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TESO
KUMI District

HAZARD, RISK AND VULNERABILITY

PROFILE

June 2014

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Acronyms

CBPP	Contagious Bovine Pleuro-Pneumonia
CBSD	Cassava brown streak disease
CWD	Children with Disabilities
DDMC	District Disaster Management Committee
FIEFOC	Farm Income Enhancement and Forest Conservation Project
FM	Frequency Modulation
GIS	Geographic Information System
GPS	Global Positioning System
HDI	Human Development Index
HIV	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
HPI	Human Poverty Index
ISFG	Integrated Support to Farmers Groups
LGMSD	Local Government Management and Service Delivery
LLG	lower-level government
MDG	Millennium Development Goals
MFI	Micro-finance institution
MS	Microsoft
NAADS	National Agriculture Advisory Services
NEMA	National Environmental Management Authority
NFA	National Forestry Authority
NGO	Non-Government Organization
NUSAF	Northern Uganda Social Action Fund
OPD	Out-patient department
OPM	Office of the Prime Minister
PAF	Poverty Action Fund
PRDP	Peace, Recovery and Development Plan
SAARI	Serere Agricultural and Animal Research Institute
SACCO	Savings and Credit Cooperative Organization
TC	Town Council
UBOS	Uganda Bureau of Statistics
UNDP	United Nations Development Programme
UPA	Uganda People's Army
UPE	Universal Primary Education

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Hon. Hilary O. Onek

Minister for Relief, Disaster Preparedness and Management

EXECUTIVE SUMMARY

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

This hazard, risk and vulnerability profile was produced using a four-phased approach:

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, climate, administrative arrangements, natural resources, gender demographics by sub-county, livelihoods, agricultural production, poverty and environmental degradation.

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.

Kumi District is located in Eastern Uganda, approximately between latitude 1°10` and 1°35`north and longitude 33°30` and 34°20`east. It borders Bukedea and Nakapiripirit districts in the East, Ngora district to the West, Katakwi districts in the North and Pallisa district in the South.

The Kumi profile ranks ten hazards endemic in the district: floods, environmental degradation, severe storms: hail, lightning, food insecurity, crop and animal diseases, pest infestations, vermin, mines and unexploded ordinance, cattle theft and land conflict.

Although flooding in Kumi District has not had as severe an impact as in some other districts, it is still problematic in Kumi, Mukongoro and Ongino sub-counties. The communities perceive themselves to be highly vulnerable to environmental degradation in all sub-counties. Kumi sub-county suffers from high vulnerability to pest infestation, storms and food insecurity; the communities in the remaining sub-counties judge themselves to be of medium vulnerability to these hazards. Land conflict has medium impact in all sub-counties.

Kumi and Ongino sub-counties register high vulnerability in four of the ten hazards, making them particularly prone to disasters of aggregated hazards.

INTRODUCTION

Like the other districts in the sub-region, Kumi is prone to a range of hazards and associated disasters including floods, crop and animal epidemic, severe hails storms, land conflicts, pest infestation, environmental degradation, pest infestation, drought and food insecurity. Disasters in Teso sub-region have been increasing from year by year, especially flooding, which severely damages infrastructure and livelihoods.

This multi-hazard mapping was implemented in Kumi district among others to reduce the population's vulnerability to natural disasters and to prepare district disaster profiles that will aid decision making and planning. Flood and hail storms storm pose risks to life, property and livelihoods and are compounded by physical exposure and proximity to hazard-prone areas, as well as socio-economic, and cultural and behavioral conditions.

The hazard mapping profiles district disaster risks and vulnerabilities. It is a guide to aid decision making, development planning and design of interventions, to minimize loss of economic resources, infrastructure, physical assets, human resources and environmental capital, and to reduce the population's vulnerability to disaster.

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 risks in Kumi 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 Teso 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 Teso and Rwenzori sub-regions) 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 analyzed the collected data, and developed thematic disaster maps by integrating features generated from GPS data with base maps and high resolution satellite images.

The main activities at this phase included:

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

Methods used for data analysis. Data analysis methods used are the following:

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

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

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

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

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

Phase IV: 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

Location

Kumi District is located in Eastern Uganda, approximately between latitude 1°10` and 1°35`north and longitude 33°30` and 34°20`east. It borders Bukedea and Nakapiripirit districts in the East, Ngora district to the West, Katakwi districts in the North and Pallisa district in the South. The District headquarters is in Kumi Town Council, a distance of about 305 kms from Kampala.

The district has a total area of 1,055.8 km^2, out of which 902.48 km^2 is land area and 153.32 km^2 (14.5%) are covered by open water bodies and swamps/wetlands. The main water bodies are Bisina, Opeta, Nyangwo, Meito and Nyasala lakes.

Historical background and administrative set up

Kumi was gazetted as a district in 1975 from its mother Teso district. Formerly known as South Teso, the Teso sub-region now comprises Kumi, Bukedea, Katakwi, Ngora, Serere, Amuria, Soroti and Kaberamaido districts. In 1980, the name South Teso was changed to Kumi. Kumi district is made up of one county (Kumi), seven sub-counties, one Town Council, 83 parishes and 170 villages.

Climate and vegetation

The District is characterized as savannah grassland, with poor tree cover mainly due to indiscriminate cutting of trees. Nationally, Kumi district has one of the lowest bio-mass covers. The district climate is the modified equatorial type. The rainfall pattern in the district is bi-modal with peaks in April – May and July – August. The annual mean temperature is 24 C and rainfall is 800 – 1000mm.

In the recent past rainfall patterns have become erratic and unpredictable, resulting in frequent food shortages. Heavy dependency on fuel wood for domestic everyday needs and poles for building has resulted in deforestation. This has had an impact on the weather pattern in the district.

Topography and soils

Kumi District is generally flat with few undulations and isolated inselbergs in Nyero, and Mukongoro sub-counties.

More than half of the district soils are sandy posing a great risk of leaching and erosion especially when poor cultivation methods are used. With continuous cultivation of such soils, fertility diminishes and few farmers add nutrients to the soil. The water carrying capacity of sandy soils is low compared to loam clay soils.

Environment and natural resources

The Natural Environment in the district has continued to suffer abuse and degradation because more than 95% of the population relies directly on natural resources for a living. Extraction rate, use and management of ecological services and natural resources are not sustainable. Many factors contribute to the continued degradation of environment and natural resource base. They include the following:

- There are limited existing environmentally-friendly alternative livelihood technologies.
- There is weak enforcement of environment wetland laws.
- Environment and natural resource management is under-funded. The department is one of the least funded.
- High population growth rate (34%) leads to land fragmentation.

- Ineffective law enforcement and low capacity of law enforcers.
- Non-uniformity of implementation of environment management interventions.
- Little or no capacity in environment management among stakeholders including policy makers and technocrats at all levels, law enforcers, prosecutors and magistrates.
- The high poverty level forces people to over-exploit environment and natural resources for livelihood and income generation.
- Although government projects normally mainstream environment concerns, there is little or no mainstreaming of environment awareness and intervention in private sector activities and projects, with negative impacts on the environment. They therefore have little or completely no mitigation measures in their activities. There are few NGOs/CSOs directly engaged in the environment/natural resources sector.
- During the 2006 national and local elections, the environment and natural resources became electoral issues. Wetlands suffered most from degradation because wetland abusers became complacent to the longer-term consequences to their livelihoods.
- Need for quick money by local communities, which is typical of poor people.
- Negative attitudes and silent resistance to sound environment and natural resources management, which have immediate costs to stakeholders.

Analysis of Critical Environment Components

Forests

The biomass cover in the district is still very low. Kumi is among over 22 districts in Uganda without forests. This was a basis for National celebrations of the 2006 World Environment Day being hosted by Kumi as an awareness tool. The rate of deforestation is generally higher than afforestation and reforestation rates. While there is no quantitative data to support this, most probably biomass levels are diminishing. Factors contributing to lower biomass cover include expansion of arable land, higher level of brick burning, fewer tree nurseries and seedlings raised, inadequate capacity for use of energy saving technologies, indiscriminate tree cutting and inadequate law enforcement. Deforestation is high district wide. This was identified in both Parish and Sub-county Environment Action Plans (PEAPs and SEAPs). Women and children walk distances of up to 10 km or more in search of firewood. When environmental resources become scarce, women, children, PWDs and PHAs suffer most. However, FIEFOC and NEMA are supporting tree planting in Kumi. The challenge is that many seedlings perish due to livestock grazing, droughts and unreliable rainfall attributed to climate change. Under FIEFOC, over 300,000 assorted seedlings have been planted but over 30% of the seedlings have died.

Wetlands

Wetlands constitute a significant proportion of the total land area. Some district wetlands are of international importance; for example, Lake Bisina and Lake Opeta are now in the Ramsar List. Poor paddy rice cultivation practices and overgrazing are key threats to wetlands. Although laws and regulations exist, many stakeholders are unaware of their proper roles in wetlands management, causing continuing degradation.

Over 80% of the district wetlands have been modified due to almost all permanent wetlands becoming seasonal. Wetland degradation due to poor paddy rice cultivation remains high in the sub-counties of Kanyum, Mukongoro, Nyero, and Atutur among others. Wetland ordinances expected to reduce wetland degradation has not been implemented due to political interference.

Consequences of wetland degradation have already been felt. Cases of conflicts over access and ownership of wetlands has increased. Many groundwater sources have either dried up or the water yield has significantly reduced. This affects achievement of MDG 7. Claiming wetland ownership by some individuals has worsened wetland management.

Many protected springs, wells and boreholes dry up during the dry season. Communities in Kumi Town Council, Atutur and Kumi Sub-counties spend hours waiting for water or walk long distances in search of water. There are also conflicts among different wetland resource user groups. Fetching water at night makes girls and women vulnerable to sexual assault, leading to deepening social disharmony and spread of sexually transmitted diseases including HIV/AIDS.

Water resources

The district has the following protected water sources: 242 boreholes of which 192 are functioning; 150 shallow wells, of which 128 are functioning; 18 water kiosks located in Kumi Town Council and 100 protected springs. The unprotected springs and hand-dug wells are 110 and 190 respectively; some of them are not protectable. Kumi Town Council has pumped boreholes as the source for a piped water network, but the system functions erratically due to fluctuations in the water table and availability of power. The Mukongoro trading centre water system has been constructed and awaits connection to a reliable water source.

The district has Lake Bisina as a potential source of water for the provision of a piped water network. Kumi Hospital extracts water at Oseera. The district safe water coverage is 61%

(June, 2009), down from the figure of 62% recorded in December, 2006. Rapid population growth and poor facility maintenance are cases of the decline in safe water coverage.

Land management

The department is charged with overall management and administration of land at all local government levels. The department undertakes various activities notably, registration of legal interests in all the four tenure regimes, surveys, oversees land management institutions and builds their capacity, provides technical and legal advice to the chief executive and general advocacy to the public.

The District Land Board, the land management institution, is approving legal interests in land. The Area Land Committees in the 7 Lower Local Governments (LLG) were nominated by the respective sub-county councils, approved by the district council and are actively involved in boundary opening in all the seven LLGs.

Meteorology

The weather and climate patterns in the district are erratic. Climate variability has reduced farmers' confidence in having timely and auspicious agricultural conditions. Rainfall, humidity, temperature and wind speed among others change unpredictably. Consequently planning for activities such as crop cultivation which rely on weather has been difficult.

Monitoring weather and climate change is critical. Communities need to know how to mitigate and adapt to the impacts of climate change. The district has no weather expert. The person currently assisting in data collection and maintenance of the weather station works with Serere Agriculture and Animal Research Institute (SAARI). Manual and automated weather instruments record weather observations on daily basis; however, the capacity to maintain, operate, analyse, interpret and predict weather data is inadequate.

Waste management

In the district generally and particularly in urban and rural growth centres, poor solid waste management is increasingly becoming a problem. There is indiscriminate waste disposal, about which the general public lacks awareness. There are no formal areas for waste dumping. But through capacity support, the department trained at least 30 sub-county leaders in sound solid waste management approaches. Kumi Town Council has a plan to buy and gazette a solid waste dumping site several kilometers outside of the town but has not yet achieved it. Poor solid waste management, particularly of plastics, will continue to be a serious environmental problem in all urban and emerging rural growth centres.

Land use planning

The district is charged with the overall management and administration of physical planning in all the seven Lower Local Governments. The department ensures that any development carried out is compliant with the approved cadastral layouts. It generally tries to discourage slum developments. However, enforcement of physical planning laws and regulations specifically in rural growth centres where owners oppose these constraints, has presented the department with challenges. The efforts of the land department technical staff have been ineffectual due to lack of funds for compliance monitoring and enforcing penalties to deter perpetrators of unplanned development.

Noise pollution

Noise means an undesirable sound that is intrinsically objectionable or that can cause adverse effects on human health or/and the environment. Noise is increasingly becoming nuisance. During the 2011 national and local elections, noise generation and frequency was at its highest. The noise is also generated from discos organised by guest houses and hotels. Advertising companies also generate objectionable noise. Noise is particularly an issue at night. In general, venues where noise is generated are not sound proof.

Opportunities for environment/natural resource management

The District has a number of opportunities for improvement of Environment/Natural Resources Management. They include the following:

- There are legislation frameworks such as National Environment Act Cap. 153 which advance sound environment management.
- Existence of the National Lead Agencies like NEMA NFA, and Wetlands Management Department could provide necessary capacity building and technical backstopping to the district local government.
- Local radio FM stations exist in the Teso Sub-region for disseminating information on environment and natural resources management.
- Uganda Police force and the magistrate courts exist in the District to enforce the existing laws and prosecute offenders.
- There are several funding sources from which environment management improvement can be supported, including PAF, FIEFOC, PRDP, NUSAF 2 and LGMSD among others.
- Legal structures exist in the District and sub-county local governments for environment and natural resources management.
- Many civil society organisations in Kumi could incorporate environmental issues in their scope.
- The weather station exists in the District to monitor weather patterns.

In general analyses, environment issues are critical and have a direct bearing on poverty levels. As environment degradation is both a cause and a consequence of poverty, the high levels of poverty in the district are not unexpected. To reverse the rising environment degradation trend, implementation of both restoration and mitigation measures are needed, and all stakeholders need to play their roles actively and timely.

Human population

The final results of the 2002 Population and Housing census put the population of Kumi district (excluding the recently created Ngora district) at 165,365 persons, constituting 1.1 percent of the total country population. The annual population growth rate between 1991 and 2002 was 4.3%. Population density also increased from 96.3 in 1991 to 183.2 in 2002. With the population growth rate of 4.3%, the 2011 district population is projected at 244,500.

The composition of the population by sex in 2002 was 85,847 (51.9%) female and 79,518(48.1%) male. In the 2002 census, ethnic grouping analysis showed that Iteso constitute about 98% of the population, the others being Bakenyi, Bagishu, Sabinyi, Langi, Basoga and Kumam.

The population growth rate of the district between 1991 and 2002 alone was 4.3% per annum, much higher than the average population growth rate of the country as a whole, which was 3.3% per annum. This has serious implications for the overall district population growth. For example, whereas it took about 33 years for the district population to double from 1969 to 2002 at a growth rate of 2.2%, at the current growth rate of 4.3% the population doubled in just 13 years, from 1991 to 2002. This strains service delivery and natural resources in the district and means, for example, that the number of health units and schools should double within the next 16 years (from 2002), if the population is to continue to receive its current level of service delivery.

Population age structure and its implications to development

One of the implications of the rapid population growth rate is the transformation of the population structure from a relatively old to a more youthful one. A younger population means more resources are diverted from investment to consumption to meet the needs of children. At the household level when a family is spending the biggest proportion of its resources on food, clothing, education and health, by implication less physical development takes place. In Kumi district significant resources have been applied by government and other development partners, especially in education and health. Even so, poverty levels are still high and increasing, perhaps because the production sector has suffered at the expense of meeting the needs of the younger population.

The age structure of the population also has implications on the possibilities of stabilizing

population growth. With a population that is predominantly young, as in Kumi district, even if fertility rate were to fall drastically, population stabilization will be slow due to the "hidden population momentum". This is because the biggest proportion of the current population (i.e. 56 %) comprises many potential fathers and mothers, who even if they produce few children, will still contribute to rapid population growth.

Population density

Owing to the sharp increase in population between 1969 and 2002, the population density, i.e., number of people per km^2, has been similarly increasing as shown Table 1.

Table 1 Population and population density 1969 – 2002

Year	Total Population	Density	Uganda
1969	190,715	77.6	-
1980	239,539	97.5	-
1991	236,694	96.3	85
2002	165365	183.2	123.9
2011 (Projection)	244,500	271	175.3

Source: The 1991 and 2002 National Population reports.

The trend towards sharp variation between the population densities of sub-counties is clear in Table 2, reflecting an increasing strain on Kumi district natural resources.

The increase in population density is not uniform throughout the district, however. For example, the large difference in population density between the most sparsely populated sub-county Ongino with a density of 146 persons per km^2 and Mukongoro the most densely populated sub-county with a density of 321 persons per km^2 may be attributable to factors including security, rainfall distribution and soil fertility.

Table 2 Total Population, land area and population density by sub-county 2011

County	Subcounty	Total Population 2011	Total Area	Land Area	Population Density 2002	Population Density 2010
Kumi	ATUTUR	321,600	104.93	103.22	210	310
	KANYUM	41,700	140.10	139.78	202	298
	KUMI	34,300	144.11	121.79	190	282
	KUMI T.COUNCIL	13,000	11.27	11.27	793	1,154
	MUKONGORO	47,000	164.98	140.23	227	335
	NYERO	33.900	110.18	107.38	214	315
	ONGINO	42,600	380.23	278.81	103	153
District Total		244,500	1055.8	902.48	183.2	271.0

High population density affects the district negatively in many aspects as discussed below.

Reduction in average farm sizes reduces agricultural productivity. The 2002 census examined the number of plots operated by households, shown in Table 3. Independent research conducted in the district indicates cases of complete landlessness emerging in parts of the district. Kumi district must increasingly focus on intensive farming using high value varieties and breeds rather than extensive agriculture, in order to overcome this challenge.

Table 3 Total number of crop plots operated in 2002

Government Unit	Number of Crop Plots Operated						
	1	2	3	4	4-9	10-19	20+
Kumi	21.7	29.5	21.4	11.11	10.1	1.2	0.1
Eastern Region	16.3	21.0	17.1	12.0	17.2	3.3	0.8
Uganda	19	23.2	17.6	11.4	14.7	2.6	0.7

Source: The 2002 Population and Housing Census report on Agricultural Module.

Table 3 shows diminishing family land holdings with the majority of households now operating between 1 to 3 plots. Compared to the country as a whole, family holdings are owned decreasingly in Kumi district, leading to decline in soil fertility and hence less productivity.

Population density forces encroachment into the wetlands and other previously conserved natural resources like forest reserves, with serious environment implications. Already Kumi district has one of the lowest biomass covers in Uganda and weather changes are beginning to be felt in the form of erratic weather patterns. Environment degradation also has a serious impact on women who have to walk longer distances looking for water and firewood.

Households and livelihoods

The 2002 census captured information on major sources of household livelihoods. Of the total number of households registered in 2002 (52,672), the majority 48,985 (93%) were engaged in agriculture, unsurprisingly since industry and services are barely developed in the district. This over-dependence on agriculture has serious implications for development in Kumi district.

Between 1991 and 2002, average economic growth in Uganda has averaged 6.5% per annum. This growth rate has not been uniform for all sectors with agriculture growing only at 4.0% per annum, compared to 10.1% for industry and 7.4% for services. High levels of poverty in the district reflect the low growth of agriculture coupled with the high rate of population growth (4.3%). With the growth rate of agriculture even falling further in 2006/2007, the situation is only worsening.

Secondly, population growth, increasing population densities and low levels of diversification

of livelihoods increases the vulnerability of the population in the district to shocks like drought and other hazards. Persistent food shortages in the drier belt of Kumi and Ongino sub-counties exacerbate the stress.

Gender situation analysis

The 2002 Uganda Census of Population and Housing indicates that women outnumber men in Kumi. Females constitute 51.9% (85,847) of the population, versus 48.1% (79,518) males. However, despite their majority, the status of women in Kumi District has deteriorated in various dimensions.

Gender Issues in agriculture

Agriculture is the backbone of Uganda's economy and source of livelihoods of the people. Over 93% of households are engaged in agriculture, mainly through subsistence farming (68%). More than 70% of the agricultural labour force is provided by women, yet only 30% have control over means of production and only 7% own land. Women are less educated, with 69% illiterate, according to the 2002 census.

Because of the above facts, there has been limited adoption of modern technologies by the women due to their low education levels and the cultural factors that hinder free interaction between women and extension workers, most of whom (70%) are men. This limits women's access to relevant programmes like the National Agriculture Advisory Services (NAADS). Also women's multiple roles do not allow them adequate time to attend meetings given the long distances to the often centralized meeting venues. Usually women farmers are left out from study tours because they are rarely seen in farmer meetings.

Even so, there is wide participation of women in the whole range of agricultural production, from planting, weeding, harvesting to post harvest handling and storage. However, decisions regarding marketing and disposal of income from the produce are solely for the "Head of household" – the man. Women need to participate in all processes aimed at modernizing agriculture.

Gender and education

School enrolment of both boys and girls has increased significantly since the introduction of Universal Primary Education (UPE) in 1997. Prior to UPE in 1996 enrolment in primary schools was 67,036. This rose to 134,255 in 2004. The dropout rate has fallen over the years, according to assessment of succeeding cohorts of education. Other general dimensions of gender in the district include:

- The dropout rate of girl children is steadily decreasing, while the trend fluctuates among the boys.
- The enrolment at primary one has more girls than boys, but fewer girls complete in primary seven than boys, suggesting a higher dropout rate of girls than boys.
- There is a higher rate of dropout of girls (40%) especially in primary four and five as

compared to other classes.

- Basing on the above factors, the following are some of the issues associated to the high drop-out rate of pupils, especially girls:
- Some schools lack sanitary facilities (pit latrines) or have facilities which are not maintained, which provides the likely cause for high dropout of girls of P.4 and P.5, who are at the ages of experiencing their first menstruations periods.
- Boys and girls have become sexually active at 13 years for girls and 15 years for boys. This has exposed them not only to STDs but also to early pregnancy leading to many instances of child mothers especially in the sub-counties of Ongino and Atutur; and subsequently child marriages which has affected both boys and girl children.(Probation reports).
- Heavy workload for the girl child both at school and home which affects their education and performance, with limited support and encouragement from parents and teachers.
- There is inadequate gender awareness, gender sensitivity counselling and career guidance in schools and communities for both girl and boy children.
- Children with Disabilities (CWDs) are not given adequate support and attention in their education by parents, teachers and community. There are limited materials for Special Needs Education with equally few programmes in place to improve on the facilities to cater for boys and girls with special educational needs, and technical and vocational education is unaffordable by many disadvantaged boys and girls. There was a total of 7,535 CWD vs 149,132 children in 2005. Such children need adequate interventions if they are to compete on a levelled ground with others.
- Food insecurity at home forces girls to drop out of school to assist parents in livelihood tasks. This is common in the dry belts of Ongino sub-county and Mukongoro sub-county, especially in Agaria parish.

Gender and health

The general rise in the total fertility rate observed in Kumi from 6.3 in 1991 to 7.1 in 2002 implies a high population growth rate and decline in the health status of both mothers and children. The high illiteracy among women (69%) makes matters worse, coupled with their low decision-making powers for seeking health care. This is attributed to the cultural norms that make women submissive to men, resulting in issues affecting the health sector such as:

- Low utilization of family planning practices by women leading to high birth rate and subsequent strain on government services.
- Condoms are the main contraceptive methods among youth. Birth-control pills are used mainly by only educated women. Other family planning methods such as IUDs are not readily available.
- Health centres have insufficient drugs and supplies. 85% of the population is within 5km

of a health facility.

- Health services are offered in all health units through a weak referral network at community level.
- Women and children tend to seek health services more than men. In the last year, 67% of the total out-patient department (OPD) attendance for persons of 5 years and above were female compared to 33% for males.

Kumi district recognizes gender as a development concern that needs to be mainstreamed in all sectors. In line with this, the district has developed a gender mainstreaming strategy to guide action towards achieving gender sensitive development and benefits to all stakeholders. The strategy document recommends best practices and strategic actions to be adopted by different stakeholders and sectors in the district. Development programmes implemented in the district indicate the commitment to mainstream gender in the development process. In the water sector, at least 50% of all the protected water sources user committees are headed by women, and women form at least 50% of each committee. At least one woman is in an executive position on the committee. In the Works sector, women participate in road maintenance and some have accessed contracts through the tendering process. Health seeking behaviour as shown by OPD attendance seems to be high among women even though they do not possess or control household income nor have a voice on decision making.

In the education sector, out of 173 primary head teachers, 53 are women and this proportion is planned to increase. However, gender relations are still remarkably unequal, indicating gender imbalances in the district and the need for more effort and commitment to address gender issues especially in the access, control and ownership of resources.

Economic activities

Table 4 Proportions of the population engaged in livelihood activities

	%
Agriculture	92.5
Agricultural produce trading	2.6
Employment income	2.0
Animal rearing	1.3
Fishing	0.7
others	0.6

Table 5 Livestock statistics as of february, 2010

Cattle	177,797
Goats	112,595
Sheep	25,039
Poultry	362,039
Pigs	45,110

Resources have been invested in productivity enhancement of agricultural enterprises in the district through demonstrations on the use of improved technologies in groundnuts, citrus, mangoes, sunflower cassava, sorghum, sweet potatoes, cattle, goats, chicken, pigs, fisheries, and bee farming, which farmers are adopting with encouraging results. The farmers in Kumi District are also engaged in other economic activities which include fishing on the 9 satellite lakes, small crafts and pottery, brick making, carpentry, joinery and building.

The NAADS programme is six years old in the district and is currently covering all sub-counties, including Kumi Town Council. Public Extension advisory services have reached a total of 12,000 from 633 farmer groups. The major enterprises being promoted include poultry, groundnuts, piggery, bee keeping and citrus. The NAADS program encourages group approaches for both advisory technology and marketing purposes. High level farmer associations exist, such as the Tropical Fruit Groups Association and the Diary Association which help to address marketing constraints experienced by farmers. Another limiting factor is capital for commercialization of apiculture. Maintaining farmer associations operational is a challenge; past experience has shown disintegration. Under integrated support to farmer groups, the ISFG capacity building component is helping to strengthen farmer groups.

United Nations Development programme (UNDP) funded establishment of a fish hatchery at Atutur sub-county. The hatchery is operational. Six beneficiary farmers from each parish have already been identified and technologies procured and distributed to the beneficiaries.

The volume of trade in the district is still low since most of the businesses are in agricultural produce (raw material) or light manufactured goods. However, there is potential for agro-processing industries to develop.

Kumi District has a tourism potential especially at the historical site of the Nyero Rock Paintings and Tisai Island which is home to rare bird species. Other tourist resources such as hotels, bars and restaurants are developing rapidly in the growing trading centres of the district. A number of renewable energy resources can be exploited in the district including biomass, solar and wind.

Farmers are already involved in small micro-credit and savings activities which can be expended using the MFI/SACCOs to enhance farmers' productivity.

Poverty, livelihood analysis and vulnerable groups

Human development index (HDI)

Kumi district remains one of the poorest districts in Uganda. The Uganda Human Development Report 2005 (UNDP 2005) ranked Kumi district as having one of the lowest human development index values in the country of 0.423 compared to the highest index of

0.615 recorded in Kampala, followed closely by Wakiso district with 0.601.

Human poverty index (HPI)

The Human Poverty Index (HPI) is a metric developed by UNDP to measure the level of deprivation of the population in three major dimensions, also captured by the HDI. These are a long and healthy life, knowledge and a decent standard of living. The closer the index is to zero, the better the progress toward reducing poverty.

Using data collected for 56 districts in 2007, the Uganda Human Development Report 2007, ranked Kumi district the 41st most deprived district in Uganda with an HPI of 27.2.

This indicates that the poverty levels in the district have improved since 2003 when it was nearly 36.9%. The district's improved ranking in this measure is attributed to good performance in the knowledge measure due to increases in literacy as well as gains in life expectancy. The district is poorly performing in the health related indicators, especially the survival status of children, pregnant mothers and the general population. Low income levels indicated by the large population below the poverty line (World Bank's "dollar a day" international poverty line) also translates into low standards of living.

Extent and severity of poverty

According to the Uganda Bureau of Statistics (UBOS) in its Poverty Mapping Report over 55% of the population in Kumi district was below the poverty line in 1999. This is an improvement from the poverty indices registered in 1992.

The proportion of the population below the poverty line gives a quantitative measure of the population that is unable to meet the basics of decent life. These basics include shelter, food and health among others. In terms of the severity of poverty, this UBOS report indicated that in 1999 the poverty gap was still high at 35%.

Other manifestations of poverty in the district include the following:

- Literacy Rates: According to the 2002 Population and Housing Census, 64.5% of all people aged 10 years and above were literate. In gender terms, 76% of males and 54.3% of females were literate during the same period. This has been attributed to UPE, which led to an increase in enrolment in Primary Schools. The district also is conducting adult literacy classes with support from the central government, under the Poverty Action Fund (PAF) and other development partners. Literacy gains are among the factors contributing to significant improvement in HDI ranking of the district discussed above.
- Life expectancy: The 2007 Uganda Human Development report indicates that the average life expectancy at birth in the district was 56 years which has greatly improved as compared to the 1991 average life expectancy of 46 years. The life expectancy in the district during this period was much higher than that of the country, which was 50.4 years.

- Accessibility to health facilities: 85% of the district population is within 5 km of a health unit. The rest of the population (15 %) must walk long distances reduces access to medical attention and increases chances of mortality in situations where referral systems are weak. The district has put in place a referral system using motorized and bicycle ambulance systems to address some of these problems.

- Accessibility to safe water: Safe water availability is still low with only 61% of the total population accessing safe water. There is no doubt that most of the diseases suffered by the population have a relationship to the type of water the population drinks. With support from central government and various donors, the district has been able to progressively increase access to safe water from about 10% in 1997 to over 60 % in 2000. However the rate declined from that period. In the 2002 population census the safe water coverage was at 58 % and this has now risen to 62% due to increased investment in the sector. Water is one of the core challenges that the district needs to address in order to reverse the current threats to the already made gains.

- Sanitation Coverage: The proportion of households with pit latrines in the district increased to 53% in 2008 and to 72% in 2010. Although a few areas like Ongino Sub-County have unsuitable soils for the construction of pit latrines, the major cause of low latrines coverage in the district seems to be reluctance by the population.

- Disease burden: Malaria remains a major cause of morbidity accounting for at least 45% of all OPD cases in past years and 21% of mortality last year in the district. Ideal weather conditions and the prevalence of bushes and open water sources favour the breeding of mosquitos in the district. The district is tackling this challenge through many initiatives among which include indoor residual spraying and mass drug administration. Home based management of fever was implemented by the district with good results but has been hampered by policy changes and erratic drug supplies. The policy requires testing before any administration of anti-malarial drugs, and that means all treatment has to be sought from the health facilities. HIV/AIDS remains a concern as it contributes to at least 24% of all infant deaths of persons of 5 years and above in 2009-2010.

Poverty trends for the last five years

Although analyzing poverty trends in Kumi district local government remains difficult due to scant data and the multi-dimensional nature of the poverty, trends are evident in some indicators. This section attempts to measure poverty trends during the last five years by examining security, access to social services, income levels, human development index, human poverty index, life expectancy at birth, denaturalization, basic infrastructural development, HIV/AIDS, transformation of agriculture, environmental trends and general vulnerability of the population.

The Uganda Bureau of Statistics in its report "Poverty Mapping in Uganda" indicates that over 82% of the population in Kumi district was below the poverty line in 1992. This is quite understandable considering that the district was just getting out of insurgency during this period and the poverty situation in Uganda is strongly related to the incidence of insecurity. In 1999 the population below the poverty line fell from over 82% registered in 1992 to 55% in 1999 and 57 % in 2002. The baseline survey report undertaken by UBOS in 2004 for eighteen districts in Uganda under NUSAF indicated that the population below the poverty line in Kumi rose to 75%. This indicated a sharp reversal in poverty levels, not surprising considering that overall poverty increased in the country from 35% recorded in 2000 to 38% in 2003. However it indicates higher vulnerability to poverty in the district than in the country as a whole.

Income poverty levels have also not been uniform throughout the district with the highest levels experienced in Nyero Sub-County and the lowest in Atutur Sub-County.

Table 6 Population below the poverty line and the poverty gap 2005 by sub-county

Sub-County	Estimated Total Population 2005	Estimated no. of poor people 2005	Population below the poverty line 2005	Poverty gap (as % of poverty line) 2005
Atutur	24,407	11,203	45.9	13.8
Kanyum	31,891	14,702	46.1	13.5
Kumi	26,124	12,304	47.1	14.1
Kumi T.C	9,936		-	-
Mukongoro	35,903	14,613	40.7	11.5
Nyero	25,864	12,932	50.0	15.5
Ongino	32,446	13,076	40.3	11.5
District Total	186,571	83,881	45.0	13.1

Source: UBOS and International Livestock Research Institute (2008) Nature, Distribution and Evolution of Poverty and Inequality in Uganda.

Poverty pockets

The poverty situation is not uniform throughout the district. Areas of relatively higher poverty levels in the district can be identified. Geographically the eastern drier and rain shadowed areas of Ongino and parts of Kumi Sub-County which are more vulnerable to drought and food insecurity have more severe poverty. The sub-county of Ongino also borders Karamoja and so is more vulnerable to cattle rustling and insecurity.

Poverty is also more severe in more remote places of Ongino, for example, Tisai Island. There poverty is mainly a result of lack of access to basic social services like education, health units, roads and communication. Access to markets and other services as well as

lack of ability to attract public service staff also make them more vulnerable to poverty.

Table 7 Cause-effect relationship analysis of poverty in Kumi district

Issues	Causes	Effects
high incidence of disease burden	poor health seeking behaviours, illiteracy, and domestic violence	high medical bills, deaths, low productivity, poverty
deteriorating soil fertility	overuse of the land, no crop rotation, inadequate agricultural knowledge, assets-less widows and widowers	low marketable output and incomes
deteriorating weather conditions	draining wetlands and depleting vegetation cover	crop failure, famine and low incomes
poor species of animals and plant species	rigidity among farmers towards change, expense of improved varieties	poor breeds of animals, low market value, low incomes
high population	lack of population growth control, early marriage among the population, population unwilling to use family planning	land fragmentation, low savings, low incomes
high incidence of animal and plant diseases	poor culture of treatment of animals and crops	low yields, low marketable output, low incomes, food shortage
high levels of depletion of tree cover	increasing shortage of cultivatable land tree cutting high demands for charcoal, wood fuel	soil erosion, reduced watershed storage capacity, flash flood hazard, river siltation, low yields, famine, low incomes
high level of encroachment on wetlands	high population densities has led to shortage of land in uplands, loss of fertility has attracted use of wetlands	drought, crop failure, low incomes
food insecurity in communities	poor yields poor culture of food conservation high cost of food	famine, low incomes
high illiteracy levels among the female population compared to males	high dropout rates of girls, early marriages forced by parents	low adoption capacity of modern types of farming

HAZARDS

Table 8 Summary of hazards in Kumi district

Sub-County	Floods	Crop and animal Disease	Pest infestation	Land conflict	Mines and unexploded ordinance	Environ-mental degradation	Drought and Food Insecurity	Vermin	Hail storms	Vulnerability to aggregate risk
Atutur	✓	✓		✓		✓	✓		✓	6
Kanyum	✓	✓	✓	✓		✓	✓		✓	7
Kumi	✓		✓	✓		✓	✓		✓	6
Kumi TC	✓		✓	✓		✓	✓			5
Mukongoro	✓	✓		✓		✓	✓		✓	6
Nyero	✓		✓	✓	✓	✓	✓	✓	✓	8
Ongino	✓	✓	✓	✓		✓	✓		✓	7
Total	7	4	5	7	1	7	7	1	6	45

Table 9 Hazards

Hazard	Status	Sub-County	Rank
Floods See Figure 1	In the last quarter of calendar year 2007, two sub-counties bordering Lake Bisina wetland system suffered from flooding which caused loss of lives and property. Flooding is attributed to silting caused by environment and wetland degradation. Silting of Lake Bisina is caused by mismanagement of environment in catchments. This is both within Kumi District and those districts bordering Kumi which include Sironko, Kapchorwa, Nakapiripirit, Ngora and Bukedea.	Severe in Kanyum Kumi Kumi TC Mukongoro Nyero and Ongino sub-counties	1
Hail storm and lightning See Figure 2	Due to environment degradation and climatic changes, there are now frequent cases of erratic rains that are associated with heavy storms, lightning and hail storms. This is associated with destruction to crops, livestock and physical infrastructure. Many roofs of houses have been blown off by strong winds in schools, churches and homesteads.	Atutur Kanyum Kumi Mukongoro Nyero and Ongino sub-counties	2
Drought and food insecurity Figure 3	Cases of drought and food insecurity reported in the district	The situation is most pronounced in Ongino and part of Kumi Sub-Counties	3
Environmental degradation See Figure 4	The natural environment in the district has continued to suffer abuse and degradation because majority of the population continues to rely directly on natural resources for a living. Many factors contribute to the continued degradation of the environment and natural resource base including expansion of arable land, higher level of brick burning, fewer tree nurseries and seedlings raised, inadequate capacity to use energy saving technologies, indiscriminate tree cutting and inadequate law enforcement.	Deforestation is high district wide. Wetland degradation due to poor paddy rice cultivation remains high in the sub-counties of Kanyum, Mukongoro, Nyero, and Atutur	4
Land conflict See Figure 5	Land conflicts incidences are reported mainly resulting from conflicts on public land, land fragmentations and household level conflicts.	District Wide	5

Hazard	Status	Sub-County	Rank
Crop and Animal Disease See Figure 6	Incidences of crop and animal disease reported eg; cassava brown streak disease and the fruit and leaf spot on the citrus, cassava Brown streak disease (CBSD).	Atutur Kanyum Mukongoro and Ongino sub-counties	6
Pest Infestation See Figure 7	Cases of pests reported	Kumi Kumi T C Nyero and Ongino Sub-counties	7
Vermin See Figure 8	Monkeys destroy crops, most especially maize, fruit trees and potatoes.	Nyero Sub-County	8
Mines and unexploded ordinance	Incidences reported in district	Nyero Sub-County	9

RISKS

Table 10 Hazard risk assessment

Hazard	Atutur	Kanyum	Kumi	Kumi TC	Mukongoro	Nyero	Ongino
Floods	L	L	M	L	M	L	H
Crop and animal diseases	M	M	L	L	M	N	H
Pest infestations	N	L	H	L	N	M	M
Vermin	N	N	N	N	N	M	N
Severe storms: hail, lightning	M	M	H	N	M	M	M
Drought and Food insecurity	M	M	H	M	M	M	H
Environmental degradation	H	H	H	H	H	H	H
Mines and unexploded ordinance	N	L	N	N	N	L	L
Cattle theft	L	L	L	L	L	L	L
Land Conflict	M	M	H	M	M	M	H
Key: High = H, Medium = M, Low = L, Blank = Not reported							

Flood risk

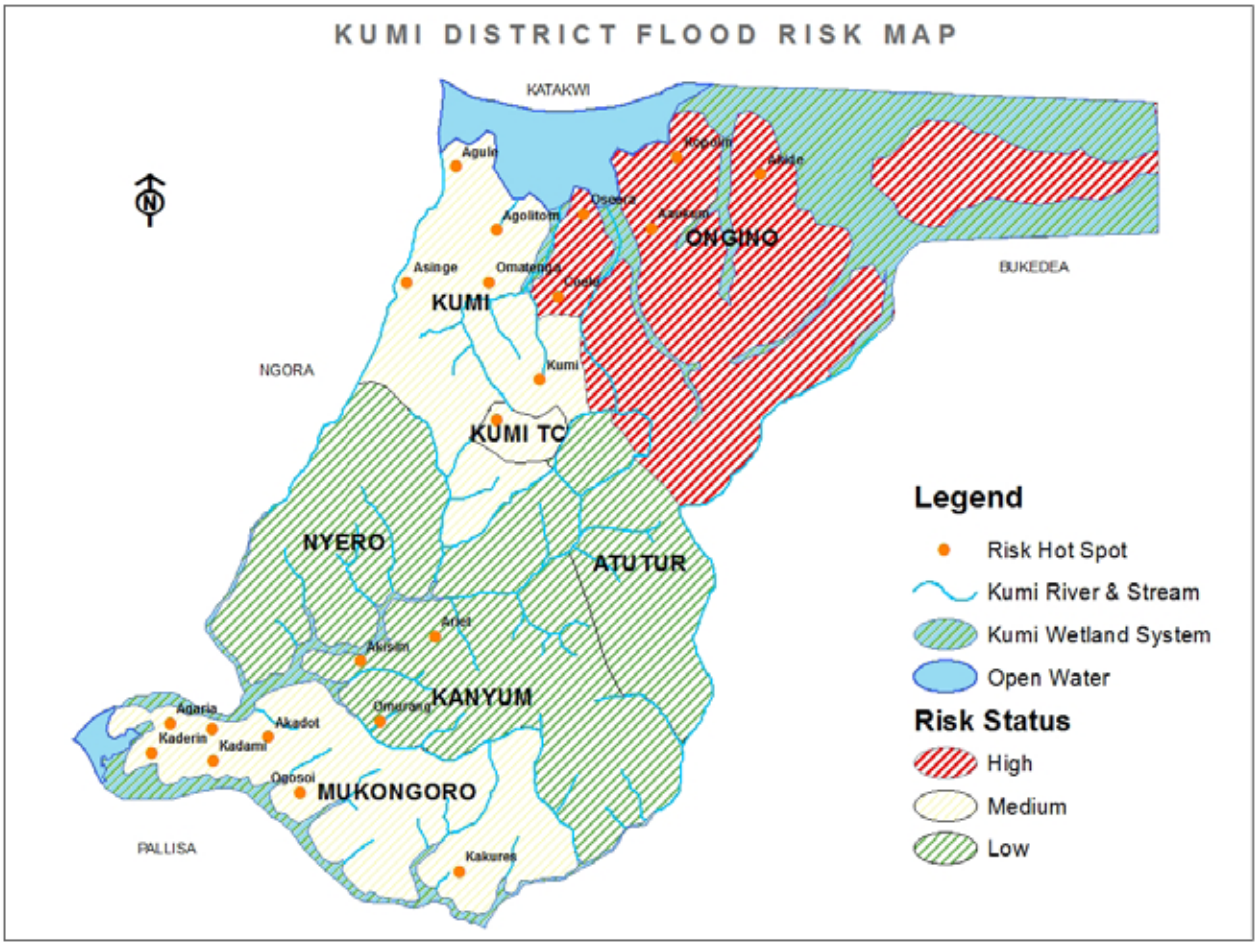

Figure 1 Flood risk map

Kumi is one of the lowest lying districts in the region, vulnerable to flooding with the most severe cases reported in Ongino Sub-County. Risk hot spots are cited in Ocere, Kopolin, Aaukum and Oseera parishes.

Flooding is moderately ranked in the district with some sub-counties not reporting significant floods. Flooding is mainly due to the heavy rains in the wet season and the many streams flowing across the district between the open waters and wetlands.

Nyero, Atutur and Kanyum sub-counties reported the lowest risk levels in the district while Kumi, Kumi Town Council and Mukongoro reported moderate (medium) risk levels.

Severe storms risk

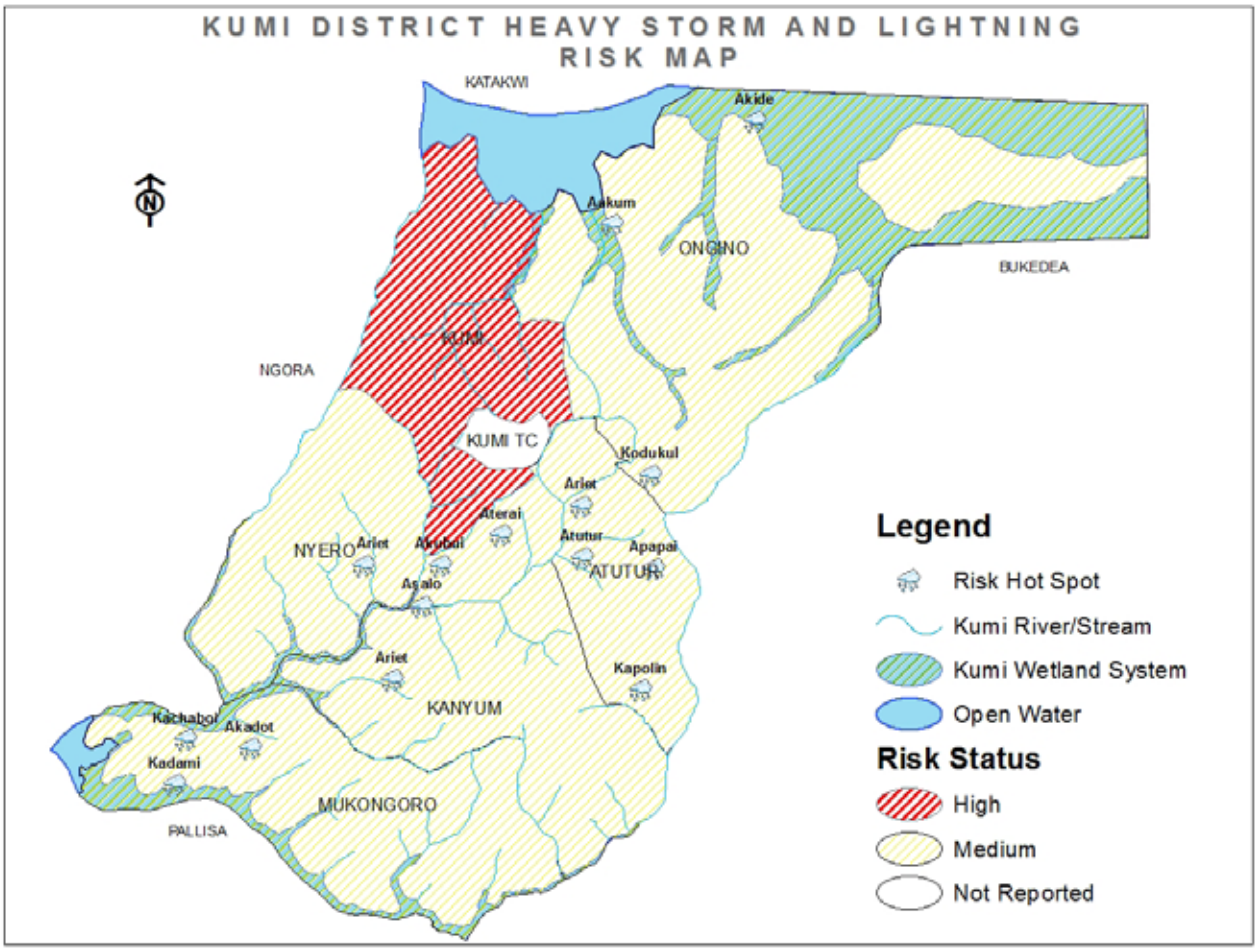

Figure 2 Severe storms risk map

Kumi District like any other in Teso sub-region experiences heavy rains especially during the wet seasons, sometimes with severe storms and lightning that devastate property and farmlands. Apart from Kumi Sub-county that recorded the high risk levels in the district, most of the sub-counties reported moderate risk levels, and others like Kumi Town Council reported no severe cases.

Drought and food insecurity

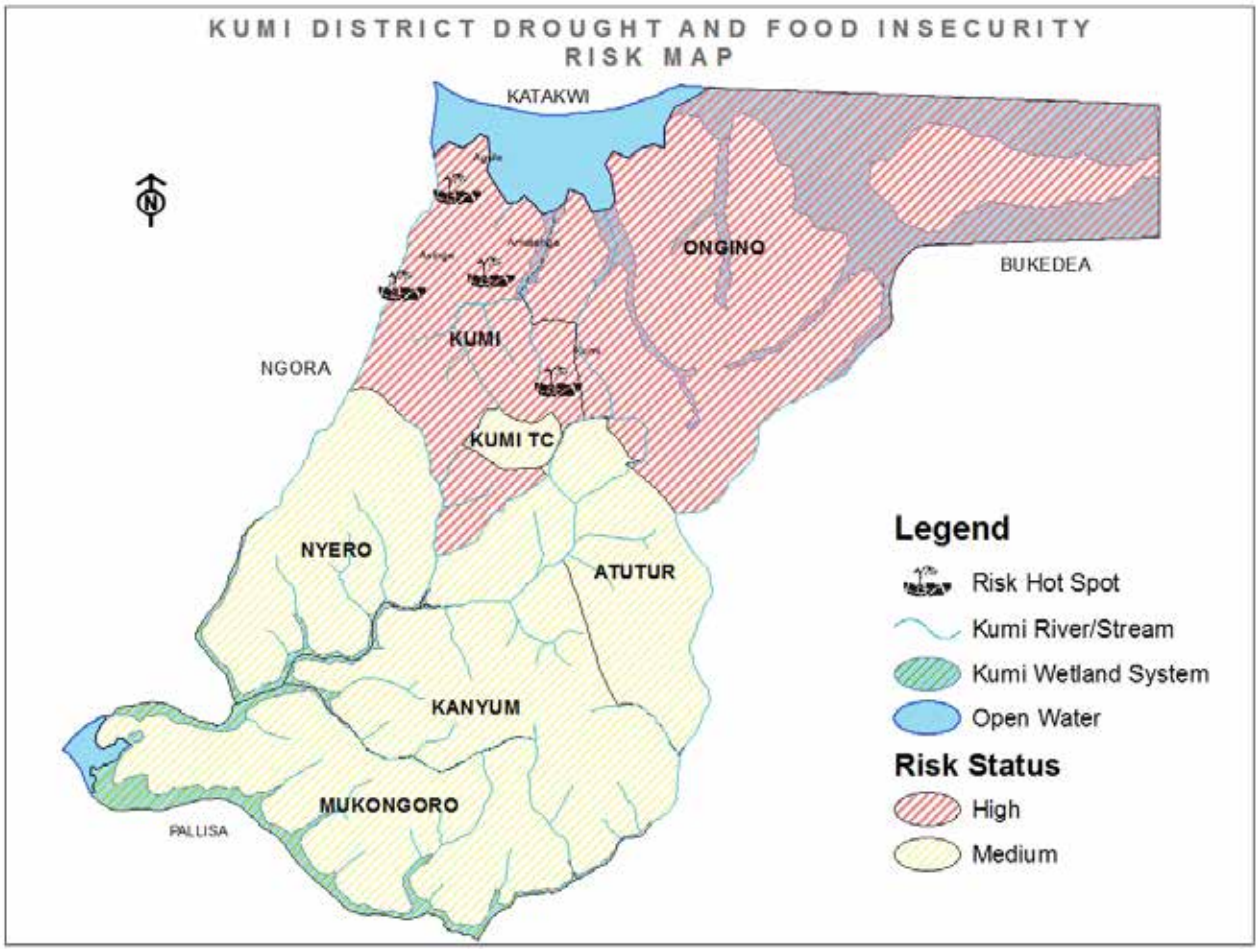

Figure 3 Drought and food insecurity risk map

In the recent past the District has experienced prolonged dry spells resulting in food shortages in some places, particularly in sub-counties located in the rain shadow belt of the district (Ongino and Kumi).

The other sub-counties experienced mild drought, without severe food shortages. Risk hot spots are cited in Agule, Asinge, Amatenga and Kumi parishes in Kumi Sub-county.

Environmental degradation risk

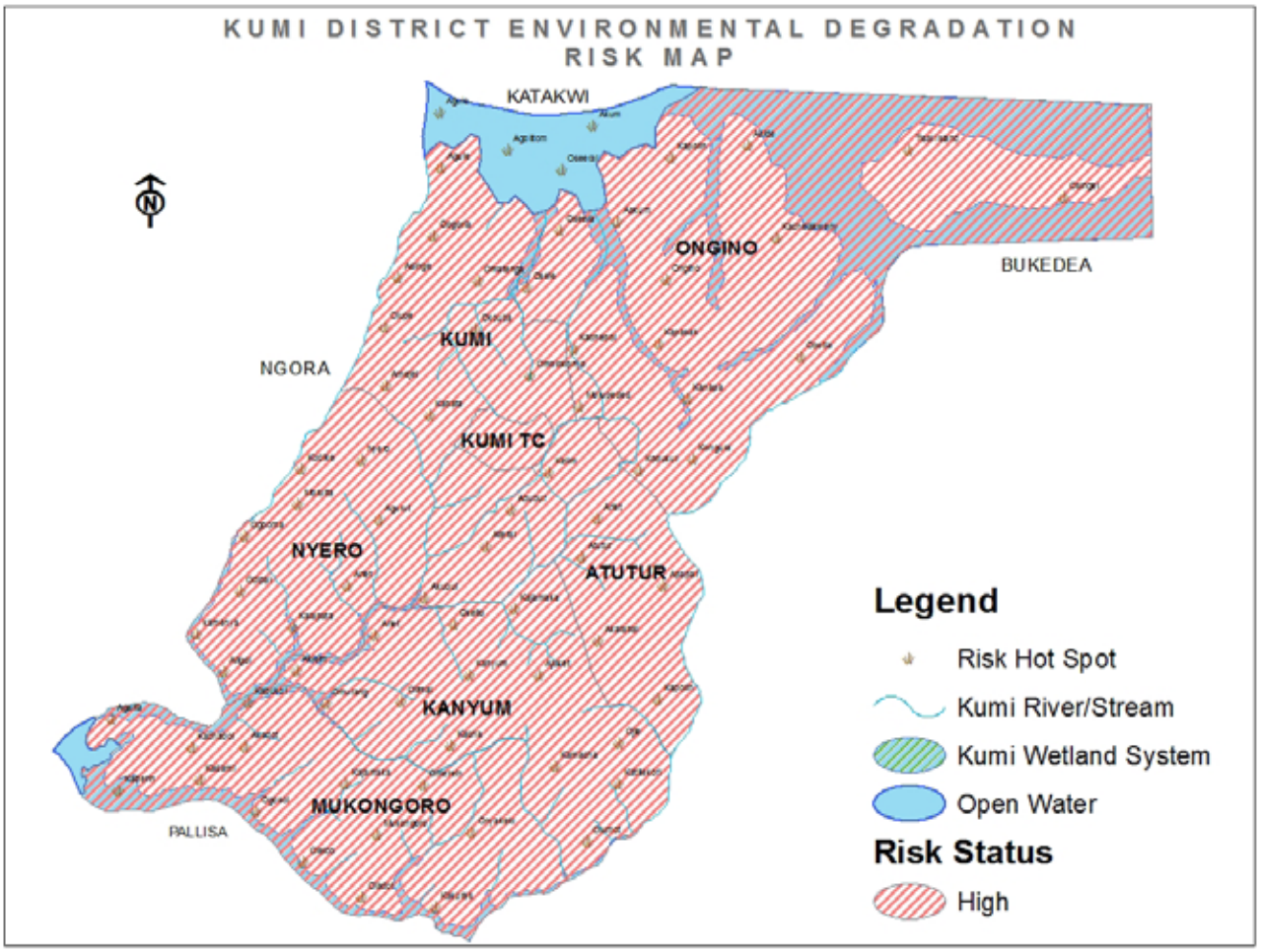

Figure 4 Environmental degradation risk map

The entire district continues to experience high risk levels of environmental degradation. Serious ecological damage in the district is manifested in severe sheet erosion, deforestation, vegetation burning, biodiversity loss, gulley development and flash floods in the entire district.

Land conflicts risk

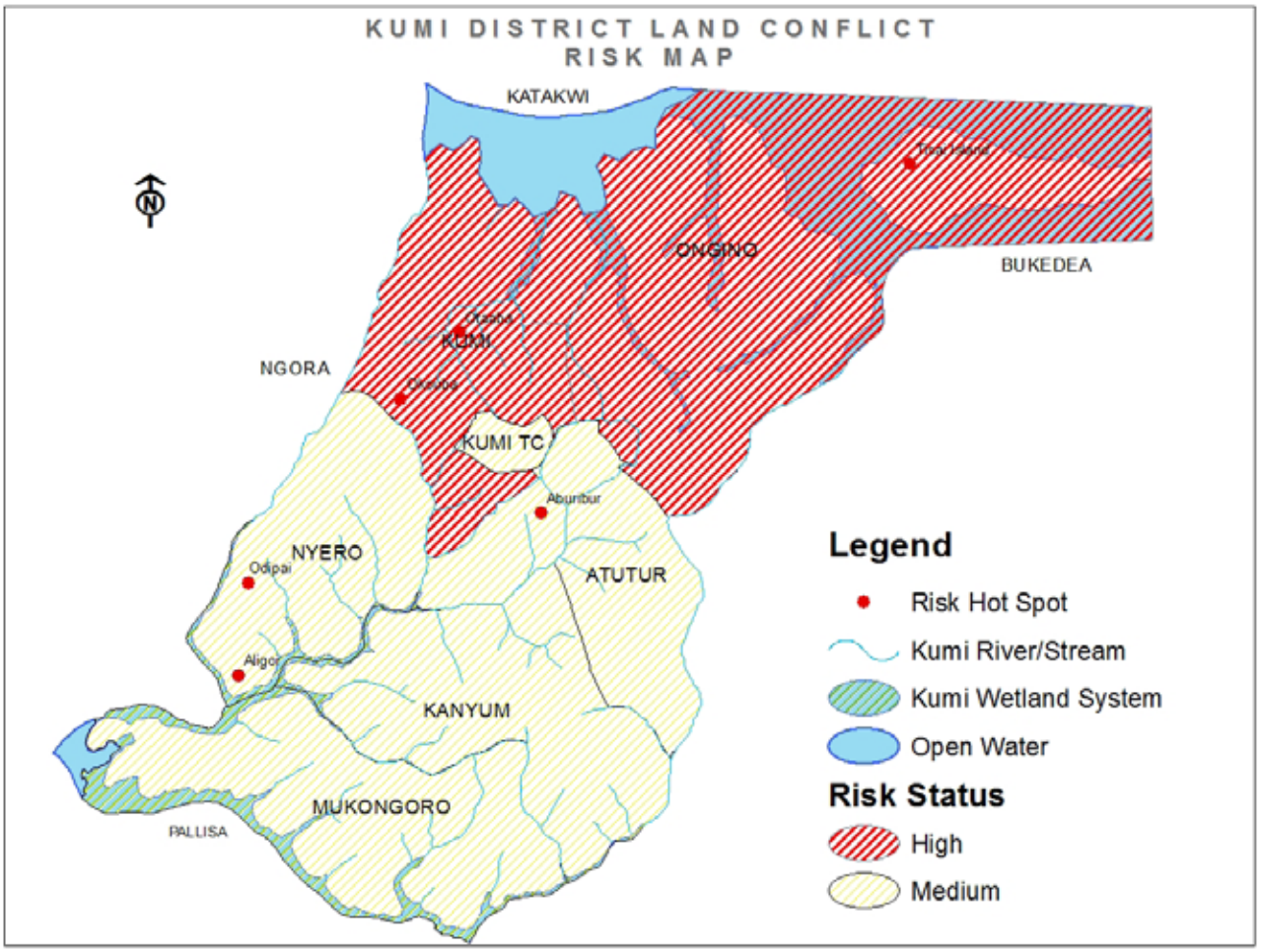

Figure 5 Land conflicts risk map

Incidence of land disputes and conflicts is increasing throughout the district. Cases of encroachment into institutional and government land have become common. Many Lower Local Governments in the district have been taken to courts of law because communities are reclaiming land that was given to government by their ancestors.

Institutions such as schools and churches have land boundary cases with communities living adjacent to them. Sub-counties that are seriously affected by land conflicts are Ongino and Kumi while the rest of the sub-counties experience moderate risk levels.

Crop and animal disease risk

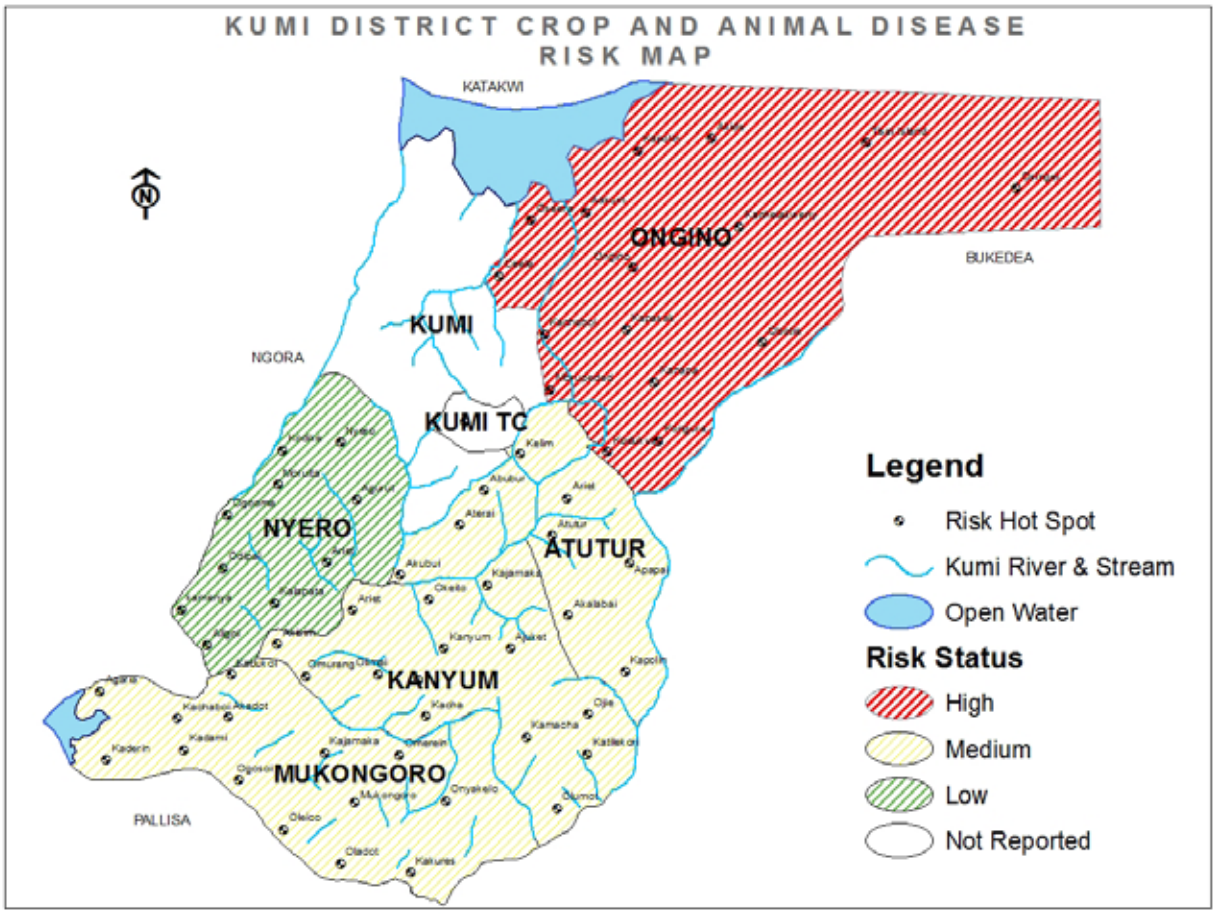

Figure 6 Crop and animal disease risk map

High risk levels of crop and animal disease are reported mainly in Ongino Sub-county. Moderate cases are reported in Atutur, Kanyum and Mukongoro sub-counties while Kumi Town Council and Kumi Sub-County, and Nyero report no and low risk levels, respectively.

Diseases most affecting livestock production continue to be foot and mouth disease, contagious bovine pleuro-pneumonia (CBPP), rabies, and tick-borne diseases, newcastle disease, trypanosomiasis and gumboo disease.

Pest infestation risk

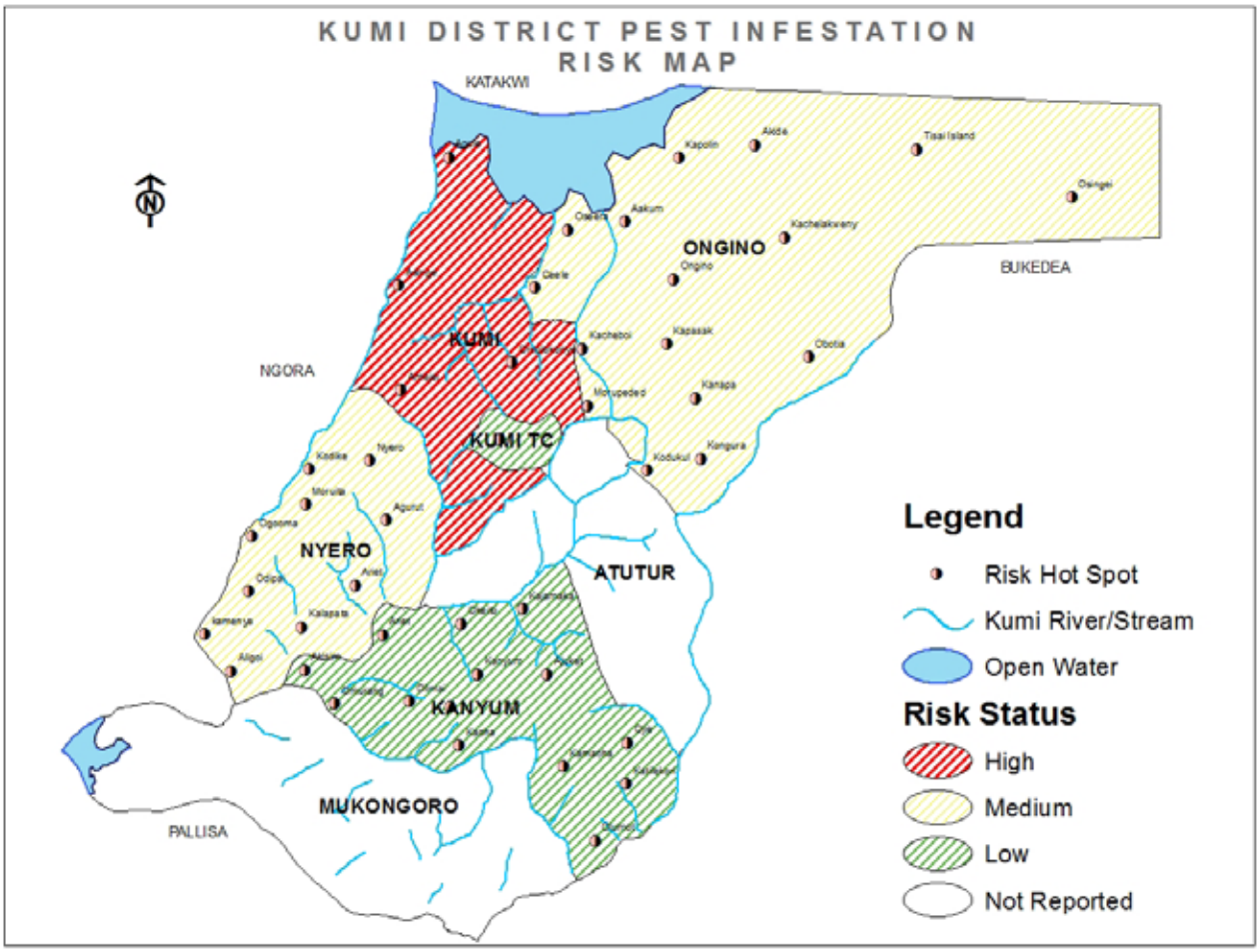

Figure 7 Pest infestation risk map

Pests are most problematic in crops and livestock in Nyero Sub-county. Apart from Mukongoro and Atutur sub-counties which reported no cases of pest infestation, the rest of the sub-counties reported either low or medium risk levels.

The major pests that affect crop yields include aphids on legumes and fruit trees, leaf minor on groundnuts, and stalk bores on cereals. The major animal pests affecting the livestock production continue to be worms, lice, flee ticks and tsetse flies.

Vermin risk

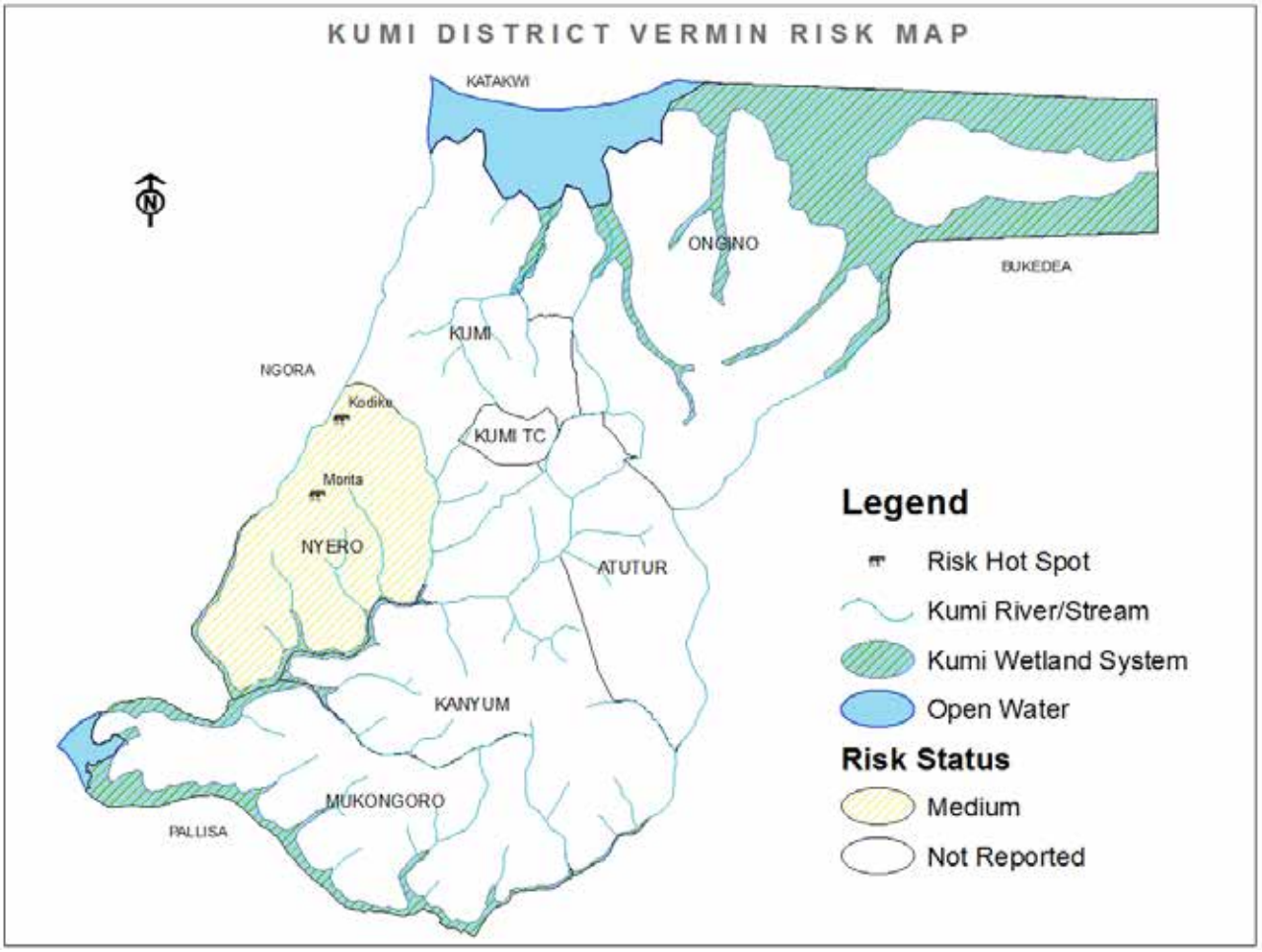

Figure 8 Vermin risk map

Baboons, monkeys, wild pigs and cane rats feed on crops during the flowering and harvesting season. Instances of crop raiding are common in Nyero Sub-County and specifically in Kodike and Morita parishes. The rest of the sub-counties in the district report no cases of vermin.

Unexploded ordinance risk

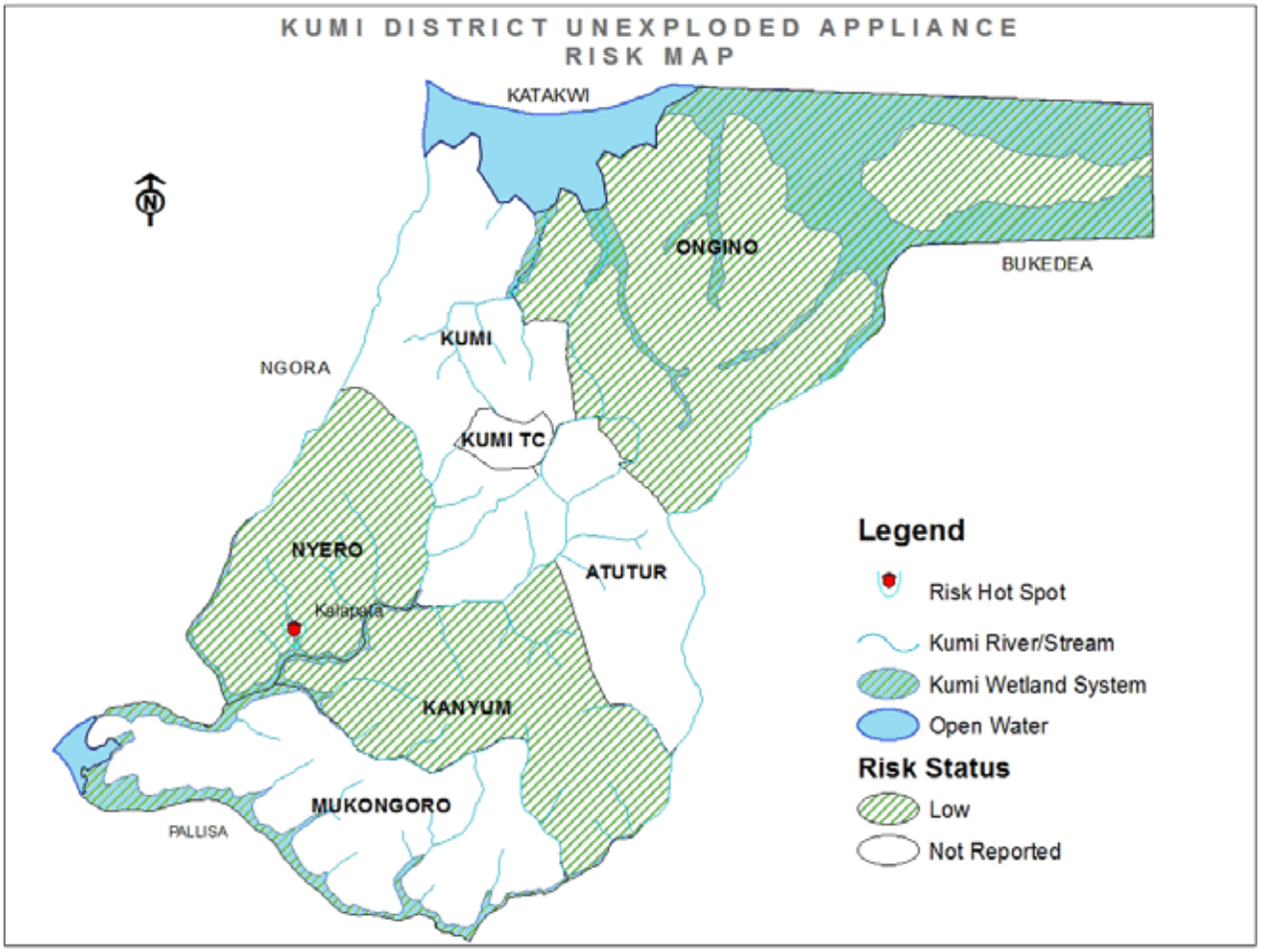

Figure 9 Unexploded ordinance risk map

Unexploded ordinance (e.g. abandoned guns and bullets) has been found in former battle grounds such as Kawabata and Akisim swamp, left by Lakwena and UPA hostilities. The other sub-counties reported no risks.

VULNERABILITY

Table 11 Risk vulnerability

Hazard	Atutur	Kanyum	Kumi	Kumi TC	Mukongoro	Nyero	Ongino
Floods	1	1	2	1	2	1	3
Crop and animal diseases	2	2			2		3
Pest infestations			3	1		2	2
Vermin						2	
Severe storms: hail, lightning	2	2	3		2	2	2
Drought and Food insecurity	2	2	3	2	2	2	3
Environmental degradation	3	3	3	3	3	3	3
Mines and unexploded ordinance		1				1	1
Cattle theft	1	1	1	1	1	1	1
Land conflict	2	2	3	2	2	2	3
Score: High = 3, Medium = 2, Low = 1, Blank = Not reported							

Risk vulnerability

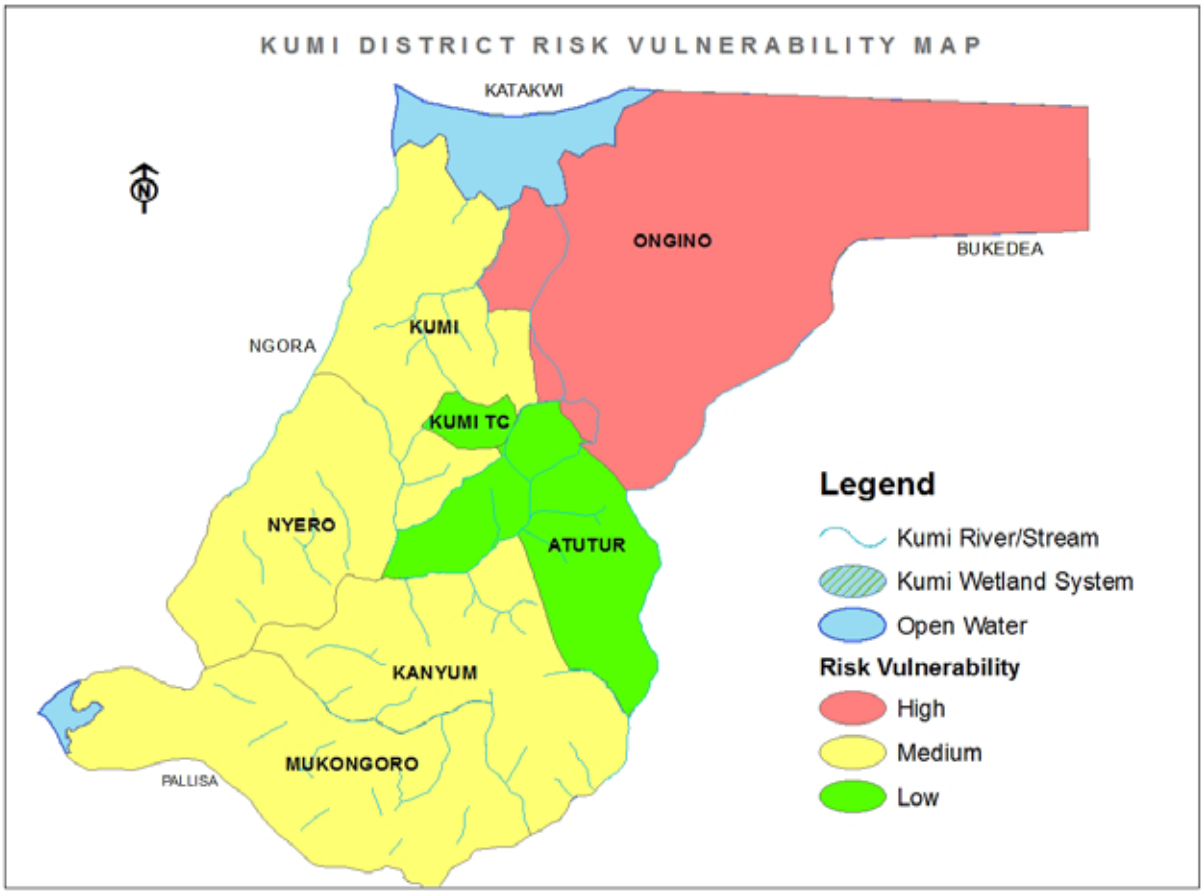

Figure 10 Kumi district vulnerability risk map

Table 11 estimates the relative vulnerability of communities in the sub-counties with respect to the hazards endemic there. The incidence of hazards across the district is not homogeneous, and consequently aggregate vulnerability conditions in Kumi District vary from one sub-county to another, as is evident in Figure 10.

Based on the frequency of hazard events and the magnitude of loss suffered, the sub-county with highest risk vulnerability is Ongino. The major hazards that have affected the sub-counties are environmental degradation, drought and food insecurity, land conflict, severe storms: hail, lightning and floods.

The low vulnerability risk areas are Kumi Town Council and Atutur Sub-County. Although these sub-counties had a low rating of risk vulnerability, environmental degradation cases is significant there.

Most of the sub-counties recorded moderate risk levels: Mukongoro, Kumi, Kanyum and Nyero Sub-County, coded yellow. Hazards in these areas had a relatively small impact and frequency of occurrence in the communities.

The multi-hazard vulnerability profile resulting from this mapping exercise is a combination of physical data and information captured with participatory methods from the community in Kumi District. It shows how communities in each sub-county perceive endemic hazards, by likelihood of occurrence and severity of impact.

CONCLUSIONS

The Kumi profile ranks ten hazards endemic in the district in order of highest risk: environmental degradation, drought and food insecurity, land conflict, severe storms (hail, lightning, floods), crop and animal diseases, pest infestations, cattle theft, mines and unexploded ordinance, and vermin.

The communities perceive themselves to be highly vulnerable to environmental degradation in all sub-counties. Although flooding in Kumi District has not had as severe an impact as in some other districts, it is still problematic in Kumi, Mukongoro and Ongino sub-counties. Kumi sub-county suffers from high vulnerability to pest infestation, storms and food insecurity; the communities in the remaining sub-counties judge themselves to be of medium vulnerability to these hazards. Land conflict has medium impact in all sub-counties.

Kumi and Ongino sub-counties register high vulnerability in four of the ten hazards, making them particularly prone to disasters of aggregated hazards.

The mapping exercise builds on spatial information related to hazards in Kumi District. The analysis should be incorporated in disaster mitigation plans developed by the Kumi District local government to guide actions that minimize the impacts of hazards.

DEFINITIONS 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, naganan, and bird flu. Crop disease epidemics include coffee wilt, banana bacterial wilt, cassava mosaic and cassava brown streak disease.

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

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

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

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

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

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

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

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

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

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

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