THE REPUBLIC OF UGANDA

Adjumani District
Hazard, Risk and Vulnerability Profile

2016

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Acronyms

DDMC   District Disaster Management Committee

DRM   Disaster Risk Management

FGD   Focus Group Discussion

GIS   Geographical Information System

GOU   Government of Uganda

GPS   Global Positioning System

LC   Local Council

NGO   Non-Governmental Organization

OPM   Office of the Prime Minister

SC   Sub-County

TC   Town Council

UNDP   United Nations Development Programme

Acknowledgement

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Minister for Relief, Disaster Preparedness and Refugees

Executive Summary

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

The methodology provided for four phases of work:

Phase I   Preliminary activities

Phase II   Field data collection, mapping, verification and ground truthing

Phase III   Participatory data analysis, mapping and report writing

Phase IV   Refinement, validation and final map production/reporting

The report characterizes the District in terms of location, geography, land use, livelihoods and gender demographics by Administrative Unit.

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.

Adjumani District is located in the North western region of Uganda, between altitudes 31°24" and 32°4" east of Greenwich line; and longitudes 2°53" and 3°37" North of the Equator. The District lies on the eastern bank of the Albert Nile, which is its common border with Moyo District. It borders the Districts of Amuru in the South and East, Arua and Yumbe in the West, and Moyo in the North.

Adjumani district is exposed to 14 hazards namely human disease/epidemics, crop diseases, animal diseases, prolonged drought/food insecurity, bush burning, floods, suicide hailstorms & lightning, strong winds, refugees influx, environmental degradation, land conflicts, invasive species of weeds and problem wild animals.

Bush fires, environmental degradation, land conflicts, refugee influx and floods were ranked as the most widespread and disastrous of the fourteen hazards.

All sub-counties reported a high level vulnerability with a weighted vulnerability of 8 and above which lies at the top (red) of the vulnerability scale but should be fortified against occurrences of new hazards 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 Adjumani to the effects of climate change.

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

Definition of Terms

Drought. Drought is the prolonged shortage of water usually caused by lack of rain. Drought and famine are related because crop and livestock productivity suffer in droughts.

Food insecurity. Food Insecurity is the severe shortage of food that may lead to malnutrition and death.

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

Landslides. These are rapid movements of large mass of mud, rocks, formed from lose soil and water. Landslides occur mainly during the rainy season, but they can also be precipitated by earthquakes. Community settlement on steep slopes and other uncontrolled land use practices increase the probability of landslides.

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

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

Crop and animal epidemics. Animal epidemics include swine fever, foot and mouth disease, nagana, and bird flu. Crop disease epidemics include coffee wilt, banana bacterial wilt, 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.

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

Adjumani District Local Government and the Department of 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 the 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 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 Adjumani District.

Methodology

The multi-hazard, risk and vulnerability mapping approach employed a people-centered, multi-sectoral, and multi-stakeholder approach. A mapping team led by the Office of the Prime Minister (OPM) and involving representatives from UNDP and district sector offices deployed on a field mission to Rwenzori sub-region to capture the required information and produce the district profile.

The team employed a variety of data-collection methods including use of a mix-scale approach involving the integration of primary and secondary data. Secondary data were acquired through Government sources (relevant Ministries, Departments and Agencies, the Districts in Rwenzori 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 analysed with descriptive statistics and remote sensing technology.

The mapping exercise involved four critical phases as follows:

Phase I	Preliminary activities
Phase II	Field data collection, mapping, verification and ground truthing
Phase III	Participatory data analysis, mapping and report writing
Phase IV	Refinement, validation and final map production/reporting

Phase I: Preliminary Activities

In this phase the mapping team undertook a series of planning and programming activities before start of field activity including holding meetings with relevant teams, mobilizing required resources, acquiring required equipment and materials, review of relevant literature, establishing relevant contacts and developing a checklist of activities to be undertaken in Phase Two.

The main objectives of Phase One were to prepare and undertake preliminary assessment of the quality and nature of the resources/materials, develop a quick understanding within the mapping team and other actors of the task of the multi-hazard, risk, and vulnerability

mapping before any detailed physical field work was undertaken. This phase enabled the scoping and design of specific content and legends for the thematic maps.

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

Phase II: Field Data Collection and Mapping

Stakeholder mapping and local meetings.

A preliminary field meeting was held in each district to capture key local issues related to disaster incidence and trends. The meetings gave opportunities for the mapping team and stakeholders to identify other key resource persons and support staff from within the local community for consultation.

Stakeholder Participation Practices.

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

Capture of spatial data.

Spatial data were captured and complemented by base maps prepared at appropriate scales. The base maps contained relevant data including location of existing social-infrastructure and services, district area boundaries, environmental elements, forest areas, utilities like roads, drainage and river course, contours and flood prone settlements.

Secondary data or desktop research.

A desk review of relevant documents at the district and other umbrella organizations, including policy and legal documents, previous maps/report and studies, was conducted. A checklist summarized the required information according to the multi-disaster risk indicators being studied/mapped. Data from documents were analysed using various methods including content analysis.

Critical observation and ground truthing.

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

Main instruments of data collection.

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

Exit/feedback meetings with stakeholders.

After field activities and data collection, feedback and exit meetings with stakeholders were carried out in the District. These meetings provided additional information regarding the disaster mapping exercise, validated the data generated, and provided clarity on the expected outputs and the way forward into the next phase.

Phase III: Data Analysis and Verification

Analysis of collected data. The mapping team and district government officials analysed the collected data, and developed thematic disaster maps by integrating features generated from GPS data with base maps and high resolution satellite images. The main activities at this phase included:

Data entry, cleaning and coding

Preparation of base maps and process maps

Preparation of disaster risk and vulnerability maps

Methods used for data analysis.

Data analysis methods used are the following:

Geo-processing, data transformation and geo-referencing

Discussions/FGDs

Drafting, digitizing and GIS Overlays

Compiling of different data and information

Data editing, coding and cleaning.

Data entry clerks, data editors and coders digitized, edited, coded and cleaned data collected using the various tools mentioned above. Both qualitative and quantitative data obtained from the field were entered via a data entry interface customized to the layout of the field data forms. Data coding and analysis started immediately the data was available. Arrangements were made in the field to handle manual editing and coding as and when data was received from the field crew. Furthermore, data entry, verification, screen editing and system development followed sequentially to enable the preparation of draft maps.

Data analysis package.

The mapping team analysed acquired data using MS Word and MS Excel for Windows, and spatial data using ArcGIS 10 software and mobile GIS applications. They performed rapid and systematic GIS overlays to generate base maps and risk and vulnerability maps.

Descriptive statistics.

The mapping team investigated trends per given indicator using tables, graphs, charts and frequencies. As processing of data developed, they merged it for cross tabulation and eventual production of thematic maps for the various types of hazards.

Generation and appraisal of draft Maps:

Prioritization set by the districts determined the various hazards presented on the thematic maps. The team convened a field workshop to present, appraise and validate the risk and vulnerability maps with respect to their accuracy and completeness. Information gaps were identified and filled in the final risk and vulnerability maps.

Phase IV: Refinement, validation and reporting

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

Overview of the District

Adjumani District is located in the North western region of Uganda, between altitudes 31°24" and 32°4" east of Greenwich line; and longitudes 2°53" and 3°37" north of the Equator. The District lies on the Eastern bank of the Albert Nile, which is its common border with Moyo District. It borders the districts of Amuru in the south and east, Arua and Yumbe in the West, and Moyo in the North. Adjumani is one of the Districts that form Uganda"s common border with the Republic of Sudan in the Northeast. The total land area of the District is 3128 Sq.Kms, of which 46.8 Sq.Kms is covered by water. The area occupied by forest is estimated at 37.44 sq kms. Out of the 1455 Sq.Kms of arable land, only 120.8 Sq.Kms is under cultivation.

Adjumani was pronounced a District on 17 July 1997. It was originally one of the three Counties in Moyo District known as East Moyo. One of the guiding principles in reviewing of the DDP was the District"s commitment to advance and strengthen the process of devolution right to the grassroots, Civil Society Organizations (CSOs) and the Private Sector in the development management. Deliberate effort was taken to involve the local leaders at all levels of local government, representatives of the CSOs and private sector in the planning process. This plan was evolved from a process that involved all stakeholders: the community, technical staff, donors, NGOs and policy makers. The District development plan has been made through wide consultations right from the village level taking into consideration various aspirations of different interest groups, including those from lower Local Councils, civil society organizations, the District Local Government and Central Government.

This plan is a result of a long process, which started with development of Village action plans for the entire District. Before making the parish plans the communities under the guidance of the Parish Development Committees identified their problem s (needs) using PRA tools. Then the DTPC compiled background data and situational analyses of all sectors / departments in which they incorporated relevant submissions from lower councils and NGOs. Then proposals from each sector were discussed and presented to the DEC where they were appraised and approved into a draft plan from 24th to 27th April, 2011

Demographic Data

Total population 354,500 Total male population 179,000 Total female population 175,500 Under 1 Year (4%) 14,180 Under 5 Year (18%) 63,810 6-12 years (22%) 77,990 Under 15 Year (49%) 173,705 Under 18 Year (58%) 205,610 10-14 years (15%) 53,175 15-24 years (22%) 77,990 All Adults (>18 years) (42%) 148,890 Youth (18-30 Years) (23%) 81,535 Elderly (60+ Years) (3%) 10,635

Technical Services

Total kilometres of feeder roads 660 Total kilometres of trunk road 46 Total kilometres of urban road 26

Water

Total number of deep wells 559 Total number of functional water points 505 Total number of non-functional water points 56 Total number of protected springs 18 Total number of shallow wells 61 Total number of water kiosks 60

Education

Total number of primary schools 70 Total number of Government-aided Primary Schools 67 Total number of private/NGO primary schools 03 Total enrolment in primary school 31,256 Total number of teachers in Primary School 999 Total number of untrained teachers in primary school 355 Total number of trained teachers in Primary Schools 513 Total number of permanent classrooms 766 Greatest travel distance to Primary School (kms) 5 Total number of Secondary Schools 15 Total number of Government-aided Secondary Schools 7 Total number of private/NGO Secondary Schools 10 Total number of Tertiary Institutions 0

Health

Number of health units 36 Number of government health units 33 Number of NGO health units (PNFP) 03 Number of District hospitals 1 Number of doctors 4 HC II Functional 21 HC II Non-Functional 3 Abandoned HC II1 Number of Health Workers 3,673

Administrative arrangement

Adjumani District has one County, East Moyo whose boundary is the same as that of the District. The District is comprised of nine Sub-counties and one Town Council, a Town Board of Pakele and proposed Town boards of Ciforo pending the approval of Minister of Local Government. These include: Adropi, Pachara, Ciforo, ukusijoni, Dzaipi, Arinyapi, Ofua, Itirikwa, Pakele subcounties and Adjumani Town Council. There are 53 Parishes and 202 villages.

Subcounties , Parishes and the No of Villages

Table: 1 Administrative Units

Sub county	Parishes	No of Villages
Adropi	Lajopi, Esia, Openzinzi, Palemo, Obilokongo	21
Pachara	Jihwa, Marindi, Omi,Unna, Alere	19
Adjumani Town Council	Central, Biyaya, Cesia	18
Ciforo	Loa, Mugi, Okangali, Opejo, Agojo	24
Ukusijoni	Kiraba, Gulinya, Maaji, Ayiri, Payeru	17
Dzaipi	Adidi, Mgbere, Ajugopi Logoangwa Angwarapi, Miniki	22
Arinyapi	Liri, Elegu, Zinyini, Ituji, Arasi	21
Ofua	Subbe, Tianyu, Bacere, OPi, iIlinyi, Ofua central	18
Itirikwa	Odu, Zoka Itirikwa, Mungula, Baratuku, Kolididi	18
Pakele	Pereci, Pakele Town Board, Meliaderi, Boroli, Fuda, Lewa, Melijo, Ibibiaworo, Nyivura	28

Political Structure

In line with the Local Government Act 1997 (Section 4), Adjumani has a district council, 5 Sub-county Councils and 1 Town Council. The District Council has an Executive Committee of 5 members including the chairperson. The role of the District Executive Committee is inter alia, to initiate and formulate policies for approval by council and oversee implementation of government and council policies. Members of the executive committee are designated as Secretaries. There are 2 standing committees i.e. finance, and general purpose. There are 4 statutory boards and commissions i.e. District Service Commission (DSC), Contracts committee (CC), District Land Board (DLB) and Public Accounts Committee (PAC
The standing committees are responsible for monitoring and reviewing the performance of their respective sectors and report to Council.

Administrative Structure

The Chief Administrative Officer heads the District Civil Service. A Deputy Chief Administrative Officer, Heads of Departments and other staff at both the District and Sub-counties assist him. The District is administered along eight directorates that fall under the sect oral committees. The directorates include; Management Support Services, Finance and Planning, Production and Marketing, Technical Services and Works, Education and Sports, Health , Natural resources and Environment, Gender and Community, and Statutory Bodies (Council, Committees and Boards).

Administrative Infrastructure
The District Administration has 100 acres of land in Adjumani Town council on which the district headquarters are established. Presently there are five blocks housing the Nine sectors of management support services & finance, planning, Water, Production Unit and health. One office block for the Finance & Audit is under construction. There are two prisons in the District: a Central Government and Local Government Prison. Most departments have vehicles and motorcycles for the staff. However, there is need to acquire more to ease on the transport problem of key and support staff at the district and Sub-county level. There is improved communication and information flow among the staff at all levels due to a radio communication system installed at the District and Sub-county headquarters. This improvement was even boosted further by the introduction of mobile phone services in the entire district by the three national operators; Airtel Uganda, UTL, Orange and MTN Uganda

Socio-economic situation

Uganda achieved strong economic growth and macroeconomic stability in the 1980s largely the result of an ambitious programme of macroeconomic adjustment and structural reforms. Overall, the economy expanded at 8.4% per annum on average since 2006. The economic growth was 7.2% in 2008/2009 and 5.8% in 2009/2010, however in 2010/2011 the economy is expected to grow by 6.4%. The strong growth helped to reduce the proportion of Ugandans living in absolute poverty from 56% in 1992 to 35% in 2000 but a slight rise to 38% in 2004. Despite the reduction in the headcount poverty, Uganda remains one of the poorest in the world. For example, in the Northern Uganda the proportion of the economy's working age population that are economically active is 67% according to Northern Uganda Baseline Survey 2004. The occupational distribution of the workforce shows that agriculture and fisheries workers dominate both in the Urban and rural areas, followed by service and sales workers and elementary occupations.

Agriculture

According to PEAP (2005), Over 90% of the population are involved in crop production, with over 90% practicing subsistence agriculture while below 10% practice commercial and semi-commercial agriculture. The main food crops grown are Cassava, sweet potatoes, sorghum, simsim and soya beans while cotton, simsim, maize, groundnuts and soya beans are the main cash crops. The cultivation methods are traditional and highly dependent on natural rainfall. Access to improved high yielding seeds, Animal traction and post-harvest handling to avoid losses and fertilizers in the District is practiced under small holder agricultural project. The poor performance of food sub sector has resulted into continued problems of malnutrition and pockets of famine and hunger I the District. The prevailing levels of childhood under and mal-nutrition are high, accounting for 40 per cent of all deaths of children before the age of five.

Livestock

Livestock keeping (cattle, goats, sheep, pigs and poultry) is the second most important economic activity with low yields due to wide spread pest, diseases, poor pasture, and lack of safe-drinking water sources for animals. The most common animal diseases in the district are tick borne, foot and mouth, rinderpest and intestinal and liver flukes. On average, a sizeable number of households keep between 2-3 animals. Other people depend on sale of local building materials, firewood, charcoal, mat making, brewing, petty trade and casual labour. Estimated income from sale of farm produce cannot be predicted, as people do not keep records. Majority of the population spend their income on payment of school fees, and purchase of more domestic animals, consumables (daily household needs) medical care and leisure.

Fisheries

Fishing is the third important economic activities in the District with 5% of the population depend on it for their livelihood. The main type of fish catch is Tilapia, Nile patch and Claris. Subsistence fish farming are used like Korokota and under sized nets. Transportation is still done on bicycles which limit the marketing of fresh fish.

Forest

The district is well endowed with natural forest, but it is under exploited. 1.5 % is covered with forest plantation. Zoka forest is the main biologically diverse forest. There is an accelerated rate of deforestation mainly due to encroachment on protected areas such as central forest reserves, conversion of forests into crop and grazing land, charcoal burning and over-harvesting of forest resources, high population growth, ineffective law enforcement sometimes due to political interference and de-gazetting of protected areas. This has direct negative impact on the livelihoods of the poor in relation to declining firewood sources, rainfall regime, soil erosion control and related environmental services.

Energy

Approximately 0.03%, 0.07% and 99.9% of the total population uses Electricity/gas, paraffin and other energy sources respectively. However, the main sources of energy for lighting are paraffin (41.4%) and firewood (24.9%). Electricity supply in the district is thermal and only available from 7 p.m. to 12p.m. An increasing number of households, local government offices and NGOs use solar panels to power electrical appliances although high initial costs have kept away potential users. Lack of efficient energy sources such as hydroelectricity is an obstacle to small and medium industrialization in the district.

Industry

Industrialization is generally low in the district and dominated by cottage industry preoccupying 0.42% of the population. Other activities include: carpentry woodwork (5.7%), metal products (3.2%), leather manufacturing (4.6%), mechanical repairs (3.3%), brick laying (6.5%), food & cash 14 crop processing (58.3%), and embroidery and other crafts (17.98%). Women who are able to obtain the majority of raw materials locally mainly do embroidery and crafts.

Construction

Houses are constructed using mud or wattle with grass thatches. Corrugated iron roofs are mostly found in Adjumani Town Council and a few other trading centres. Sanitation and water coverage above 60%.Communities near rivers and wetlands fetch and drink water from unsafe sources such as streams, rivers, ponds and swamps. The road network is sparse and not tarmac. However, Education, healthcare and other social services are adequate and easy to access in the rural areas.

Trade

It is estimated that about 1.2% of the districts population earn their living through commerce. Small retail trade is the common commercial activity in the district. Items sold include a range of locally manufactured and imported goods. A significant section of the district's trade is in agricultural produce. Cross-border trade is lucrative along the Sudan border. The District administration generates low local revenue relative to its responsibilities and activities due to the high level of poverty among households. The major source of local revenue is market dues tender fees which constitutes over 50% of total revenue. The Central Government provides funds to meet development and recurrent costs and in many cases earmarks funds as conditional grants to the district. The decentralisation process has, however, provided an enabling environment for community based development and some supplement from the donor and NGO support to the district.

Game reserves and tourism

Wetlands Resources
Wetlands cover 46.8sq.km of the total area of the District (1.5%). The largest wetland in the District is along the Nile. The District has seasonal and permanent wetland. The seasonal wetlands are found in most parts of the District while the permanent ones exist along the Nile and the Southern parts of the District and along rivers Zoka, Esia, Itirikwa and Tete. Traditionally in the District wetlands have been used as source of materials for crafts, hunting area and fishing areas. Seasonal wetlands and margins of permanent wetlands have been used for grazing livestock, growing of crops and source of domestic water.

Fresh Water Resources
The fresh water resources in the District are found on the Rivers Nile, Zoka, and Esia, Itirikwa and Tete and seasonal streams. Fresh water resources in the district are mainly used for fishing, transport small-scale irrigation and harvesting of materials for craft making. Some communities use the water for domestic purposes and watering of livestock. The important resources in the fresh water resources in the district include fish, water for production and safe water supply, tourist scenes/sites and supply of raw materials for several purpose(e.g. papyrus). The main fish types in the fresh waters of Adjumani include Tilapia, Disttichodus, Niloticus, Mormyrus, Clarias, Protopterus,Bagrus, Synodontis, Lates Niloticus, Labeo, Alestes, Citharinus Citharus, Malapterurus. electricus, Schilbe Mytus, Polypterus Senegalus

Ecosystems diversity
The Landscapes include the Albert Nile stretch, the escarpment and hills above the Nile"s eastern side, and the rolling country side of southern Adjumani District. Vegetation is diverse comprising of medium altitude moist deciduous forest in the Zoka forest,forest savanna mosaic, Butyrospermum and Combretum savannas, and wetlands. The banks of the Nile are fringed by Khaya forest, and there are extensive areas of Papyrus along the Nile. Seasonal wetlands and a few permanent wetlands are found in the District. The wildlife population in the District including Sitatunga, elephants, buffaloes, kobs, giraffes, waterbucks, hartebeest **Opportunities** Zoka forest is under the management of the National Forestry Authority. Management plans for this area has started to be implemented. East Madi Wildlife Reserve (834sq km) and the Nile have high potential for Tourism development and hence of

conservation importance. Uganda Wildlife Authority is already active in the management of this Reserve.

Forest and Woodlands

Forests and woodlands are important resources and play multiple ecological, economic, social and cultural roles in Uganda. The forest cover in Adjumani is poor. The Central forests reserves in the District are covered with tropical high forests, woodlands, grasslands some bush lands and wetlands and impediments. The Local forest reserves in the District are mainly eucalyptus plantations and have been highly encroached by subsistence farming. The Private woodlots established by UNCHR/OPM (860 acres) and smaller ones by individuals/institutions. Forestry is under exploited in a district well-endowed with natural forest and 1.5 % forest plantation. Adjumani is rich in biologically diverse forests such as Zoka. The main exploitation of the forests is in the form of wood harvesting, which provides firewood to the majority of the district's population, with 99.7% using fuel wood for cooking.

Livelihoods

Table 2: Adjumani District Livelihoods, By Sub-County

Nile Belt (Dry Belt)	Fishing Crop Farming (Maize, Sorghum, Simsim, Cassava, Rice, Groundnuts, millet) Livestock Rearing (Cattle, Sheep, Goats, Pigs and poultry) Trading/ Small scale businesses Hospitality services (Araa Fishing Lodge, Nile Crocodile Park) Hired Labour Brewing local Gin Brick laying Stone Quarrying Bee Keeping/ Apiary	Pachara Dzaipi Ciforo Ukusijoni Arinyapi
Middle Flat Land /Plateau (Moderately Wet)	Crop Farming (Maize, Sorghum, Simsim, Cassava, Rice, Groundnuts, millet) Livestock Rearing (Cattle, Sheep, Goats, Pigs and poultry) Business/ Commercial Service (ICT, Private Schools, Private Health Centres, Rentals) Trading/ Small scale businesses Hospitality services (Lodges, Restaurant, Hotels, eating places) Hired Labour Brewing local Gin Brick laying Stone Quarrying Bee Keeping/ Apiary	Adjumani Town Council Adropi Pachara Itirikwa Dzaipi Pakele Ciforo Arinyapi Ofua

Forested & Woody (Wet Belt)	Lumbering Wildlife Conservation Crop Farming (Maize, Sorghum, Simsim, Cassava, Rice, Groundnuts, millet) Livestock Rearing (Cattle, Sheep, Goats, Pigs and poultry) Business/ Commercial Service (ICT, Private Schools, Private Health Centres) Trading/ Small scale businesses Hospitality services (Lodges, Restaurant, Hotels, eating places) Hired Labour Brewing local Gin	Itirikwa Pakele Ukusijoni Ofua

Women's Livelihoods

Analysis of Gender Issues of the 2002 census put Adjumani District women population at 51% (101,502) compared to the men who constituted 49% (99,991) out of the total population of the 201,493. To date, the population trend has slightly changed in favour of men.

The latest report by UBOS (2009) indicates that out of the total population of 331,600 people in the District, the men now are 166,900, constituting 50.33% while the women are 164,700, constituting 449.67% of the population. This is attributed mainly to the high maternal mortality rate during pregnancy and the poor health of women as a result of the heavy work load in the domestic spheres.

Besides the poor health status resulting into high mortality rate among women, statistics also indicate that their overall situation is not any better in all spheres of life. The poverty level is still relatively higher among women compared to that of men. Even the literacy levels among women are still high compared to that of the men. Access to and control over productive resources especially land and the decisions made on what to do with the land is mainly in the hands men.

A number of factors, mainly cultural in nature has denied women access to education or forced them to drop out of school. UBOS survey (2009) puts the illiteracy rate among women at 47% and that of men at 22%. This indicates that most women are generally illiterate compared to their counterpart the men. The rural women are worse off in this situation with their illiteracy standing at 49% compared to the urban ones at 33%. The traditional attitude that gives preference to boys" education than girls" education is responsible for this as the girls are expected to be married off at an early age. They are regarded as a source of wealth in form of bride wealth and therefore denied access to education. This partly explains the gender imbalances in the enrolment of both the boy and girl children both at higher primary and secondary level. To date, the Primary School enrolment of boys compared to girls" stands at 16,372 boys (52%) compared to 14,915 girls (48%) in 2009.

In the political arena, only directly elected women as a result of affirmative action (1/3) are the ones that represent the women at all levels including the District Council. Very few women (if any) compete with men for the open representations which are not as a result of affirmative action. In the entire district, there is virtually no woman in LCI, LCII or even LCIII chairpersons. They are in most cases given the consolation positions of vice chairpersons, which in essence, the incumbent is supposed to be the secretary in charge of children affairs – a position usually associated with women because children issues are regarded as women affairs. Here again, they still ride on the 1/3 representation of women in the executive. This is a clear demonstration of the negative attitude men have towards women in leadership positions and the fear most women have in taking leadership positions at all levels.

Among the appointed staff, women are most prominent in the low cadre jobs as office attendants and messengers. The senior management positions are dominated by men who constitute about 84%. Of the 30 heads of Departments in the District, there are only 5 women Heads of Departments noted in Management, Health, Education, Lands and Human

resources. Even then, some are not in full capacities but acting, with high chances of their replacements being men. The rest of the other departments are all occupied by men at senior levels with women as their juniors. In the Sub-counties, the situation is fair. Of the 5 sub counties in the district, 3 of them are women. Only 2 are men. Even the CDOs and Accounts staffs are fairly balanced

Ethnicity

The census 2002 shows national population represents a number of ethnic and tribal groups with Madi being the single largest group comprising 90 %, followed by the Lugbara of 4.3% as shown in table 3 below. The Southern Sudan tribal groups (Madi, Kuku, Dinkas, Acholi Bor, Zande) make up about 95 % of the refugee population, which is 25.1% of the district population. Ethnic groups are organized around the Institution of the Patrilineal clan in which clans are made of several lineages that divide themselves into families and households. The households are composed of a nuclear-type family. The relationship between the ethnic groups is jovial.

Ethnicity of the District

Table 3 Ethnicity of the district

Sub county	Tribe	Language Spoken
ADROPI	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara,	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
ADJUMANI TC	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara,	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
ARINYAPI	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
CIFORO	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
DZAIPI	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
OFUA	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
ITIRIKWA	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
PACHARA	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
PAKELE	Madi, Acholi, Dinka, Nuer, Aringa, Gimara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili,
UKUSIJONI	Madi, Acholi, Dinka, Nuer, Kuku, Lugbara	Madi, Luo,Dinka, Kuku, Lugbara, English, Kiswahili

Hazards

Table 4: Hazard Status

Hazard category	Status	Sub County	Rank
HUMAN DISEASE/ EPIDERMICS	Instances of diseases like Hepatitis B, Malaria, Meningitis , HIV/AIDS, onchosiasis are reported regularly to health facilities which are caused by Poor Hygiene, Mosquitoes, Poverty, Old age, poor feeding habits, illiteracy, poor health seeking behaviour resulting into death	All the Sub counties	4
CROP DISEASES	Crop pest is the major cause of losses in both pre and post harvest season of the year. The major crop diseases are cassava mosaic, Banana wilt, Bean Rush which have been reported to the District Agricultural Department	All the Sub counties	7
ANIMAL DISEASES	Cases of tick borne Diseases, African Swine Fever, Nagana, foot and Mouth Disease, foul pox, rabbies are reported to the District Veterinary Department which are caused by	Itirikwa, Ofua, Ciforo, Ukusijoni, Adropi, Pachara, Dzaipi, Pakele,Arinyapi	6
PROLONGED DROUGHT/FOOD INSECURITY	Instances are common in the Months of December – April characterised by inadequate water supply and pasture for Animals, hunger, domestic violence, frequent occurrence of meningitis cases,	In all the Sub counties	6
BUSH BURNING	Instances of Bush burning commonly are commonly reported to the sub counties, the LC I and the Production Department especially during the dry season in the months of December – April every year. It is caused by Search for new pasture, edible rats, crime tendencies, primitive lifestyle of the people to set bush fire during dry season, pride, and opening agricultural land. This environment is characterised by wild bush fire which causes destruction of properties e.g. Farmland, Buildings, animals etc	In all the Sub counties	1

Hazard category	Status	Sub County	Rank
FLOODS	Instances of flooding are reported in the months of the rainy season that runs from April – November yearly. This period is characterised by soil saturation, soil erosion, destruction of vegetation and infrastructure, pest infestation especially mosquitoes, spread of diseases like cholera, dysentery, malaria which are routinely reported to the Sub county Authorities, Health Centres and the District Administration in general. The major causes of flood are climatic change and environmental degradation	Ciforo, Ukusijoni, Dzaipi, Arinyapi, Pachara	5
SUICIDE	Instances of Suicidal cases are reported to Police. The Police report indicates that atleast 3 Suicidal cases happen in a month this has send a shock wave to the local Authorities and the Communities. It is Mainly caused by high level of Poverty, mental disorders, inadequate counselling services, domestic violence, alcoholism and drug abuse resulting into Population decrease, trauma, social misfit, loss of family labour and income	In all the Sub counties	8
HAILSTORMS & LIGHTNING	Instances of Hailstorm and Lightning are common in the District during the rainy season in the months of April – November yearly. The major causes are Climatic change, environmental degradation resulting into loss of human and animal lives, destruction of properties, infrastructure, farmland and famine /food insecurity	Pakele, Dzaipi, Adjumani Town Council	9
STRONG WINDS	Cases of strong wind are registered in the District during the dry Season. This incidences are caused by Climatic change, environmental degradation e.g deforestation, overgrazing, bush burning, lowland terrain, desertification resulting into loss of property, destruction of crops, and famine /food insecurity	In all the Sub counties	8

Hazard category	Status	Sub County	Rank
REFUGEE INFLUX	Refugee influx into the District is at alarming stage especially from the Month of December2013 to date, leave alone the fact the refugee existed in this District from 1986 where some were voluntarily repatriated back to Sudan in 2005 while others remained in Adjumani District which has worsened the current refugee situation, so far over 90,000 refugee have been registered in the District. The refugee influx into the District is caused by Civil and tribal war in South Sudan resulting into Pressure on social services, outbreak of epidemics, food insecurity, social insecurity, increase in commodity prices and land conflict	Pakele, Dzaipi, Arinyapi,Pachara, Ukusijoni, Itirikwa	3
ENVIRONMENTAL DEGRADATION	Instances of environmental degradation are registered in the District throughout the year. The worst instance occurs in the refugee settlement areas. The major causes of environmental degradation are Poor farming practices, bush burning, heavy rains, drought, cutting of trees, charcoal burning, constructions , brick laying, quarrying resulting into poverty, famine, insecurity, population migrations, high cost of living, Human and animal death	Mainly Dzaipi,Pakele, Pachara , Itirikwa Adjumani Town Council, Arinyapi and Ukusijoni	1
LAND CONFLICTS	Instances of Land Conflict witnessed by bloody clashes, reported to local Authorities and courts of law. The worst situation has been registered between Adjumani and Amuru District Boarders. The major causes are Political interests, uncompleted boarder demarcations, economic hardships, high population, poverty resulting into death, destruction of property, insecurity, tribal, clan and family conflicts	All the Sub counties	2

Hazard category	Status	Sub County	Rank
INVASIVE SPECIES OF WEEDS	The invasive species of weeds that found in the waters of the Nile and land surface. There are presence of Water Hycinth in the Nile in the Subcounties of Pachara, Dzaipi, Ukusijoni, Ciforo and dangerous species of weeds on the arable land which negatively impacts on crops and animal growth. This is due climatic change resulting into reduction in the number aqua species and land fertility	All	10
WILD ANIMALS	There are cases of wild Animal attacks like Elephants, Hippopotamus, crocodiles, monkeys, baboons, wild pig that destroy crops during flowering and harvesting seasons. This is caused by human encroachment into their habitat resulting into community conflict with Uganda Wild Life Authority and the Government	Arinyapi, Dzaipi, Pakele, Itirikwa, Ukusujoni, Pachara, Ciforo	7

Summary of hazards by sub-county

Table 5: Summary of hazards by sub-county

HAZARD SUMMARY															
SUB COUNTY	HUMAN DISEASE/EPIDERMICS	CROP DISEASES	ANIMAL DISEASES	PROLONGED DRY SPELL/FOOD	BUSH BURNING	FLOODS	SUICIDE	HAILSTORMS & LIGHTENING	STRONG WINDS	REFUGEES INFLUX	ENVIRONMENTAL DEGRADATION	LAND CONFLICTS	INVASSIVE SPECIES OF WEEDS	WILD ANIMALS	TOTAL
ADROPI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
ADJUMANI TC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			12
ARINYAPI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
CIFORO	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	13
DZAIPI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
OFUA	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	13
ITIRIKWA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
PACHARA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
PAKELE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
UKUSIJONI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
TOTAL	10	10	10	10	10	10	10	10	10	8	10	10	9	9	136

Hazard Risk Assessment

Table 6: Hazard risk assessment

Hazard Category	Sub County									
	Adropi	Adjumani Tc	Arinyapi	Ciforo	Dzaipi	Ofua	Itirikwa	Pachara	Pakele	Ukusijoni
Human Disease/ Epidemics	H	H	M	M	H	M	H	M	H	M
Crop Diseases	L	L	L	L	L	L	L	L	L	L
Animal Diseases	L	L	M	M	M	M	H	M	M	H
Prolonged Drought/ Food Insecurity	M	M	M	M	M	M	M	M	M	M
Bush Burning	H	L	H	H	H	H	H	H	H	H
Floods	M	M	H	H	M	L	L	H	L	H
Suicide	M	M	L	L	L	M	M	M	M	M
Hailstorms & Lightning	L	L	L	L	L	L	L	L	L	L
Strong Winds	M	M	M	M	M	L	L	M	M	L
Refugees Influx	M	H	M	M	H	M	H	H	H	H
Environmental Degradation	H	H	H	M	H	M	H	H	H	H
Land Conflicts	M	H	H	H	H	H	H	M	H	M
Invasive Species Of Weeds	L	N	L	L	L	L	L	L	L	L
Wild Animals	L	N	H	L	H	M	H	L	M	M
Risk Score: H = High, M = Medium, L = Low, N = Not Reported										

Table 4 expresses the communities' assessment of severity and likelihood of risk in their respective Sub-counties. Each of the rows containing hazard categories in table translates into respective 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.
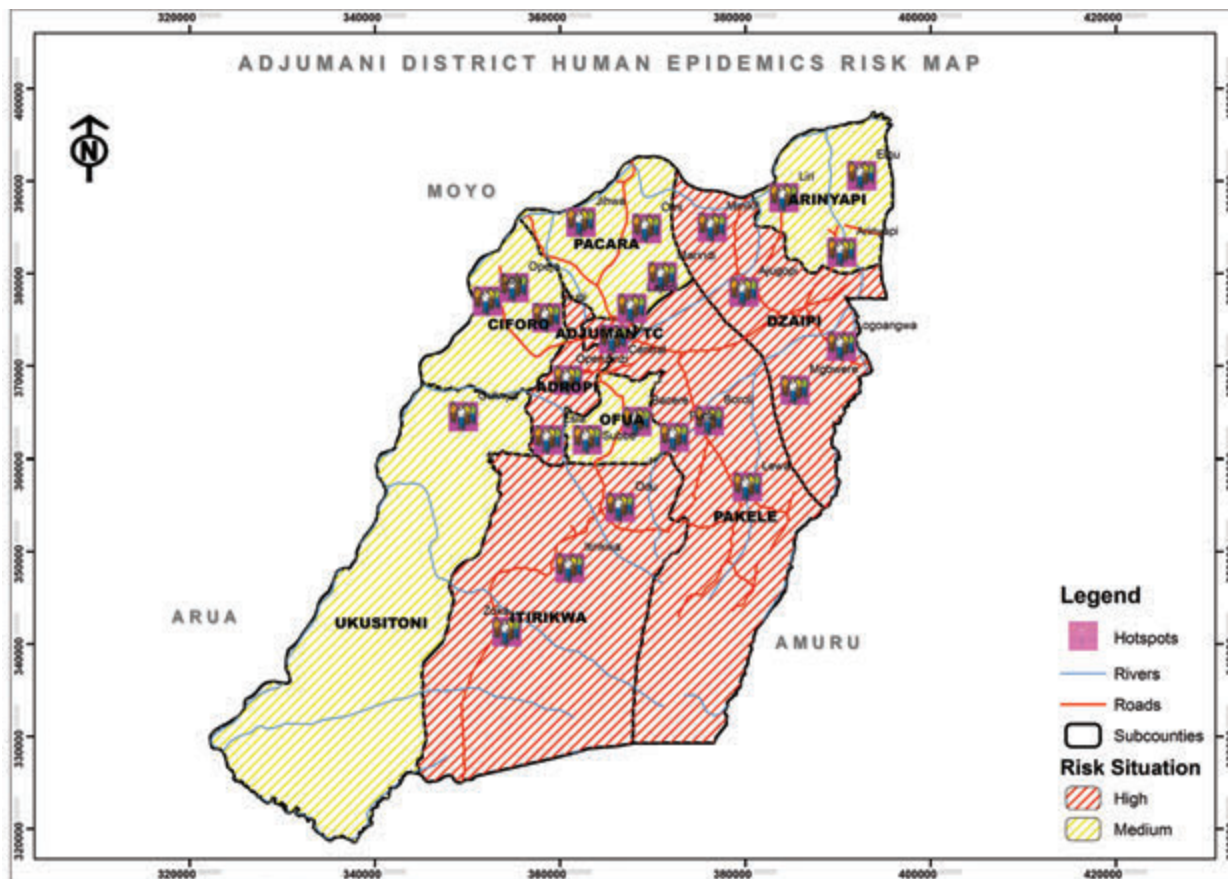
RISKS

Human Disease /Epidemics

Figure 1: Human epidemics Risk Map

Figure 1 above presents the risk status of human epidemics in Adjumani District. The hazard is widespread in the entire district to varying risk levels. The communities of Itirikua, Pakele, Dzaipi, and Adropi sub counties together with Adjumani Town Council are prone to high risk of human epidemics, while all the other sub counties are prone to moderate risk of the hazard.

The most common disease against which a massive vaccination has been carried out is hepatitis B and meningitis especially with the influx of the large numbers of the Refugees in the District. Crowding is common in populations displaced by natural disasters and can facilitate the transmission of communicable diseases such as *Neisseria meningitidis* meningitis transmitted from person to person.

Crop Disease
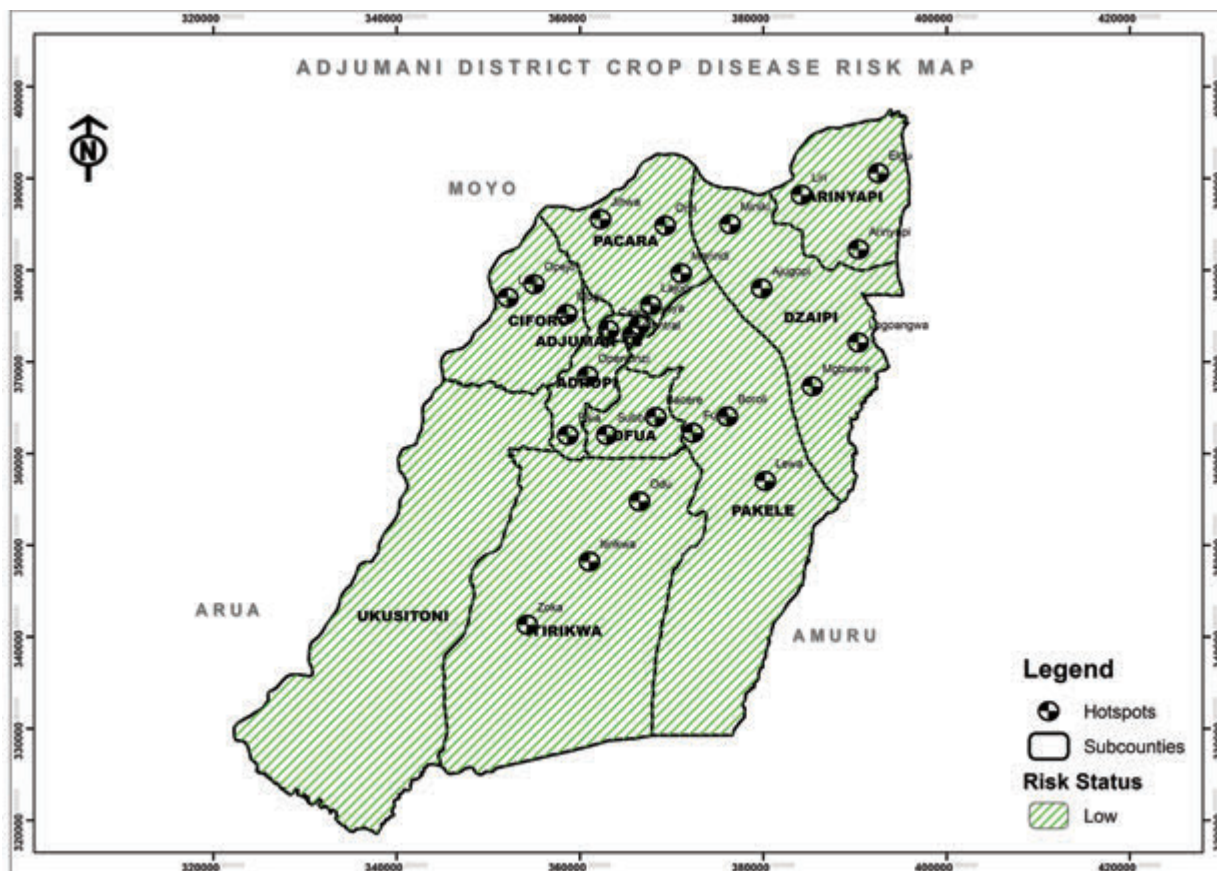
Figure 2: Crop Diseases Risk Map

Figure 2 presents the risk status of crop diseases in Adjumai District. The hazard is widespread in the district though the communities in all the sub counties and town council are prone to low risk to it.

The factors that are perceived to be responsible for the cause of the crop diseases are: Climatic change, introduction of new improved varieties, porous borders with the neighboring district and country, non-adherence to modern agricultural practices, inadequate inspection and enforcement of laws and regulations of agriculture.

The most common crop diseases in Adjumani District are Cassava Mosaic, cassava brown streak, banana bacterial wilt, beans rust. The hazard is experienced throughout the year but mainly during the rainy season in the months of April to November. The inevitable effects of crop pests and diseases are food insecurity, high crime rate, theft, susceptibility to diseases arising from malnutrition especially among children and domestic violence
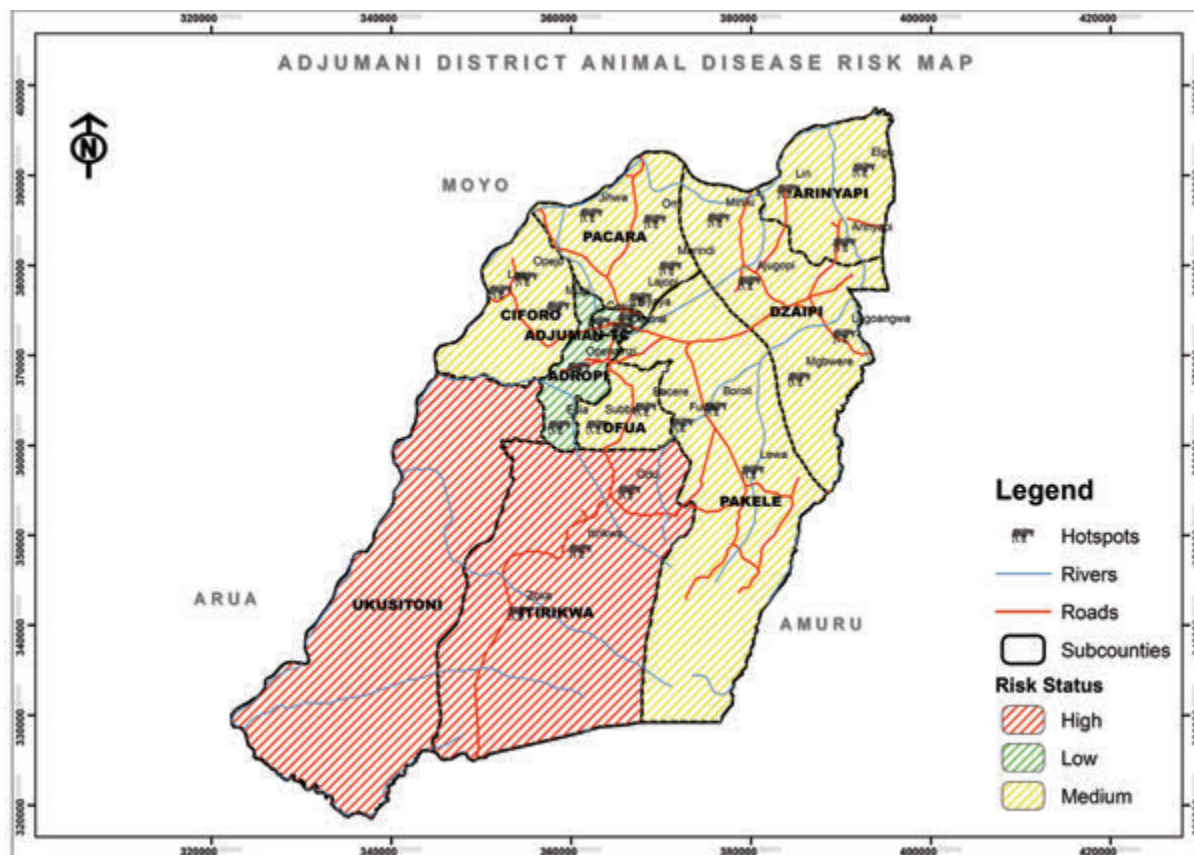
Animal Diseases

Figure 3: Animal Disease Risk Map

Figure 3 presents the animal disease risk status in Adjumani District. Much as animal diseases are rampant in the entire district, the communities of Ukusitoni and Itirikwa sub counties are prone to high risk of the hazard while those of Adropi Sub County are prone to low risk. The rest of the sub counties including the Adjumani Town Council are prone to moderate risk.

The most common Animal Diseases in the District from the period 2013/2014 has been foot and mouth Diseases; Foot and Mouth Disease (FMD), which was first confirmed in 1953 and since then several control measures have been applied; and African swine fever for which the District is currently quarantined. Other animals epizootic such as Nagana continue to threaten in the Sub counties bordering Zoka Belt, Congo Crimean Hemorrhagic Fever (CCHF), CBPP, Avian Flu, Trypanosomiasis are also reported to affect Goats, Cattle and sheep throughout the District. African animal trypanosomiasis occurs in many wild and domestic animals. Trypanosomes can infect all domesticated animals, but in many parts of Africa, cattle are the main species affected because of the feeding preferences of tsetse flies. In cattle, the disease is called Nagana, a Zulu word meaning "to be depressed."

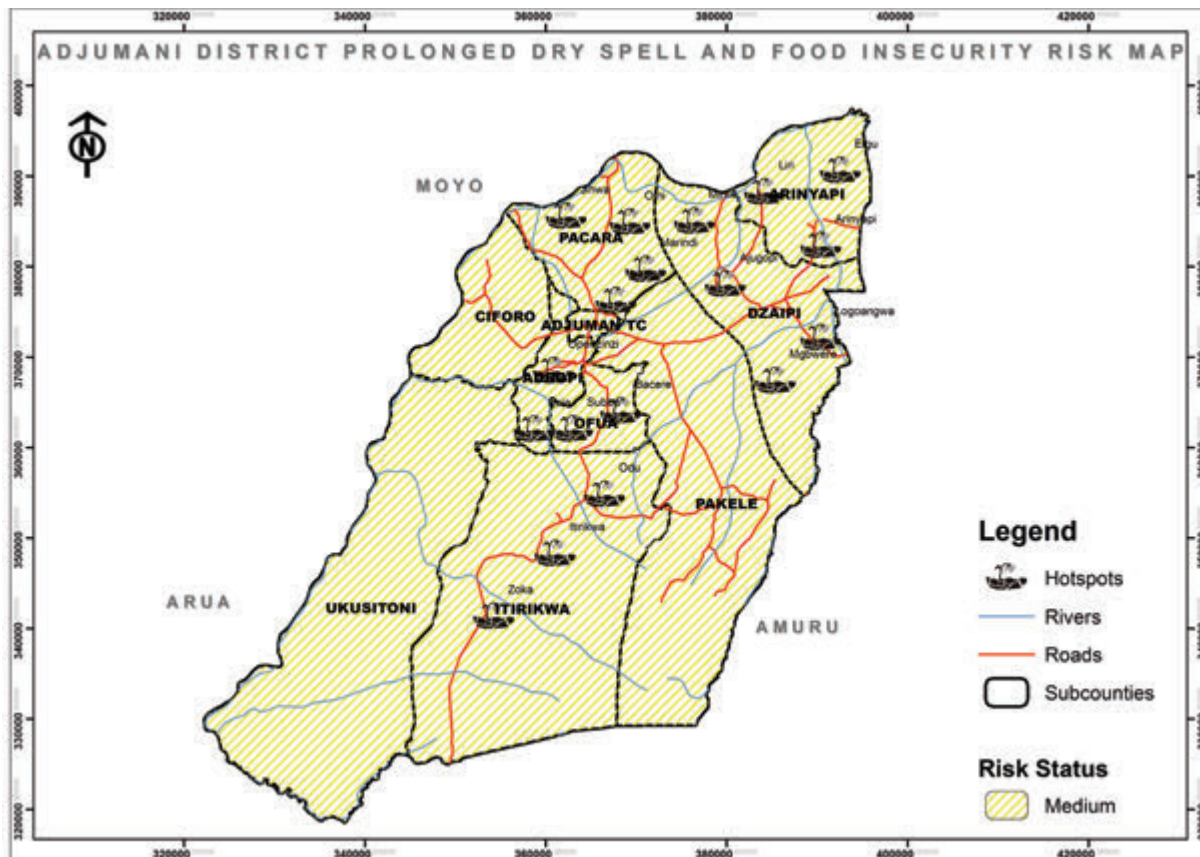**Prolonged Dry spell/Food Insecurity**

Figure 4: Prolonged Dry Spell Risk Map

Figure 4 presents the risk status of prolonged dry spell in Adjumani District. The phenomenon is widespread in all sub counties of the district including Adjumani Town Council. The communities are uniformly prone to moderate risk of prolonged dry spell. The perceived causes of the prolonged dry spells are climate Change, lumbering, charcoal burning, overgrazing, poor farming practices.

The changing weather patterns are making it difficult for farmers in the district to plan for farming seasons using the traditional knowledge about the two planting seasons a year. Prolonged dry spell is a common in the months of November – December and the March to April each year.

It results into low agricultural productivity, food insecurity, high crime rate, increased sexual gender based violence and low level of economic activities.
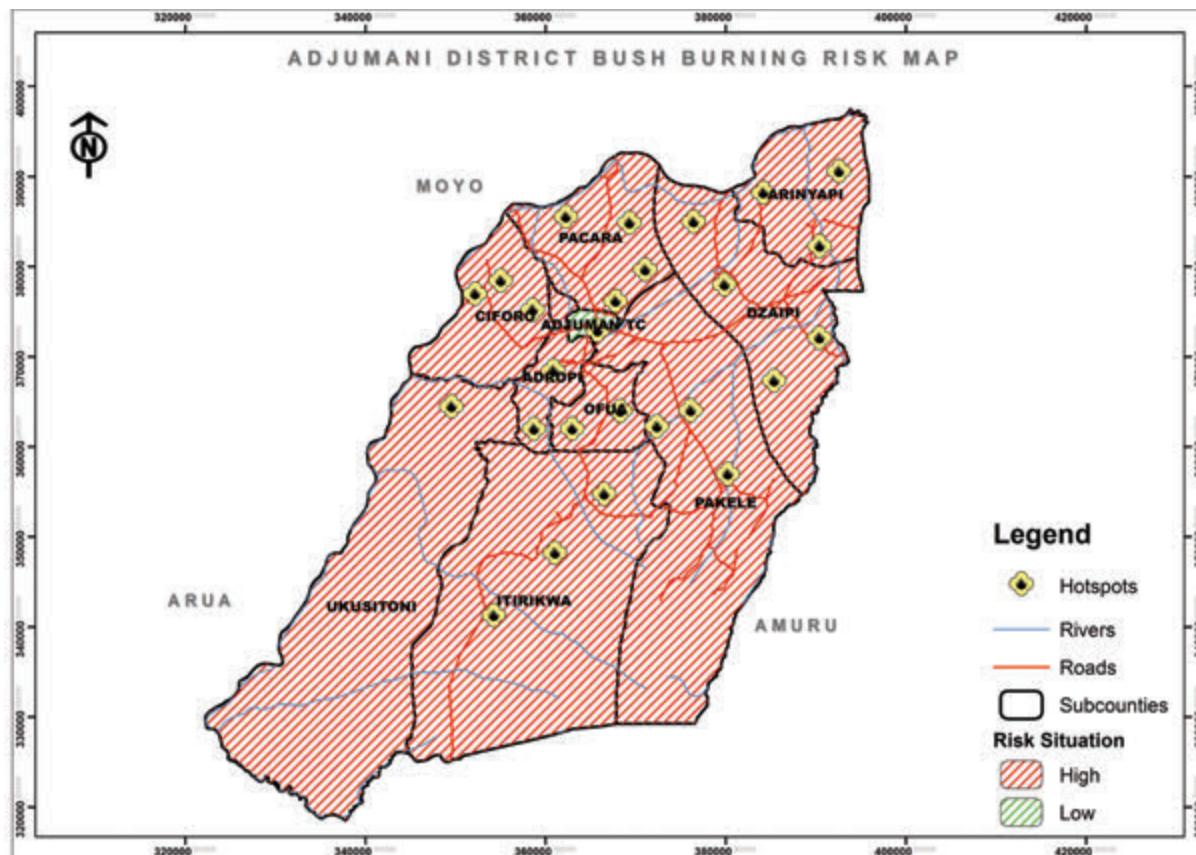
Bush Burning:

Figure 5: Bush Fire Risk Map

Figure 5 presents the risk status of bush burning in Adjumani District. Bush burning in Uganda is an old practice but not regulated. Many parts of the country especially the north go into flames because of bush burning during the dry seasons. It is a common practice by the communities of Adjumani District and the peak is in the months of December – March every year.

The communities in all the sub counties of Adjumani district are prone to high risk of bush fires except Adjumani Town Council which is prone to low risk of the hazard. Bush burning in northern Uganda is used as land management practice to clear land for cultivation, search for edible rats, new pasture for the animals and criminal tendencies by some community members to destroy other people's property.

This results into loss of property and environmental degradation. Bush burning produces smoke into the atmosphere and this is where it becomes dangerous to the environment and human health.
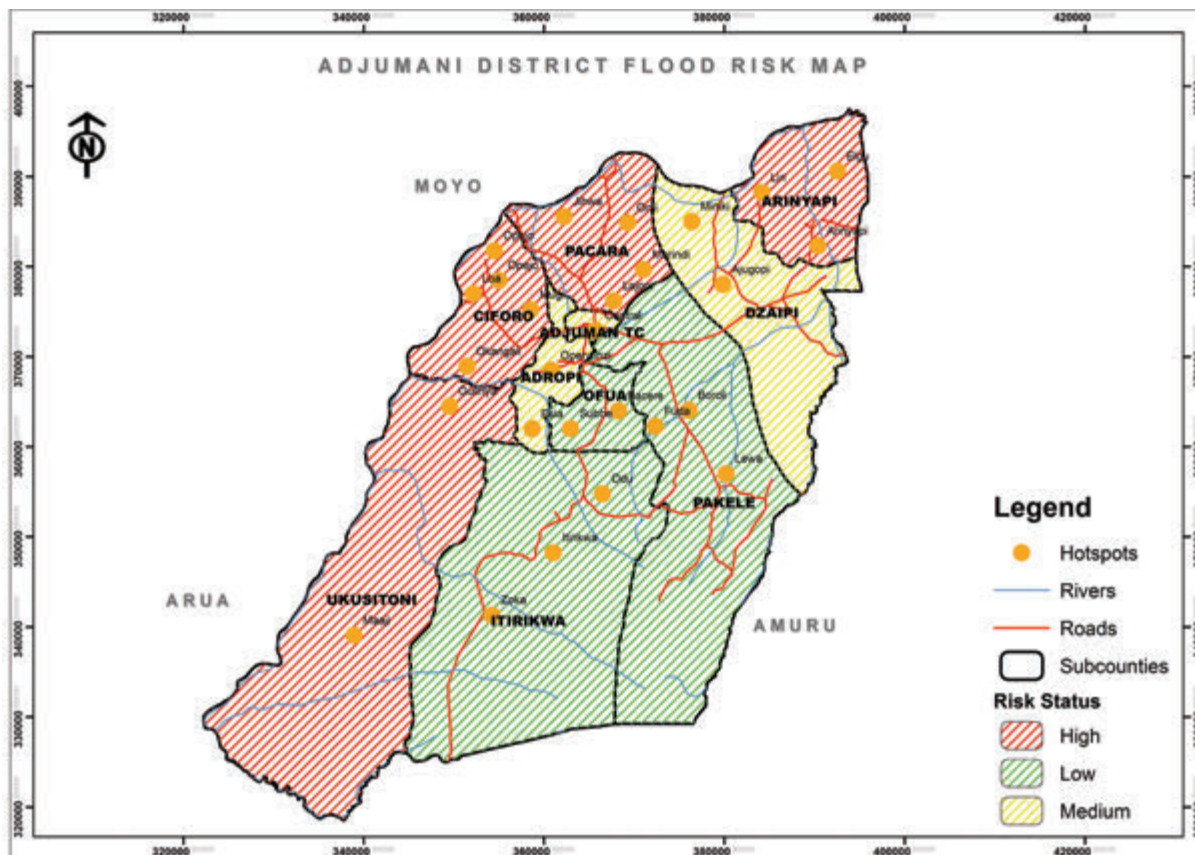
Floods

Figure 6: Flood Risk Map

Figure 6 depicts the flood risk status in Adjumani District. Flooding is already one of the most frequent and widespread of all environmental hazards. According to the International Federation of Red Cross and Red Crescent Societies, between 1993 and 2002, flood disasters "affected more people across the globe - 140 million per year on average - than all the other natural or technological disasters put together".

Floods are experienced in the district during rain seasons in the months of April-November every year. The communities of Arinyapi, Ciforo, Pachara and Ukusijoni Sub counties are prone to high risk of foods, while Adropi and Dzaipi sub counties are prone to moderate risk of floods. The rest of the district is prone to low ris of the hazard. The hot spots are along River Nile and the streams Tete in Arinyapi, Itirikwa in Ukusjoni, Esia in Ciforo and generally in the lower lying areas like Ogolo, Elegu, Pamajua, Nyumanzi, Arra , Ajujo, Ogujebe, opejo, Mugi, Magburu, Dubaju, Atura, Gulinya, Maaji, Esia.

In 2009, Over 50 families were displaced in Adjumani district as a result of flooding following incessant rains .The affected families were from three sub counties and the most affected areas included Arinyapi and Ogolo villages in Dzaipi Sub-county, Ogolo IDP camp in Pakele Sub-county, and Chinyanya village in Ciforo Sub-County. The floods also swept away several goats and destroyed several crop gardens.
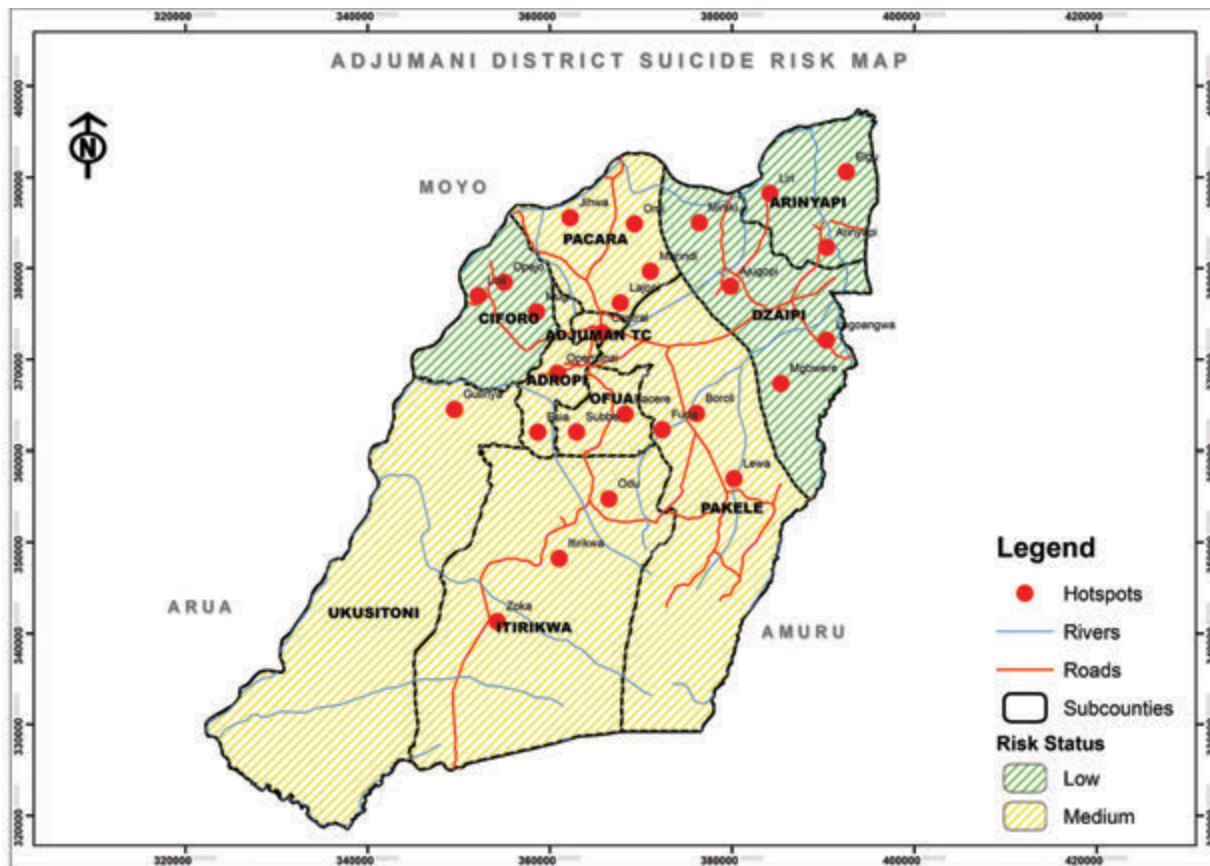
Suicide

Figure 7: Suicide Risk Map

Figure 7 presents the risk status of suicide in Adjumani District. The high prevalence of suicide in Adjumani District appears to be a symptom of psychosocial distress related to many years of social and political turmoil and the poor socio-economic conditions. The lack of psycho social support to the post conflict district and inadequacy of DRR in the district could be compounding factors. Suicide is common and most suicide is by hanging oneself.

The Police Report in the District reveals that at least 3 Suicide cases occur in the District each month. The communities of Adropi, Adjumani Town Council, Ofua, Itirikwa, Pachara, Pakele and Ukusijoni Sub counties are prone to moderate risk of suicide and those of Dzaipi, Arinyapi and Ciforo Sub counties are prone to low risk of the hazard.

It is believed that Adjumani District is one of the leading Districts with suicidal deaths in the country. Causes of the death are very unclear because the dead does not leave any document behind to explain cause but it's associated with poverty, alcoholism, drug abuse, effect of prolonged civil war, and domestic violence leading to death.

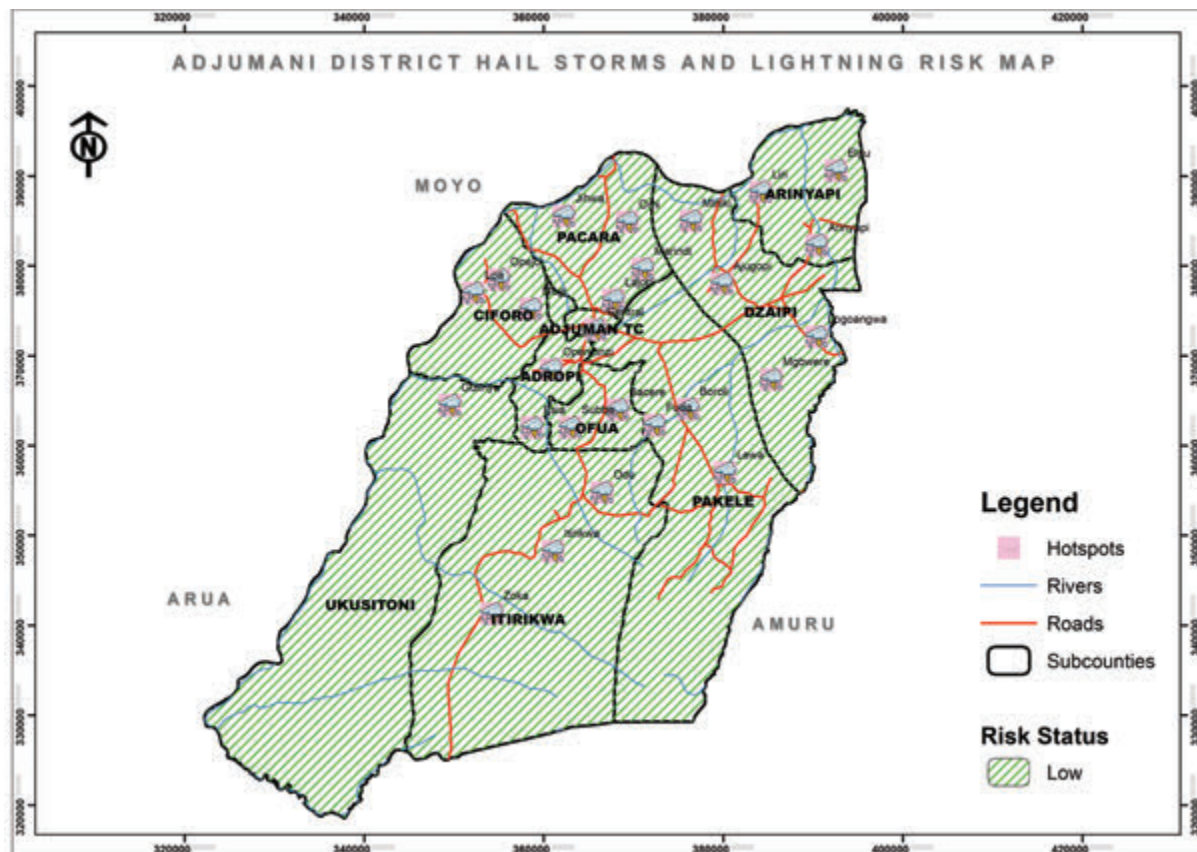**Hailstorm and Lightning**

Figure 8: Hail Storms and Lightning Risk Map

Figure 8 presents the risk status of hailstorm and lightning in Adjumani District. The hazard is widely spread in the district with communities prone to low risk. Thunderstorms, lightning and hailstorms are associated with towering thunder clouds. It mainly occurs during the rainy season in the Months of April – November yearly. Hail storms are not only disastrous to crops but also livestock and people. Loss of human and animal lives, property, infrastructure destruction of crop farmlands, famine /food insecurity are the resultant effects hailstorm and lightning

Strong Winds

Figure 9: Strong Winds Risk Map

Figure 9 presents the risk status of strong winds in Adjumani District. The communities of Ciforo, Itirikwa and Ukusijoni Sub counties are prone to low risk of strong winds, while all the other sub counties are prone to moderate risk of strong winds. This is mainly attributed to high vegetation cover in the 3 Sub counties of Ciforo, Itirikwa and Ukusijoni but the rest of the Sub counties have low vegetation cover to serve as wind breaks thus the strong winds wreak havoc to property.

The strong winds blow off roofs, topple trees, infrastructure like power lines and sweep farm lands. In a nutshell, strong winds result into destruction of property and sometimes leaves some people homeless.
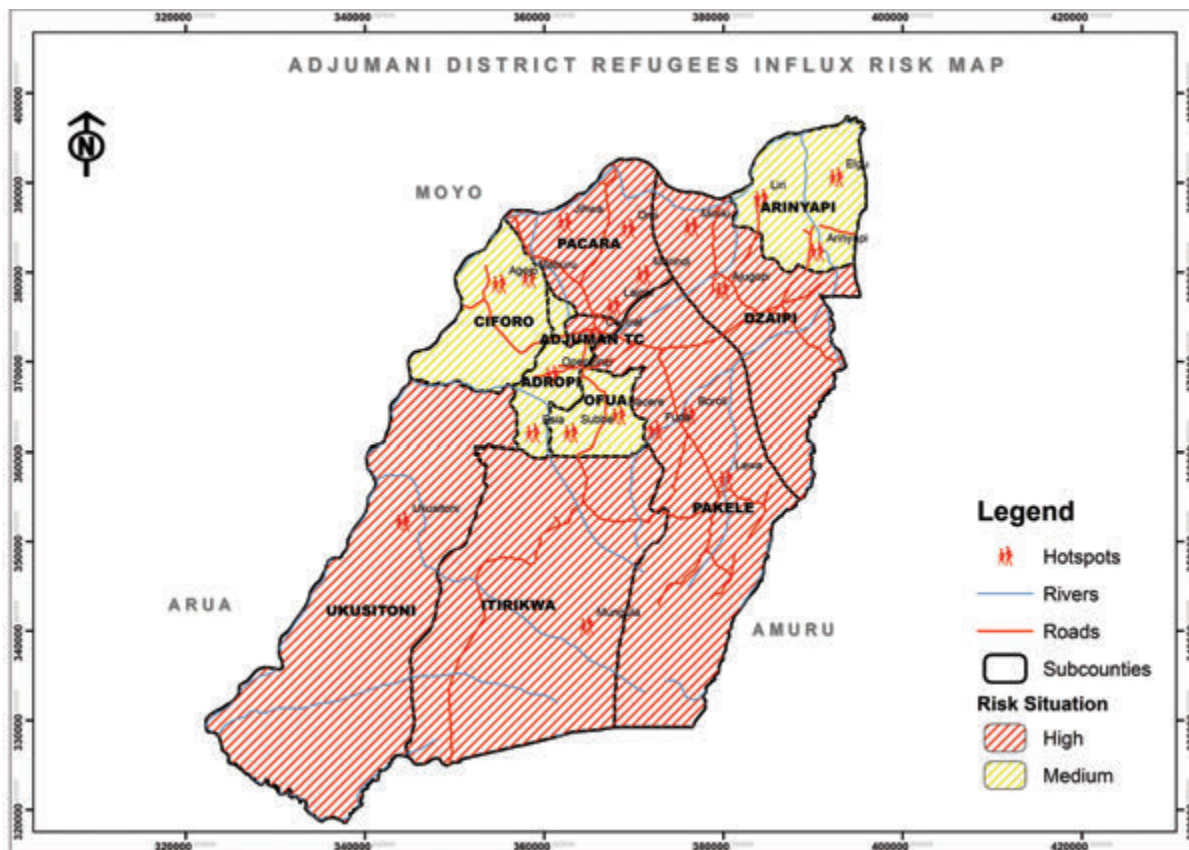
Refugee Influx:

Figure 10: Refugee Influx Risk Map

Figure 10 depicts the risk status of refugees in Adjumani District. This has been a major disaster in the District whereof most of the sub counties and the Town Council are prone to high risk except Ofua, Adropi, Ciforo and Arinyapi sub counties which are prone to moderate risk.

The most affected Sub counties are Dzaipi, Pakele, Pachara, Itirikwa, Ukusijoni and Adjumani Town Council. The main Refugee settlements/camps are, Nyumanzi I & 2, Baratuku, Elema, Ayilo 1& 2, Mirieyi, Mungula, Maaji, Alere and self-settled refugee in Adjumani Town Council. This has been due to the civil and tribal war in the South Sudan which started since 1980s to date.

The refugee population has resulted into pressure on social services delivery and frequent outbreak of epidemics in the District.
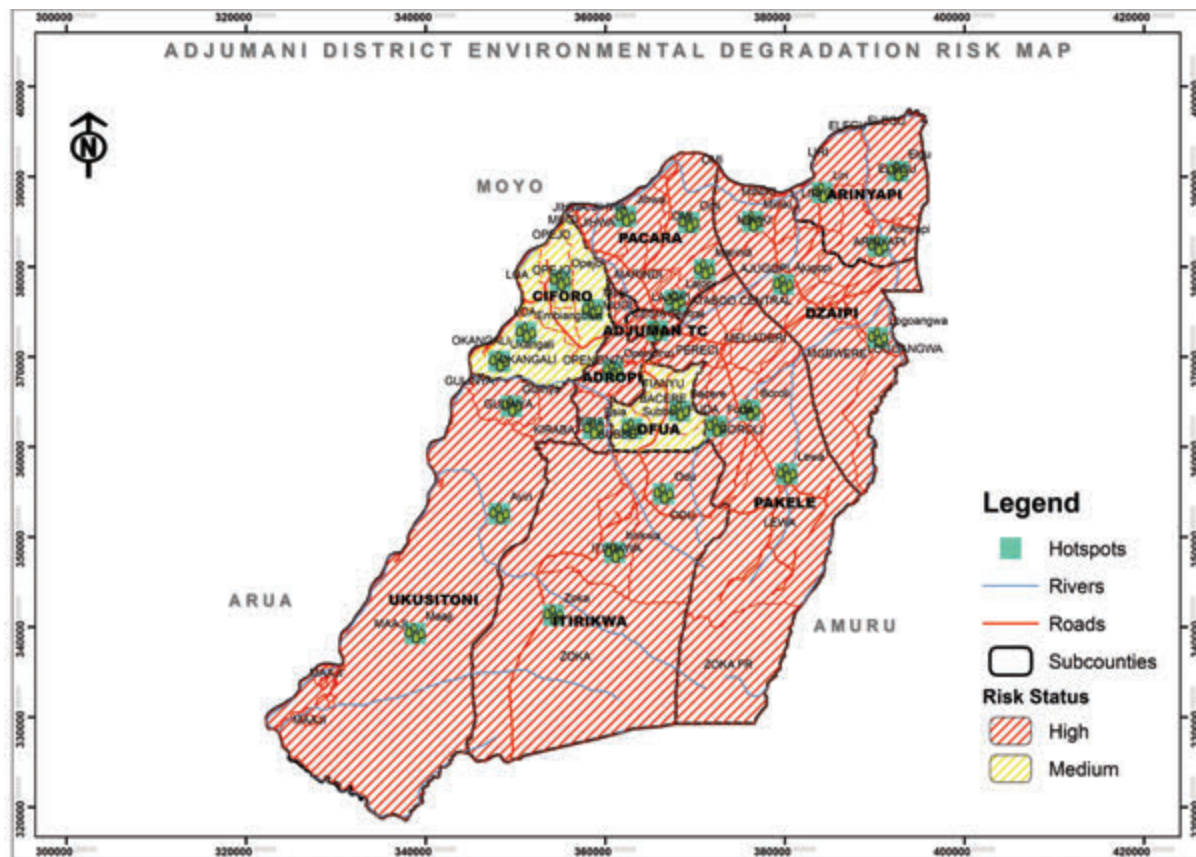
Environmental Degradation

Figure 11: Environmental Degradation Risk Map

Environmental degradation is the disintegration of the earth or deterioration of the environment through consumption of assets, for example, air, water and soil; the destruction of environments and the eradication of wildlife. It occurs when earth's natural resources are depleted and environment is compromised in the form of extinction of species, pollution in air, water and soil, and rapid growth in population. This has been registered high in Subcounties of Adropi, Arinyapi, Dzaipi, Itirikwa, Adjumani Town Council, Pachara Pakele and Ukusijoni, while Ciforo and Ofua are medium (fig 11). The key environmental degradation areas are Zoka Central belt, riverbanks, the Nile belt, refugee settlements and the Town Centres. These are caused by bush burning, illegal felling of trees, charcoal production, high demand for firewood, brick laying and burning, construction ,excessive waste in Towns and the increased population due to the refugee influx resulting into food insecurity, disease epidemic and loss of lives.
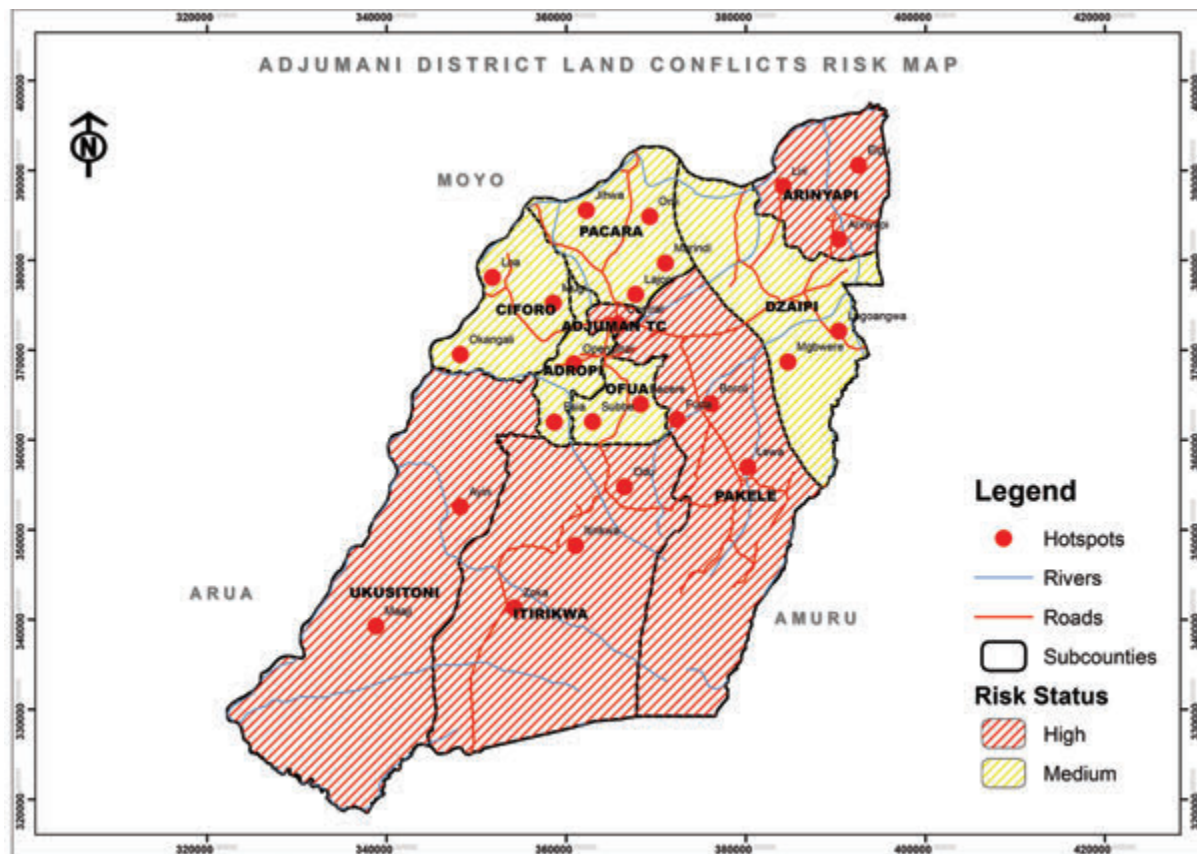
Land Conflict:

Figure 12: Land Conflicts Risk Map

In Sub counties of Ofua, Itirikwa, Arinyapi, Dzaipi, Ciforo, Pakele and Adjumani town council experience high level of land conflict unlike in Ukusijoni, Pachara and Adropi which registered moderate level of land conflict. The high instances of land conflict have been registered in the following areas; Adjumani and Amuru District Boarder areas (Apaa), Elegu (land wrangle between Ofodro Clan and Oyapele clan of South Sudan in Arinyapi Sub county), Sub county boarders: Dzaipi – Arinyapi (Nyumanzi), Ofua-Itirikwa (Mungula Parish), Ukusijoni-Itirikwa(Oninyaraku village), village boarder areas: Abiricaku – Karoko in Adjumani TC, Clan land: Pakwinya, Sukari, Boroli, Zoka, Opejo, Ciforo Central, Pagirinya. Majority of land conflicts in Adjumani are; Political interests, uncompleted boarder demarcations, economic hardships and high population which has resulted into poverty, loss of lives and property, and insecurity.
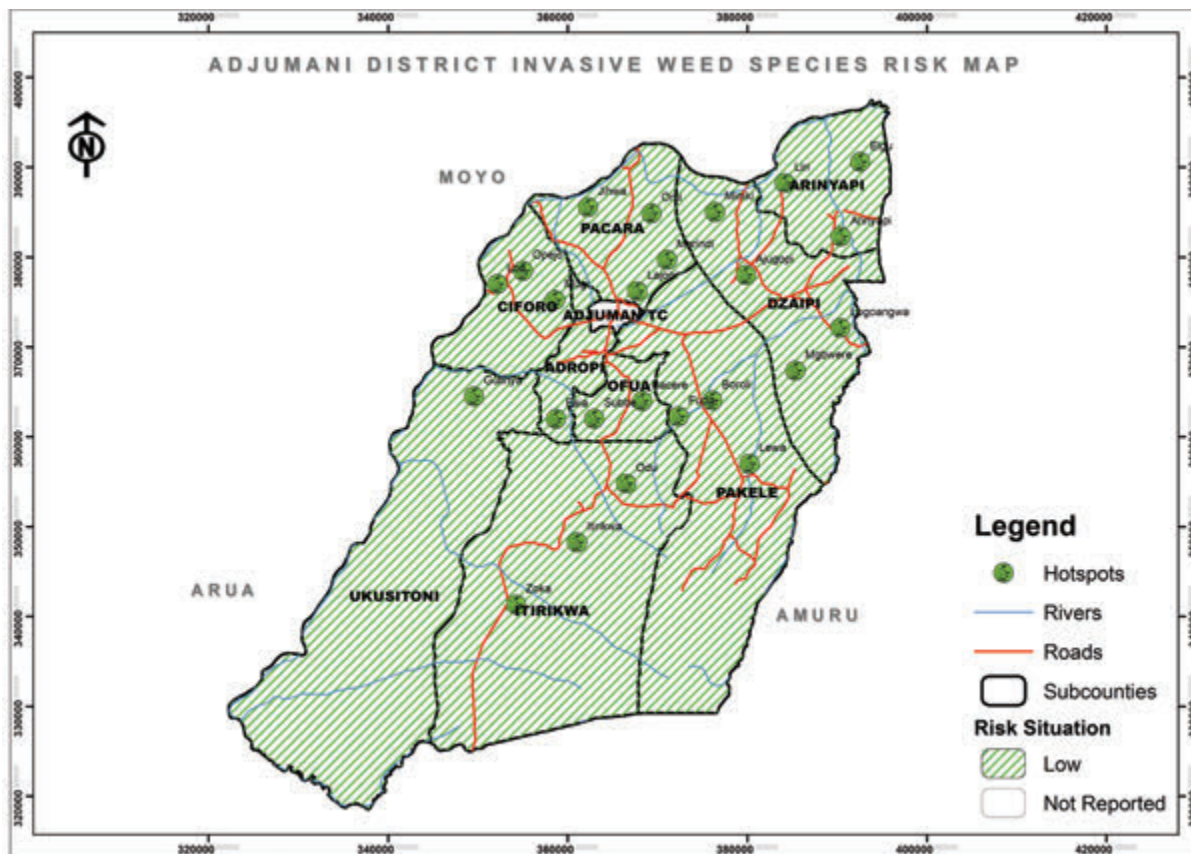
Invasive Weeds;

Figure 13: Invasive Weeds Risk Map

It has been registered low in all the Sub-counties (fig 13). The invasive weed species are found both in the waters of the Nile and on land surface. There is presence of water hyacinth in the Nile in the Sub counties of Achara, Dzaipi, Ukusijoni, Ciforo and dangerous species of weeds on the arable land which negatively impacts on crops and animal growth. This is due climatic change resulting into reduction in the number aqua species and land fertility. Invasive plants cause ecological disruption to natural ecosystems, but the severity of the impact varies considerably based upon the plant species and the area being invaded.
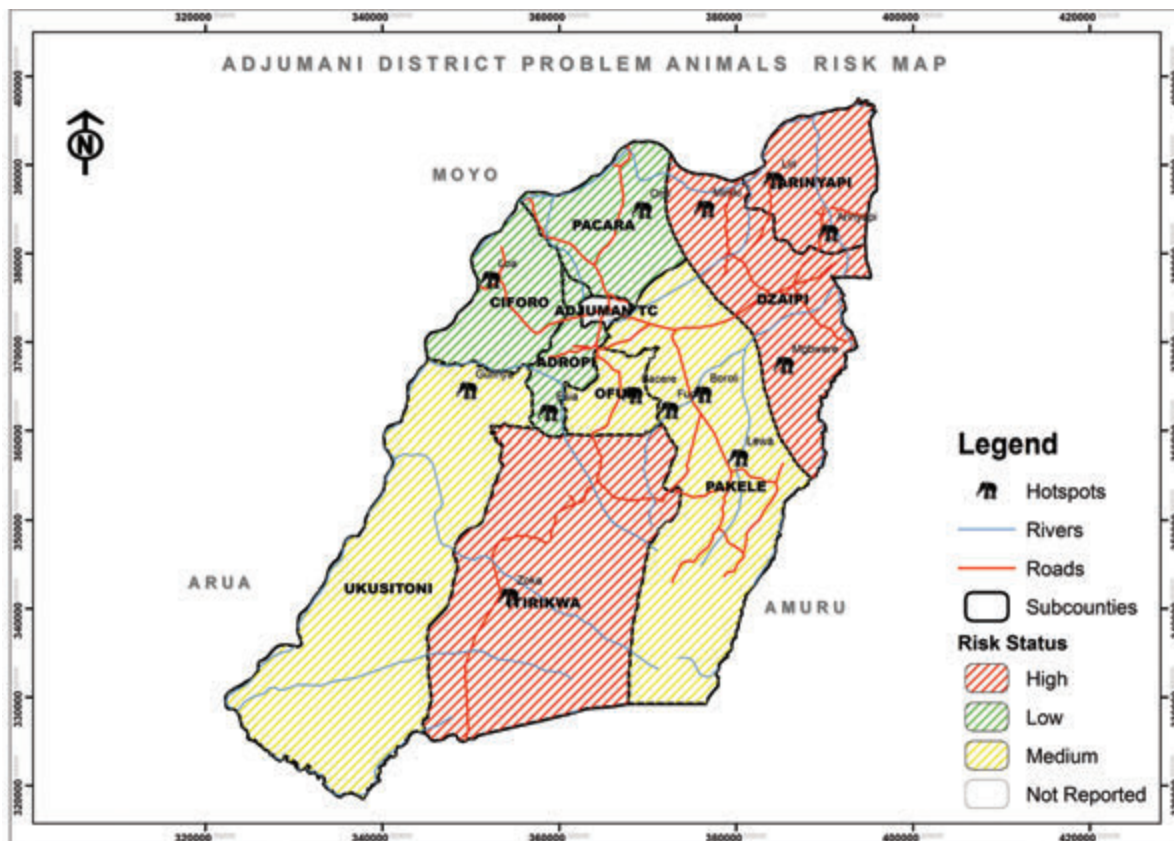
Wild Animals

Figure 14: Problem Wild Animals

Uganda Wildlife Authority (UWA) last year confirmed that, they have for the past one year managed to scale down the level of regular invasion by marauding elephants in the sub-counties of Arinyapi and Dzaipi in Adjumani District. Trans-boundary elephants especially from Nimule National Park in South Sudan have on several occasions destroyed numerous acres of food crops belonging to hundreds of small scale farmers in the two sub-counties. Last year hundreds of farmers in Arinyapi and Dzaipi Sub-counties threatened to drag the Government to court for failing to compensate hundreds of acres of food crops which they claimed were destroyed by elephants. Figure 14 above shows Itirikwa and Dzaipi as the most affected sub counties whereas in the Town Council cases were not reported. There are cases of wild animals like elephants, hippopotamus, crocodiles, monkeys, baboons, wild pig in Arinyapi, Dzaipi, Pakele, Itirikwa, Ukusujoni, Pachara and Cioro Sub counties that destroy crops during flowering and harvesting seasons. This is caused by human encroachment into their habitat resulting into community conflict with Uganda Wild Life Authority and the Government.

Vulnerability

Table 4 summarizes the communities' assessment of hazard severity and frequency in the Sub-counties. Table 5 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

| Hazard Category	Sub Counties									
	Adropi	Adjumani Tc	Arinyapi	Ciforo	Dzaipi	Ofua	Itirikwa	Pachara	Pakele	Ukusijoni
Human Disease/Epidemics	3	3	2	2	3	2	3	2	3	2
Crop Diseases	1	1	1	1	1	1	1	1	1	1
Animal Diseases	1	1	2	2	2	2	3	2	2	3
Prolonged Drought/Food Insecurity	2	2	2	2	2	2	2	2	2	2
Bush Burning	3	1	3	3	3	3	3	3	3	3
Floods	2	2	3	3	2	1	1	3	1	3
Suicide	2	2	1	1	1	2	2	2	2	2
Hailstorms & Lightning	1	1	1	1	1	1	1	1	1	1
Strong Winds	2	2	2	2	2	1	1	2	2	1
Refugees Influx	2	3	2	2	3	2	3	3	3	3
Environmental Degradation	3	3	3	2	3	2	3	3	3	3
Land Conflicts	2	3	3	3	3	3	3	2	3	2
Invasive Species Of Weeds	1	0	1	1	1	1	1	1	1	1
Wild Animals	1	0	3	1	3	2	3	1	2	2
	26	24	29	26	30	25	30	28	29	29
Vulnerability	9	8	10	9	10	8	10	9	10	10
Scores: High = 3, Medium = 2, Low = 1, Not reported = 0										

Risk Vulnerability
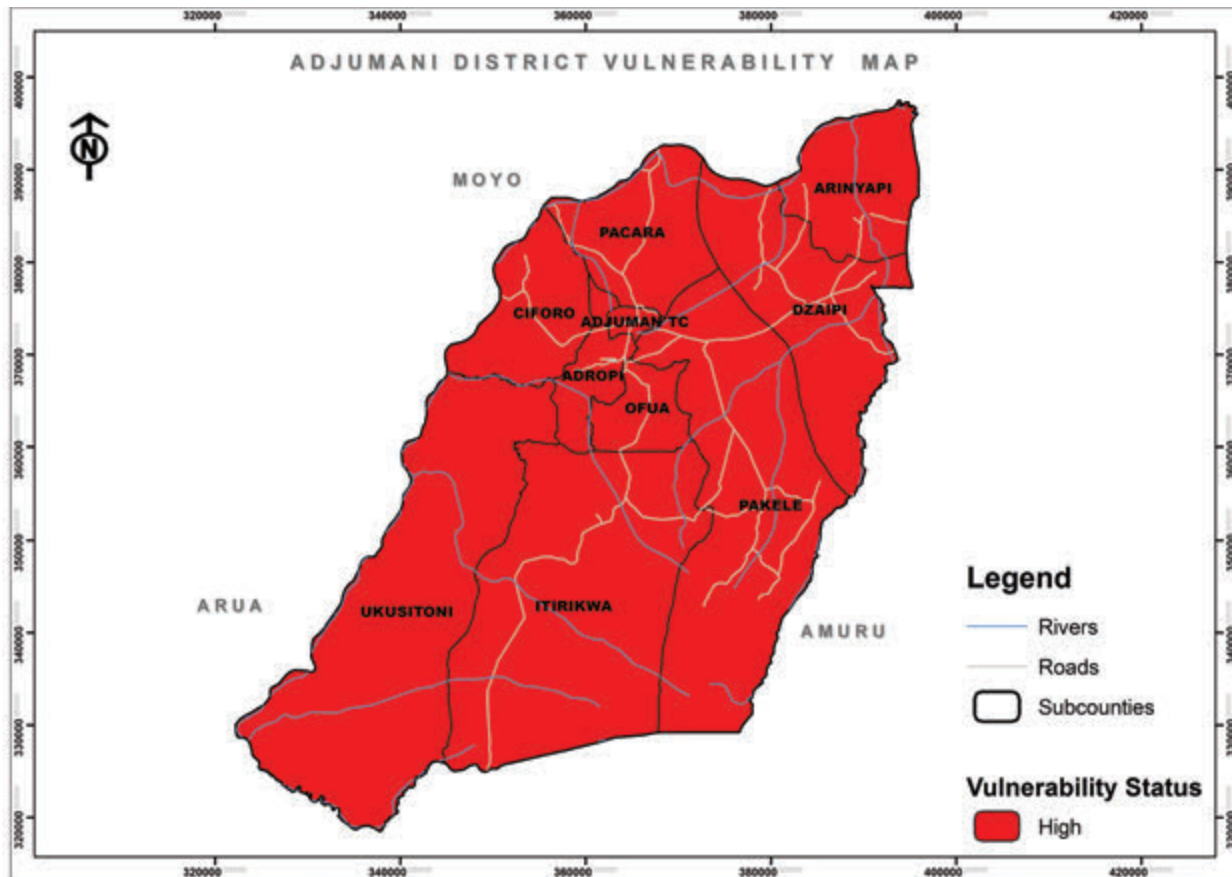
Figure 15: Vulnerability Map

The vulnerability map in Figure 15 shows the areas of high vulnerability according to the risk and vulnerability table (Table 7) 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 8 or more are coded "high", termed high vulnerability areas and are represented by red.

Adjumani District is exposed to 14 hazards namely human disease/epidemics, crop diseases, animal diseases, prolonged drought/food insecurity, bush burning, floods, suicide hailstorms & lightning , strong winds, refugees influx, environmental degradation, land conflicts, invasive species of weeds and problem wild animals arranged in their order of risk from highest to lowest .

The most rampant hazards in the district are bush fires, environmental degradation, land conflicts, refugee influx and lastly but not least floods. These are driven by a number of factors such as the need to clear land for cultivation, search for edible rats, resulting into loss of property and environmental degradation. Heavy rain seasons causing families to be displaced, destruction of several crop gardens. other factors include the civil and tribal war in the South Sudan resulting into pressure on social services delivery and frequent outbreak of epidemics , illegal felling of trees, charcoal production, high demand for firewood, brick laying and burning, construction ,excessive waste, Political interests and high population increase.

All Sub-counties reported a high level vulnerability with a weighted vulnerability of 8 and above which lies at the top (red) of the vulnerability scale.

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

Conclusions

This multi hazard, risk and vulnerability profile for Adjumani 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 Adjumani perceive each of the hazards based on the past trends and the predicted likelihood of their occurrences and impact on the communities.

It was established that Adjumani District is exposed to 14 hazards namely human disease/ epidemics, crop diseases, animal diseases, prolonged drought/food insecurity, bush burning, floods, suicide hailstorms & lightning, strong winds, refugees influx, environmental degradation, land conflicts, invasive species of weeds and wild animals.

Bush fires, environmental degradation, land conflicts, refugee influx and floods were ranked as the most widespread and disastrous of the fourteen hazards.

All Sub-counties reported a high level vulnerability with a weighted vulnerability of 8 and above which lies at the top (red) of the vulnerability scale but should be fortified against occurrences of new hazards 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 Adjumani 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.

Available online: http://www.necoc-opm.go.ug/