	✓	✓	✓	✓			✓	✓	8
Muntu	✓	✓		✓	✓	✓				✓	6
Agikdak	✓			✓	✓	✓				✓	5
<b>TOTAL</b>	10	10	9	11	7	11	2	5	2	8	75

**Table 6: Ranking of hazards**

S/ No.	Hazard	Frequency (Most Freq=3, Freq=2, Not Freq=1)	Area (No. of sub counties) affected >10=5, 8-10=4, 5-7=3, 2-4=2, <2=1	Magnitude (High=3, Medium=2, Low=1)	Total (Sum of Columns 3,4 &5)	Rank (Ascending order)
1	Environmental Degradation (Deforestation, wet land degradation, overgrazing)	3	5	3	11	1
2	Floods/water logging	2	5	3	10	2
3	Crop pest and diseases	3	4	2	9	3
4	Animal Diseases (BQ, CBPP, F&MD)	2	3	3	8	4
5	Prolonged dry spell	2	5	1	8	4
6	Wild bush fires	1	4	2	7	6
7	Heavy Storms	2	3	2	7	6
8	Vermin	2	3	1	6	8
9	Invasive species	1	2	1	4	9
10	Human epidemic	1	1	1	3	10

### 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.

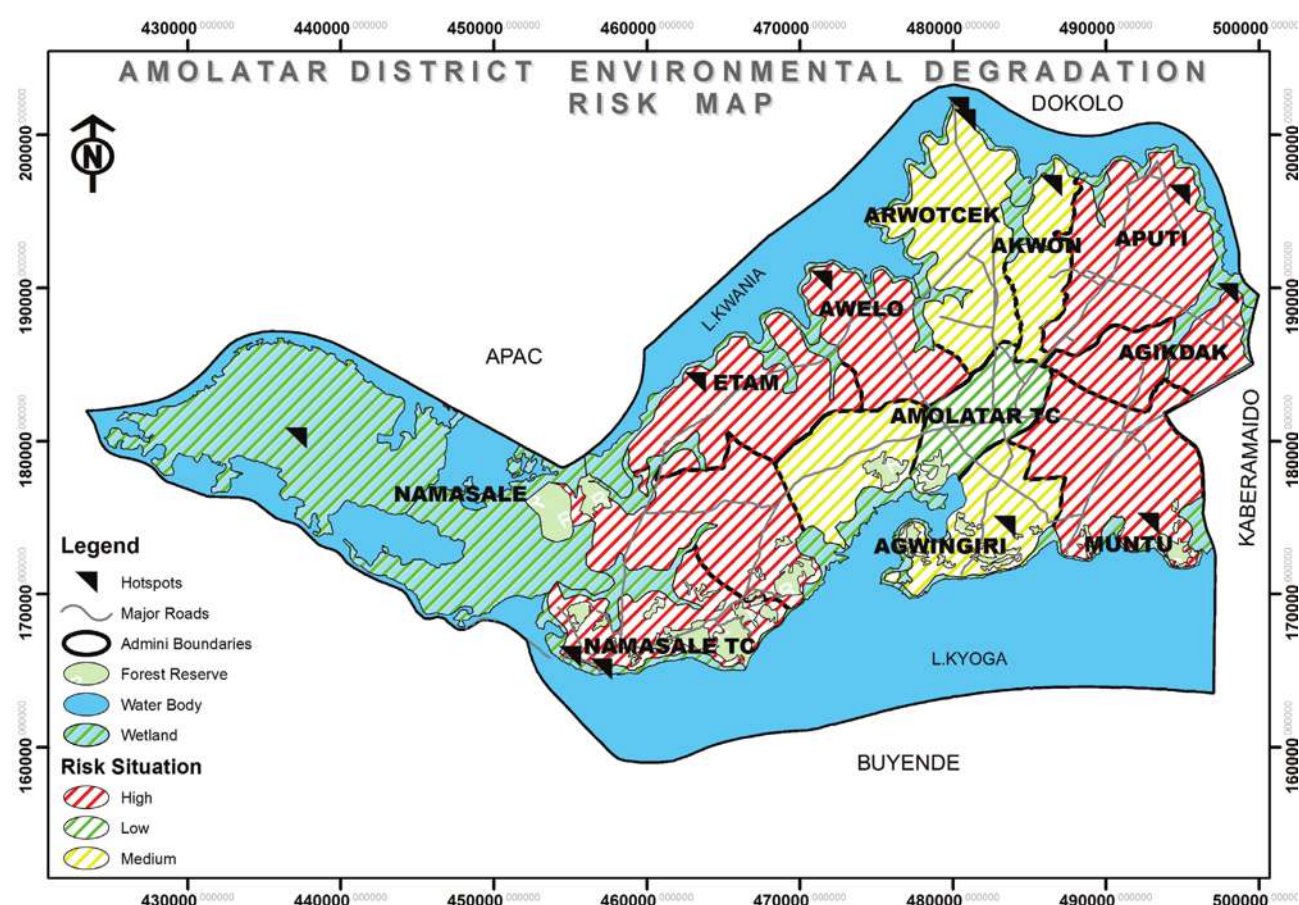
**Table 7: Hazard risk assessment**

SUB COUNTY	Environmental degradation	Flooding	Crop pest and diseases	Prolonged dry spell	Invasive species	Animal Vectors and diseases	Vermin	Heavy storms	Human Epidemic	Bush Fires
Namasale S/C	H	M	M	M	L	M	M	M	N	N
Namasale T/C	H	L	L	M	N	M	N	L	N	N
Etam	H	M	M	M	L	M	M	L	N	L
Agwingiri	M	L	M	M	N	M	L	L	N	L
Amolatar T/C	L	L	L	M	N	L	N	N	L	N
Awelo	H	M	M	M	M	M	N	L	N	L
Arwotcek	M	H	H	M	L	H	N	N	L	L
Akwon	M	L	H	M	L	M	N	N	N	L
Aputi	H	M	M	M	L	M	N	N	L	L
Muntu	H	M	N	M	L	M	N	N	N	L
Agikdak	H	N	N	M	L	M	N	N	N	L
Key: H = High, M = Medium, L = Low, N = Not reported										



## RISKS

### Environmental Degradation



**Figure 1: Environmental Degradation Risk Map**

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

Figure 1 above presents the risk status of environmental degradation in Amolatar District. Environmental degradation occurs when the natural state of the environment has been altered and the ecosystems have been destroyed. Ecosystems are fragile and once destroyed cannot be easily restored. In Amolatar, degradation has been a result of the following:

Poor method of farming practice in Agikdak sub-county, Namasale Town Council and the Sub-counties along the shores of Lake Kyoga and Kwanja; Over stocking of cattle especially in Muntu, Etam and Namasale sub county along the lakeshores of Kyoga and Kwanja; High dependence on wood fuel for domestic cooking, brick making and smoking fish. Forest product deflations are heavily experienced in both in local and central forest reserves. Shores of Kyoga in kayago, Namasale town council.

Land resources are becoming increasingly fragile. Vegetation cover is being degraded very fast because of the population pressure and opening up land for agricultural production.

This therefore means increase in soil erosion, unreliable and unpredictable rainfall and limited source of wood fuel and building materials.

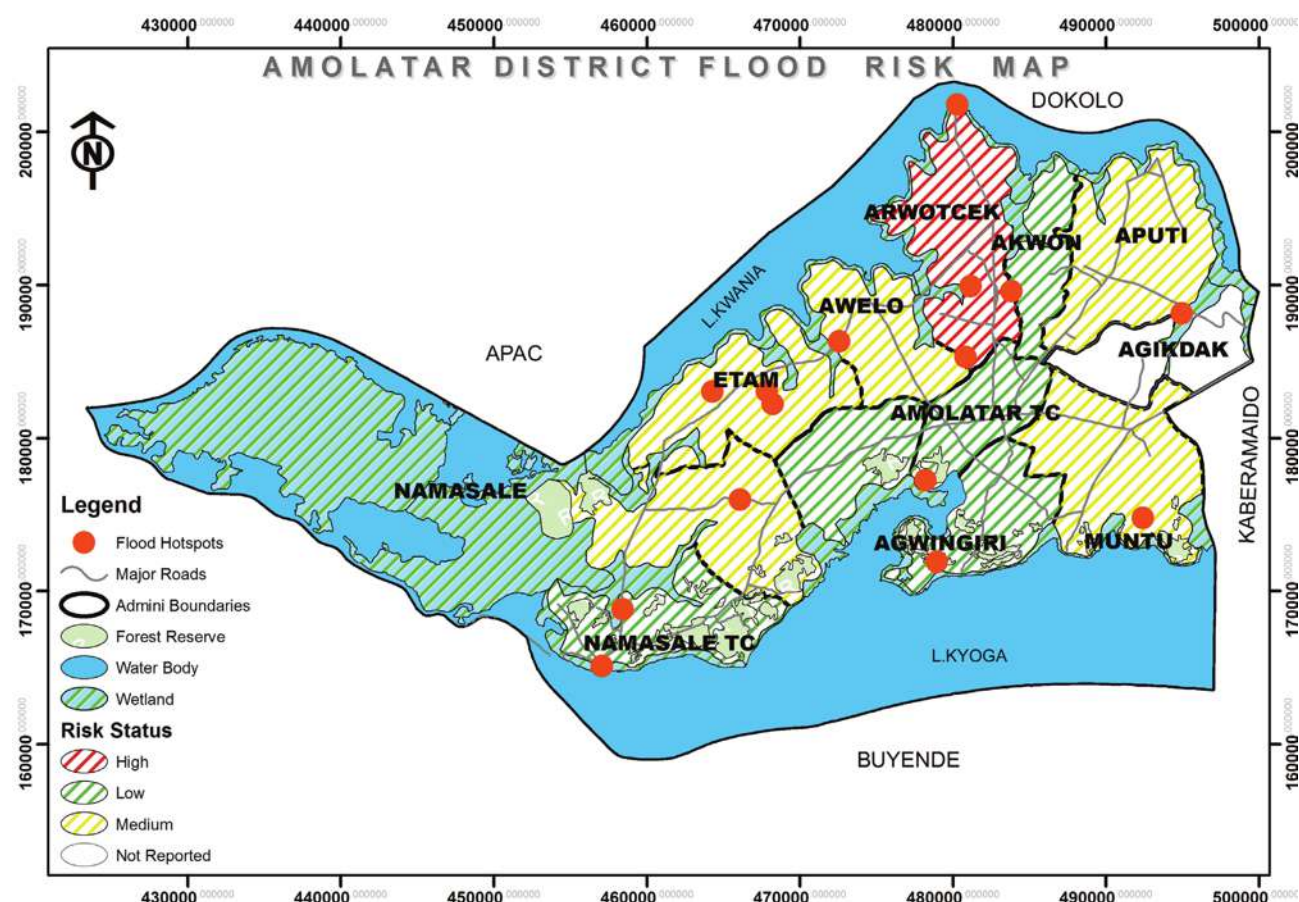
There is also reduction in agricultural production. The above activities are not in line with the principles of conservation of the environment, its management and sustainable development

Although there is debate on whether environmental degradation is a hazard or not, the impact of degradation is felt in the resultant flooding, soil erosion, climate change, etc.

Environmental degradation is a feature of the entire district in one form or another. Overgrazing, another form of environmental degradation has been recorded in Etam Sub-County.

Overall, the communities of Aputi, Agikdak, Muntu, Awelo, Etam sub counties and Namasale Town Council are prone to high risk of environmental degradation, while those of Namasale Sub County and Amolatar Town Council are prone to low risk of environmental degradation. All the other sub counties are prone to moderate risk of the hazard.

## Floods



**Figure 2: Flood Risk Map**

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

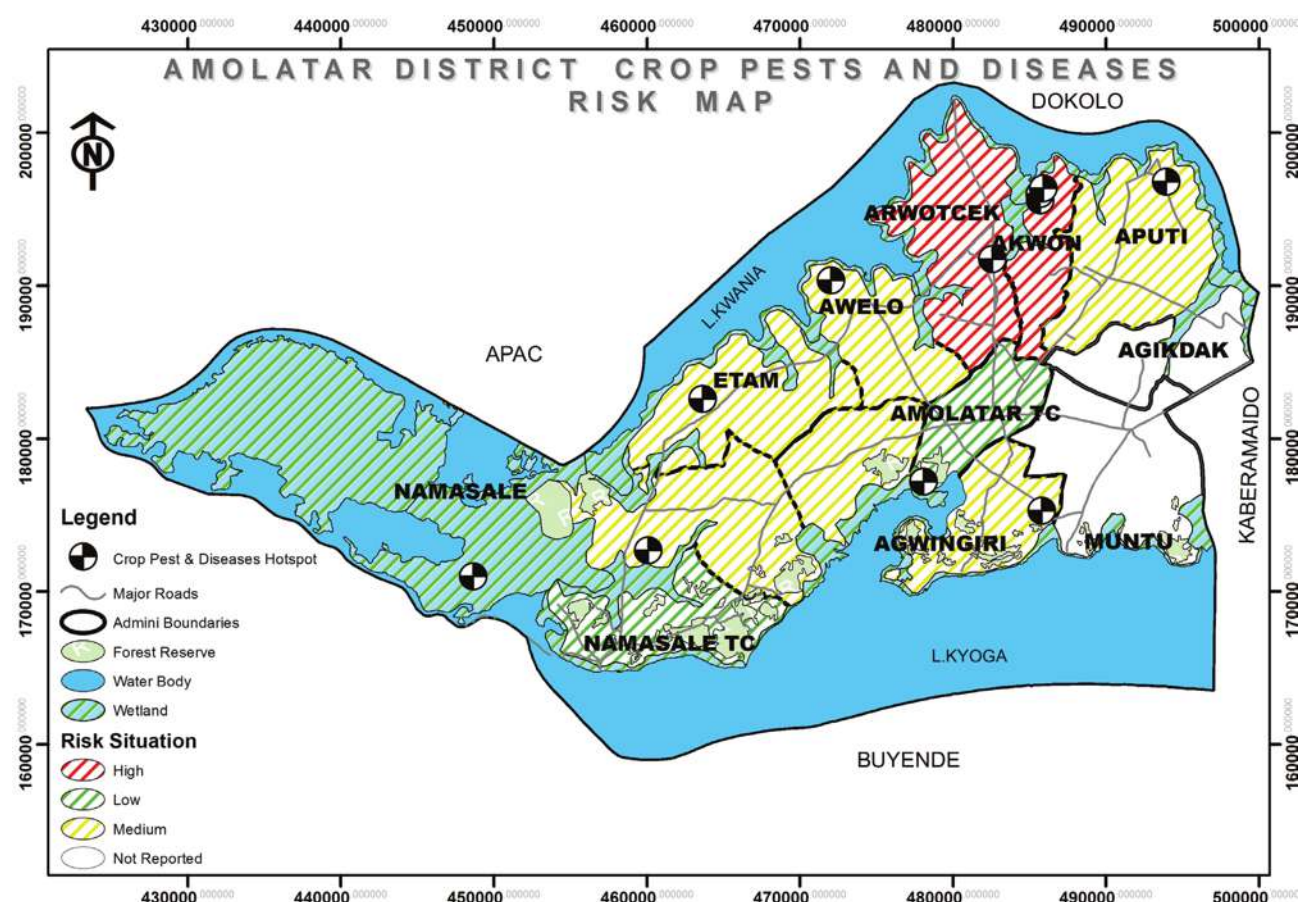
Figure 2 presents the risk status of floods in Amolatar District. Floods in the district are common along the shores of the Lake Kyoga and Lake Kwanja, floods sometime occur during periods of intense rainfall. Once floods occur, they cause a lot of damage by washing away structures, crops and even animal casualties and death may occur from drowning. In addition to the above, floods are followed by the outbreak of the diseases such as cholera, malaria and viral infections like hepatitis. Wells and ground water points are contaminated thus resulting in scarcity of clean and safe water for communities.

Water overflows wetlands and banks of Lake Kyoga and crossed the roads making them impassable. The latest episodes in Amolatar occurred in the year 2010-2011 when water overflowed the banks of Lakes Kyoga and kwanja and major wetlands in the district. This resulted into displacement of quite a number of people and blockages of several roads.

The communities most affected by floods are those of Arwotcek Sub-county who are prone to high risks; those of Namasale, Awelo, Aputi, Etam, Muntu sub counties are prone to moderate risk of floods. All the other sub counties and town councils are prone to low risk of floods.



## Crop Pests and Diseases



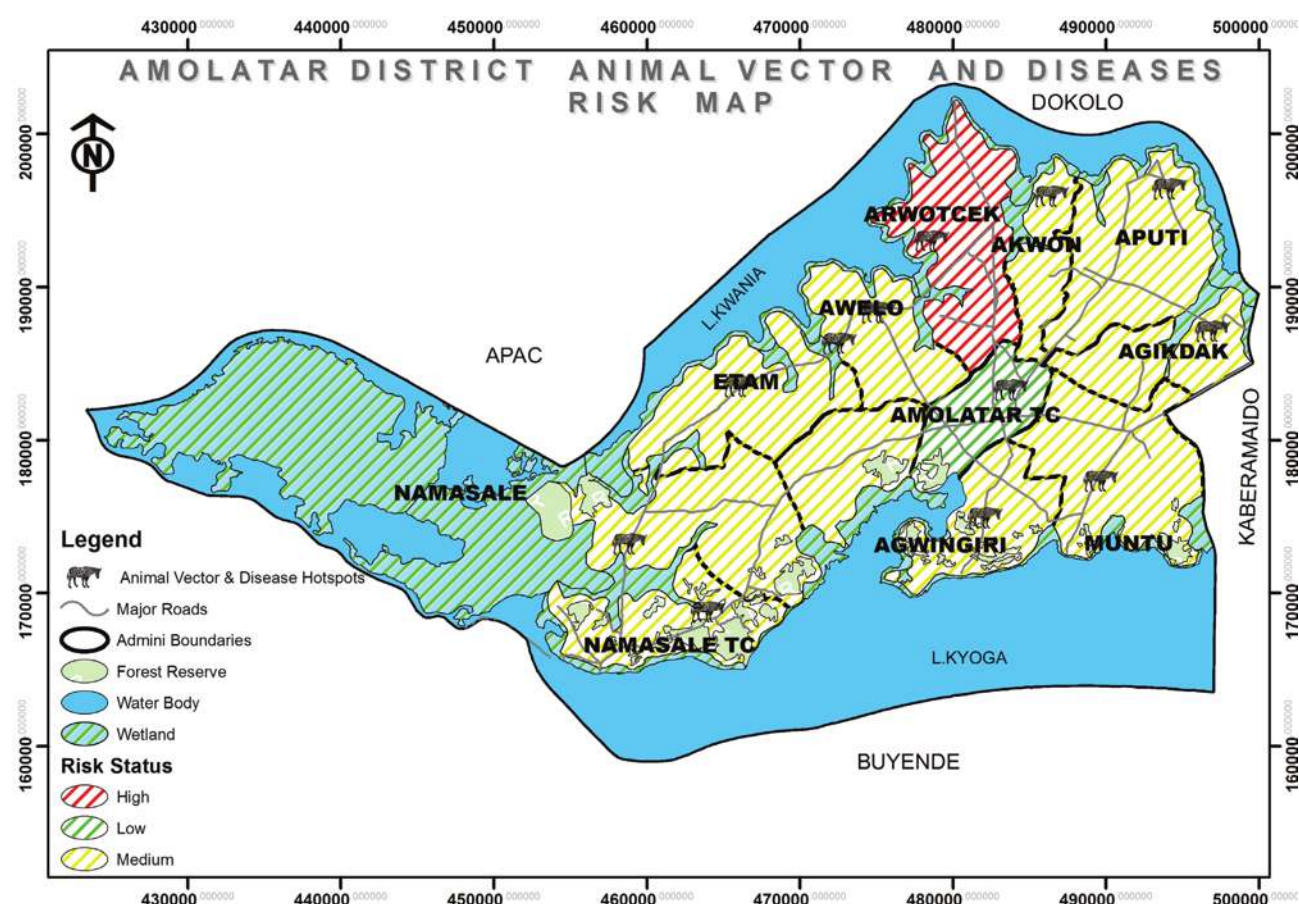
**Figure 3: Crop Pests and Diseases Risk Map**

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

Figure 3 depicts the crop pests and diseases risk status in Amolatar District. The incidence of cassava brown streak disease is at the top of the list, followed by citrus canker that affects citrus in Agwingiri, Akwon, Arwotcek and Etam sub-counties. Cassava brown streak and citrus canker have led to 100% loss of crops.

Overall, the communities of Arwotcek Sub County are the most affected and are prone to high risk of crop pests and diseases while those of Agikdak Sub County are not at any risk of crop pests and diseases. The rest of the sub counties and town councils are prone to moderate and low risks of the hazard.

## Animal Vectors and Diseases



**Figure 4: Animal Vectors and Diseases Risk Map**

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

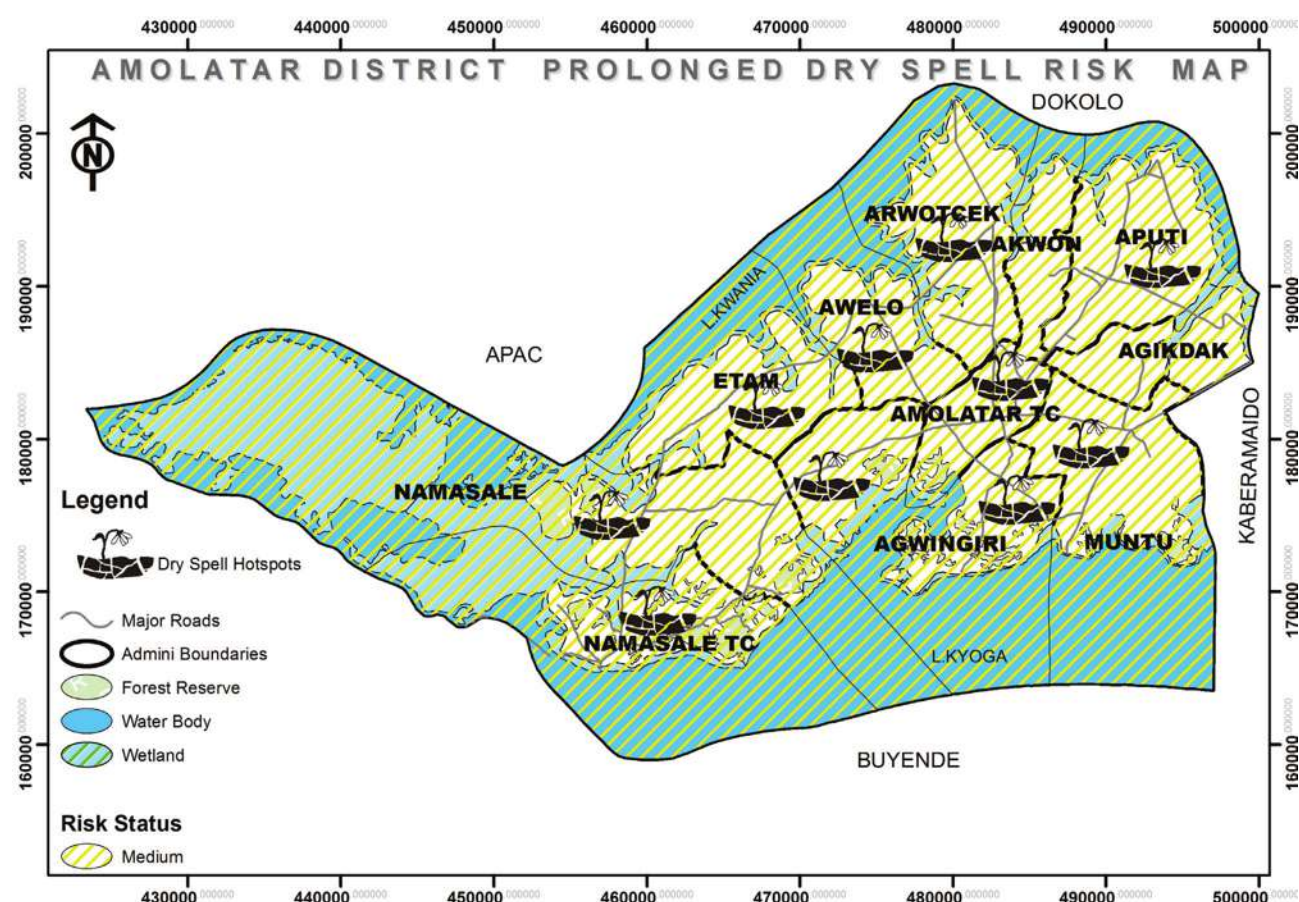
Figure 4 depicts the risk status of animal vector and diseases in Amolatar District. Incidences of animal diseases like tick borne diseases, endo-parasitosis and trypanosomiasis among animals and new castle disease among chicken are high in Akwon, Namasale, Arwotcek and Etam Sub County. With uncontrolled movements of livestock from neighboring districts, zoonosis becomes even a big threat. On other note a number of cases suspected to be rabies were reported as dogs were abandoned and left to go stray.

The dominant tsetse species is *Glossina fuscipes* and other vectors are nuisance-biting flies (tabanids, haemtopota, crysops and stomoxy). The distribution of the vectors is wide and infested areas include Lake Kyoga and Lake Kwanja basins, which has been infested from the neighboring district as Dokolo, Kaberamaido and Soroti.

In general, the communities of Arwotcek Sub County are prone to high risk of animal vector and diseases while those of Amolatar Town Council are prone to low risk of the hazard. All the other sub counties and town council are prone to moderate risk of animal vector nad diseases.



## Prolonged Dry Spell



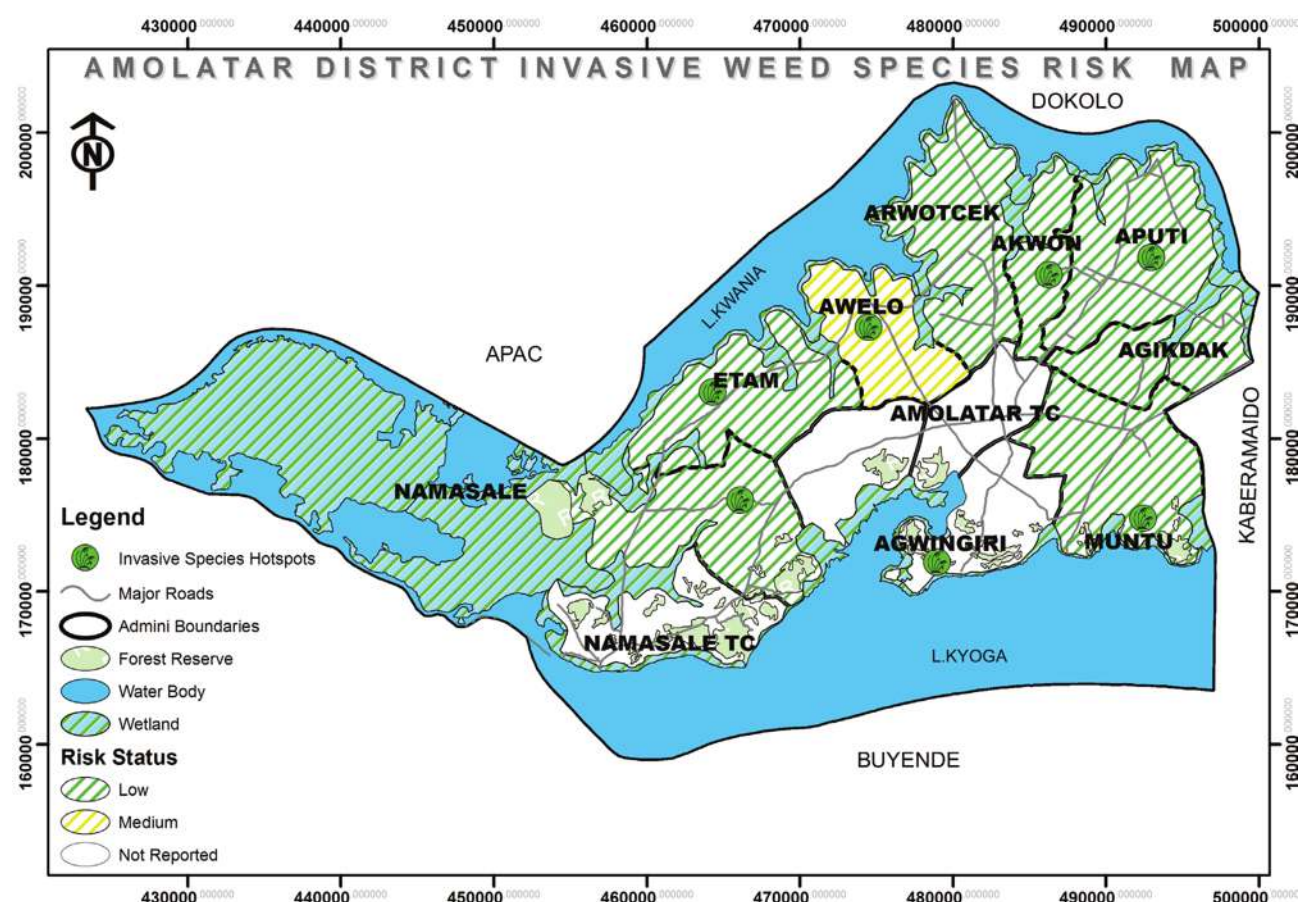
**Figure 5: Prolonged Dry Spell Risk Map**

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

Figure 5 shows the risk status of prolonged dry spell in Amolatar District. Prolonged dry spell is one of the forms of weather variability which could be one of the manifestations of climate change. Though at the local level, the micro climate could have been modified by some of the human activities like deforestation, wetland reclamation, poor agricultural practices (which encourage excessive soil moisture loss), rampant bush burning and to a limited extent by greenhouse gases. Dry spells lead to crop failures especially in the first planting season, food shortages and malnutrition in children.

Prolonged dry spell is a widespread phenomenon in Amolatar District whereof all the communities are prone to moderate risk of the hazard.

## Invasive Weed Species



**Figure 6: Invasive Weed Species Risk Map**

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

Figure 6 depicts the risk status of invasive weed species in Amolatar District. the communities of Awelo Sub county are most affected by the invasive weed species and are prone to moderate risk of the hazard, while those of Agwingiri Sub County, Amolatar and Namasale town councils are the least affected, they are not prone to the risks of invasive weed species. The rest of the sub counties are prone to low risk of the hazard.

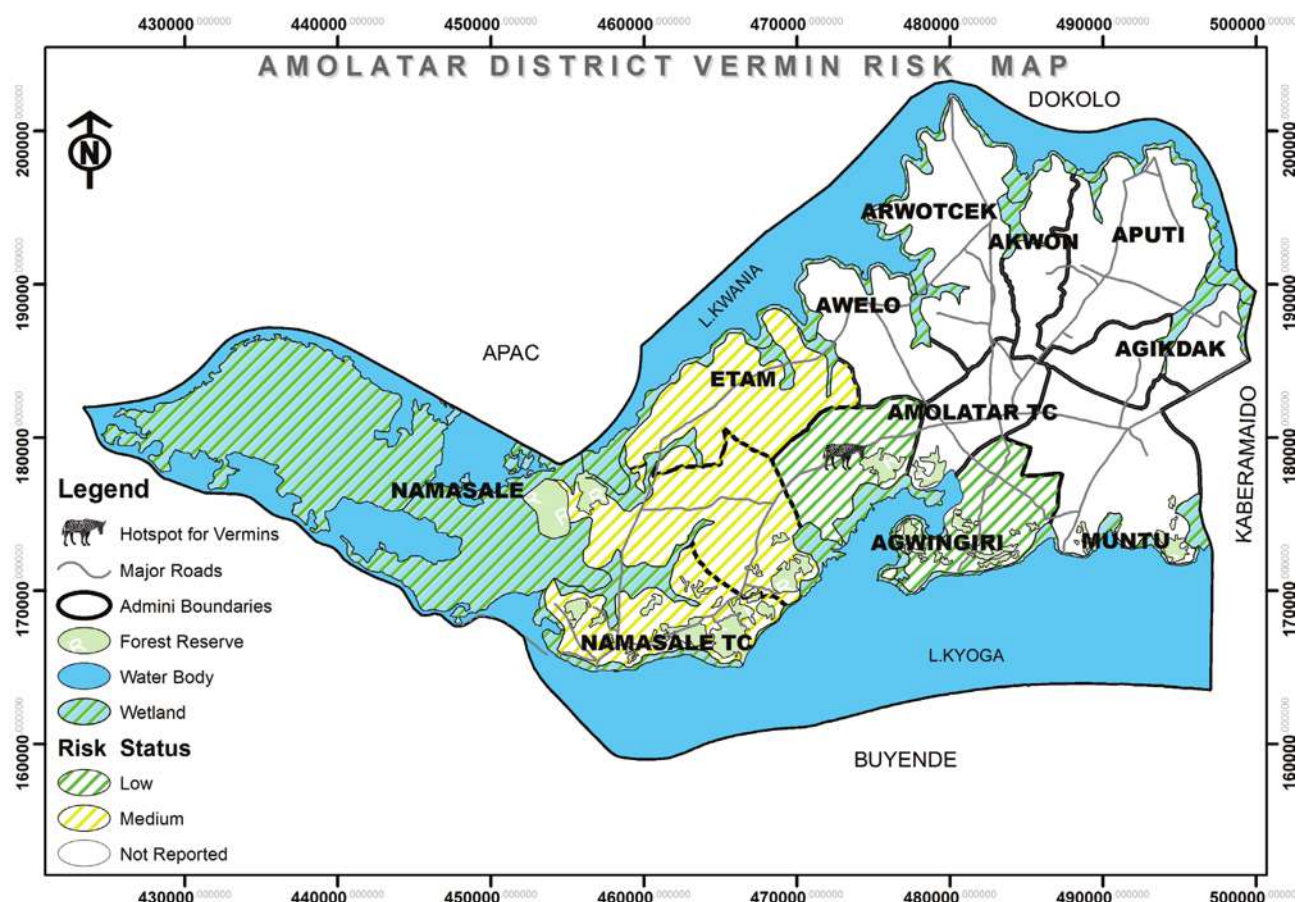
The most common invasive weed species in Amolatar district are: Striga (Witch weed) is common in areas where cereals are grown; crops like maize, millet, sorghum are affected so much by this weed leading to in most cases over 80% loss of harvest. The weed causes stunted growth in these crops leading to no yields at all. Cases of striga are reported in Awelo, Etam, Muntu, Akwon, and Namasale Sub-Counties.

Also Lake Kyoga and Kwania have been invaded by water hyacinth (*Eichhornia crassipes*) and this is bringing about changes in the biodiversity of fresh water resources resulting to the destabilization of water and its ecosystem.

The invasion also results in water quality degeneration in a number of ways namely; The free flow of water is interrupted leading to accumulation of pollutants at some points in the course of the water bodies; the hyacinth curtails the free flow of air into and out of the water bodies which may lead to deaths of water micro and macro organism which rot and pollute the water. The weed also causes pollution of the water bodies as they decompose.



## Vermin



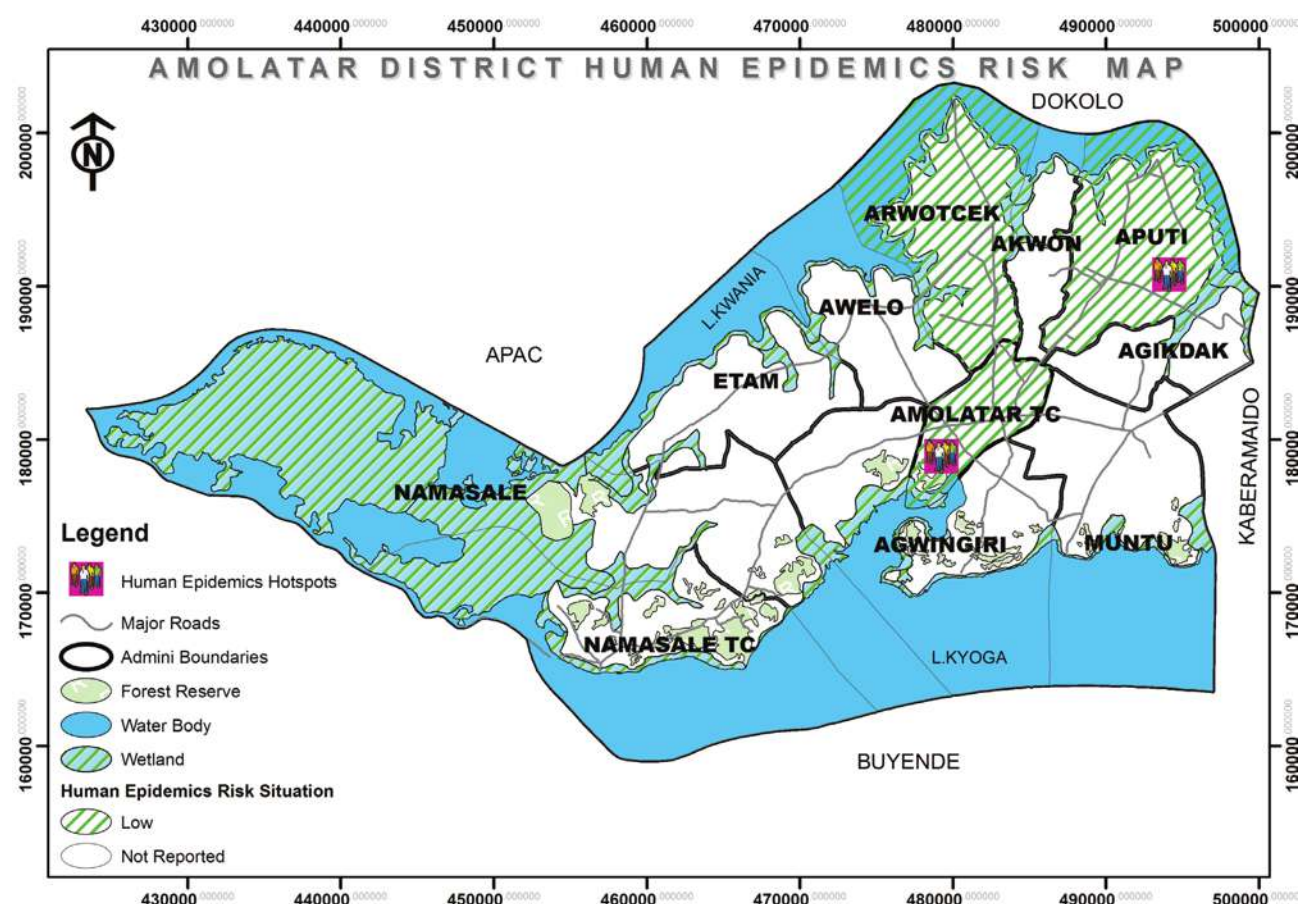
**Figure 7: Vermin Risk Map**

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

Figure 8 presents the risk status of vermin in Amolatar district. In Amolatar District, Wildlife do wreck havoc on crops especially Velvet Monkeys are known for destroying crops like cassava, maize and ground nuts in the Sub-Counties of Agwingiri, Muntu, Etam and Namasale. Rodents and birds are destroying crops like maize, peas and groundnuts. These animals are seen as nuisance to the community, cases have been reported from the sub counties of Agwingiri, Namasale and Etam along the shores of Lake Kwanja and Kyoga.

In general, Etam and Namasale sub counties are prone to moderate risk of vermin while Agwingiri and Namasale sub counties are prone to low risk of the hazard. The rest of the district is not prone to any risk of vermin.

## Human Epidemics



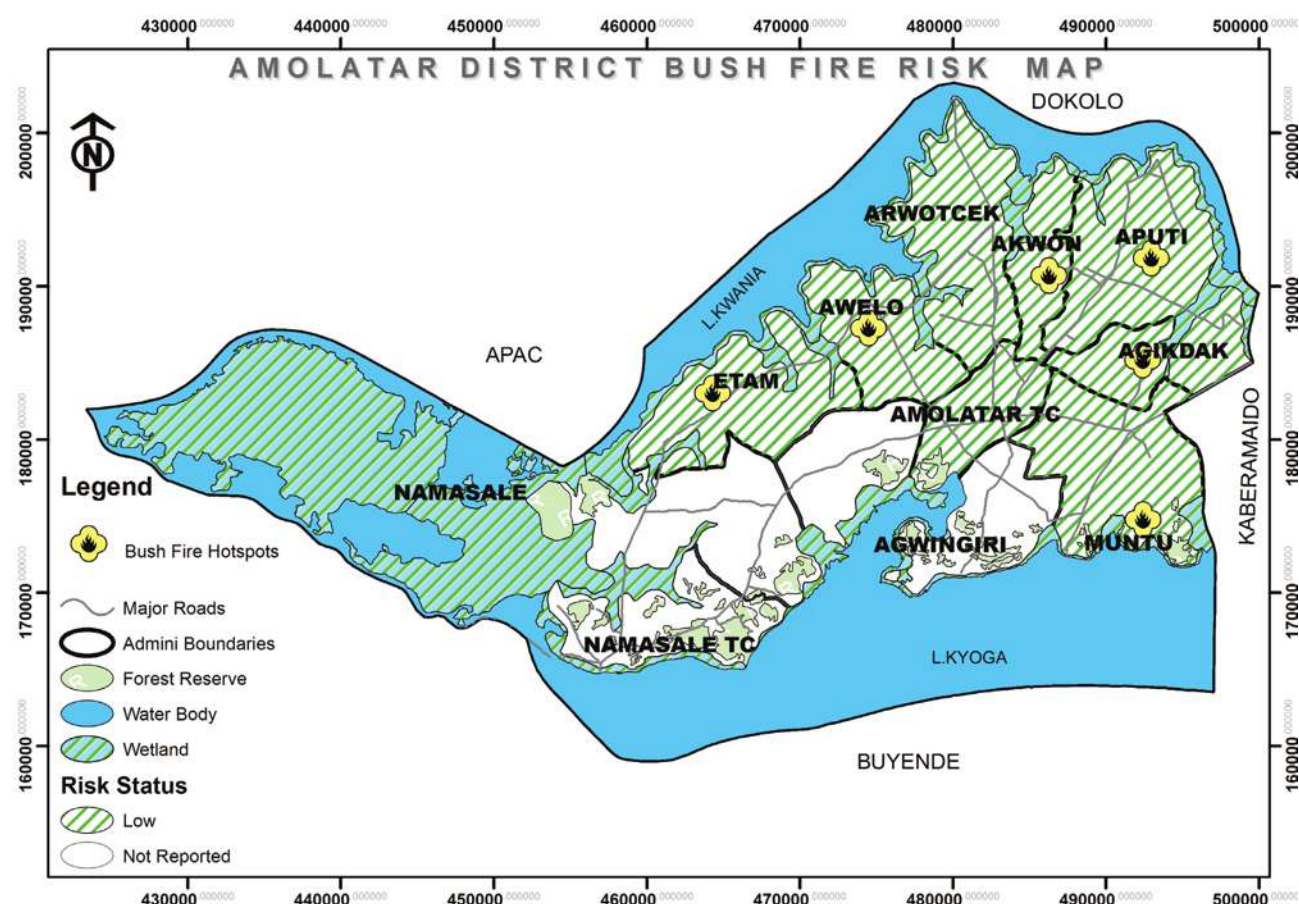
**Figure 8: Human Epidemics Risk Map**

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

Figure 8 depicts the risk status of human epidemics in Amolatar District. The District is experiencing a marked upsurge in the occurrence of highly infectious and fatal disease of 'Hepatitis B'. The disease which has a high prevalence rate in northern Uganda (20-30%) is transmitted through similar media like HIV, though it can be transmitted through all body fluids of an infected person including saliva and sweat. It was reported in Amolatar Town Council in 2013 and a couple of cases were reported in Aputi Sub-County in 2012 and 2013. However, due to the poor health seeking behavior of the local people, cases of deaths have not been well documented in the District health facilities.

The hazard is rather localized to three sub counties of Arwotcek, Aputi and Amolatar Town Council which are prone to low risk of human epidemics. The rest of the sub counties and town council are not prone to any risk of the hazard.

## Bush Fires



**Figure 9: Bush Fires Risk Map**

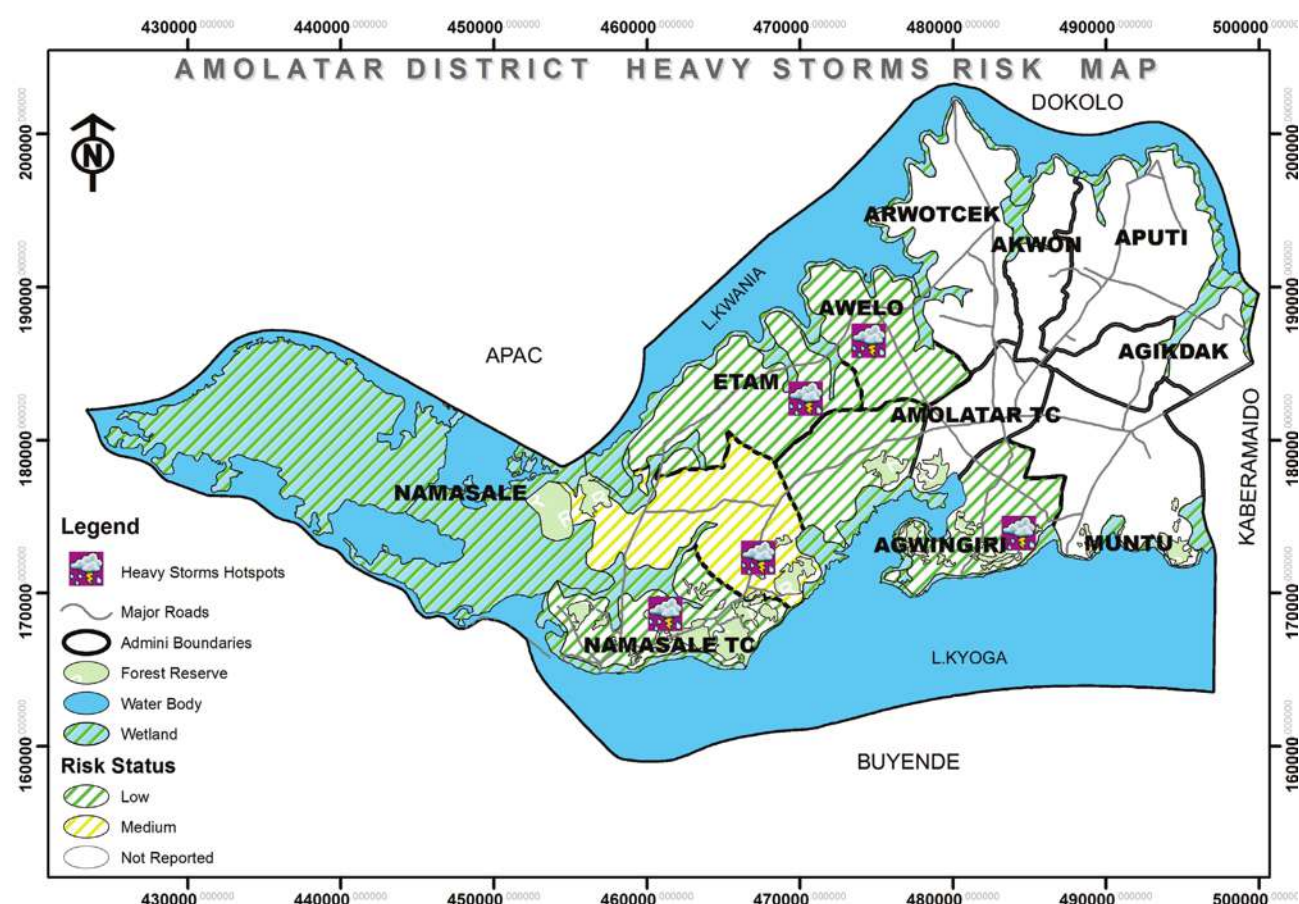
*Source: Field Data Collected by OPM (May, 2014)*

Figure 9 presents the risk status of bush fires in Amolatar District. Apart from Agwingiri, Namasale Sub counties and Namasale Town Council, which are not prone to any risk of bush fires; the rest of the district is prone to low risk of bush fires.

During dry season, local people always set bush fire for hunting and fishing activities and this has affected Different savannah vegetation type's cover of Amolatar District. There are no thick-forested areas as it used to be the case in the recent past. Forest estates only cover a small percentage of the total land area of the district. Ten years ago the savannah vegetation was mainly woodland, but slowly it's turning into grassland as woody component gets extracted for wood fuel, and getting burnt down. Massive fires have been reported in the sub county of Etam, Namasale, Aputi, Akwon, Muntu, Awelo .



## Heavy Storms



**Figure 10: Heavy Storms Risk Map**

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

Figure 10 presents the risk status of heavy storms in Amolatar District. Three major hazards have been categorized under heavy storms namely Hailstorms, strong winds and Lightning. Hailstorms are very common in Amolatar District causing severe damage to the crops, death of Animals and birds. It occurs mainly in the Sub-Counties of Namasale T/C, Namasale S/C, Etam and Awelo. Strong winds are also prevalent in the District, attributed to vegetation cover denudation that has resulted in reduction of tree cover in the district leaving large areas of land exposed and vulnerable to the impacts of strong winds. The hazard always results in blowing off of roofs of private houses and institutional buildings like school classrooms, health centers. Crops that grow tall are also equally affected and have always been broken down. The incidences of strong wind are pronounced throughout the district, with more devastating effects in Namasale Town Council, Namasale Sub County, Etam Sub-County, Awelo Sub-County and Agwingiri Sub-County.

Overall, the communities of Namasale Sub County are the most affected by heavy storms and are prone to moderate risks, while those of Namasale Town Council, Etam, Awelo and Agwingiri Sub Counties are prone to moderate risks. The rest of the sub counties and town council are not prone to any risk at all.

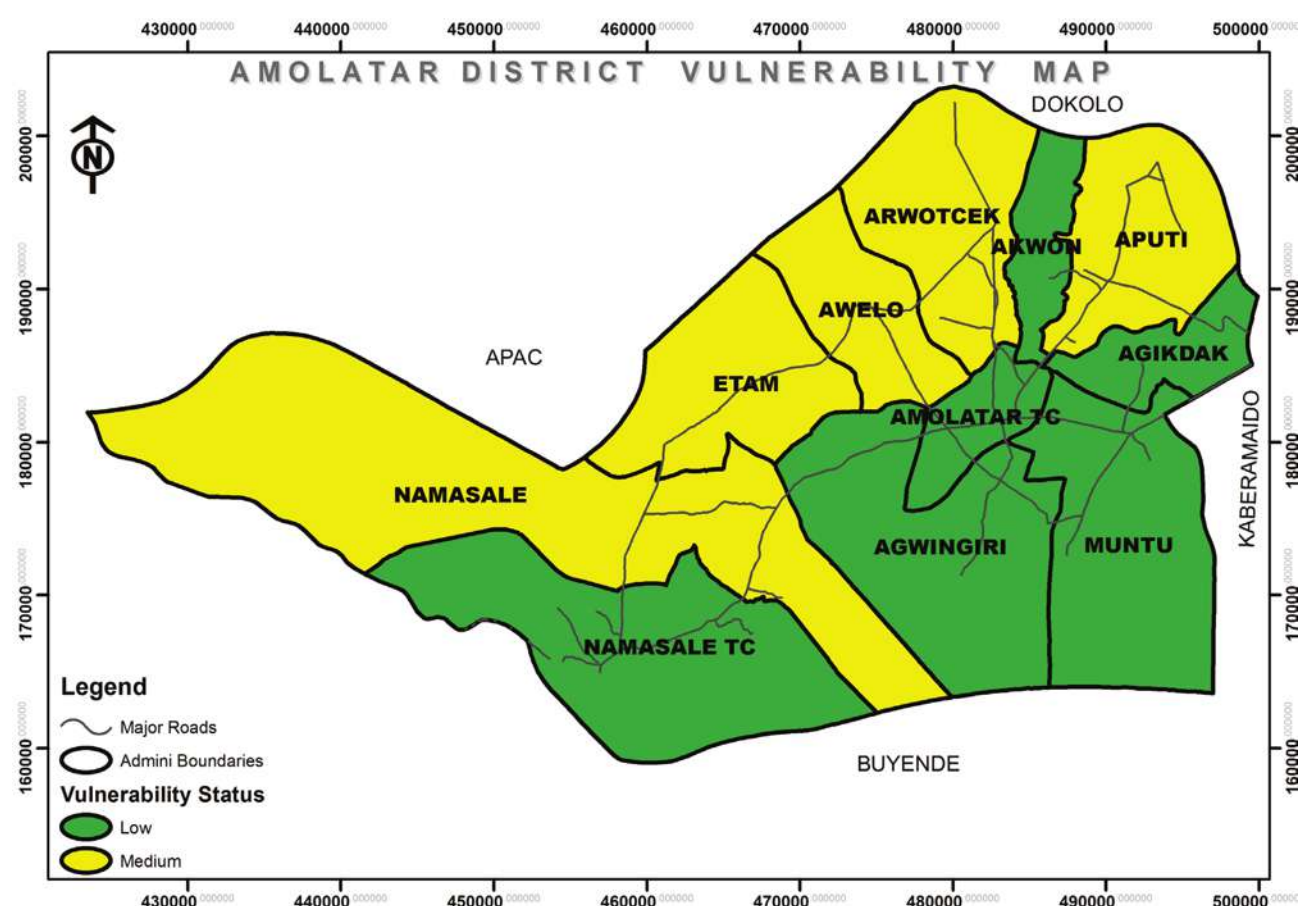
## VULNERABILITY

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 8: Risk and vulnerability assessment**

SUB COUNTY	HAZARDS										Cumulative vulnerability (Absolute)	Weighted Vulnerability (Cumulative/3)
	Environmental degradation	Flooding	Crop pest and diseases	Prolonged dry spell	Invasive species	Animal Vectors and diseases	Vermin	Heavy storms	Human Epidemic	Bush Fires		
Namasale S/C	3	2	2	2	1	2	2	2	0	0	16	5
Namasale T/C	3	1	1	2	0	2	0	1	0	0	10	3
Etam	3	2	2	2	1	2	2	1	0	1	16	5
Agwingiri	2	1	2	2	0	2	1	1	0	1	12	4
Amolatar T/C	1	1	1	2	0	1	0	0	1	0	7	2
Awelo	3	2	2	2	2	2	0	1	0	1	15	5
Arwotcek	2	3	3	2	1	3	0	0	1	1	16	5
Akwon	2	1	3	2	1	2	0	0	0	1	12	4
Aputi	3	2	2	2	1	2	0	0	1	1	14	5
Muntu	3	2	0	2	1	2	0	0	0	1	11	4
Agikdak	3	0	0	2	1	2	0	0	0	1	9	3
<b>TOTAL</b>	<b>28</b>	<b>17</b>	<b>18</b>	<b>22</b>	<b>9</b>	<b>22</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>8</b>	<b>138</b>	
Key: 3 = High, 2 = Medium, 1 = Low, 0 = Not reported												

## Risk Vulnerability



**Figure 11: 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.

Amolatar district is exposed to 10 hazards namely environmental degradation, prolonged dry spell, animal vectors and diseases, flooding, crop pests and diseases, invasive species, bush fires, heavy storms, vermin, and human epidemic arranged in their order of risk from highest to lowest with total risks of 28, 22, 22, 18, 17, 9, 8, 6, 5 and 3 respectively. These are worsened by poor practices that include building houses close to rivers, lack of protective embankments/walls, constructing houses with weak designs, and deforestation of slopes with poor soils.

Namasale, Etam, Awelo, Arwotcek and Aputi sub-counties reported the highest vulnerability in Amolatar district with cumulative vulnerabilities of 16, 16, 15, 16 and 14 respectively and weighted vulnerabilities of 5 each which lies in the middle (yellow) of the vulnerability scale. The rest of the sub-counties displayed low (green) vulnerability with weighted vulnerabilities well below 5. Namasale T/C, Agkidak and Amolatar T/C sub-counties were the least vulnerable sub-counties in the district with a weighted vulnerability values of 3, 3 and 2 respectively. Agwingiri sub-county though with a weighted vulnerability of 4 thus displaying medium vulnerability, is fast keeping pace at the vulnerability scale.

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

## CONCLUSION

This multi hazard, risk and vulnerability profile for Amolatar 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 Amolatar 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 Amolatar district is vulnerable to ten hazards, in order of decreasing risk: environmental degradation, prolonged dry spell, animal vectors and diseases, flooding, crop pests and diseases, invasive species, bush fires, heavy storms, vermin, and human epidemic.

Namasale, Etam, Awelo, Arwotcek and Aputi are the most vulnerable sub-counties with a weighted vulnerability of 5 each, all lying in the middle (yellow) of the vulnerability scale. The rest of the sub counties are less vulnerable to the resident hazards with weighted vulnerabilities well below 5 but should be fortified against occurrences of new hazards and exacerbation of resident hazards now occurring at lower magnitudes but which may be worsened by climate extremes expected in the near future. Namasale T/C, Agkidak and Amolatar T/C sub-counties were the least vulnerable sub-counties in the district with weighted vulnerability values of 3, 3 and 2 respectively.

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

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



## DEFINITION OF TERMS

**Prolonged dry spell.** This 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.

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

**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, and 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.

**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.

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

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



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