THE REPUBLIC OF UGANDA

FOR GOD AND MY COUNTRY

UNDP

Empowered lives.
Resilient nations.

KARAMOJA
NAPAK District

HAZARD, RISK AND VULNERABILITY PROFILE

August 2014

With support from:

United Nations Development Programme
Plot 11, Yusuf Lule Road
P.O. Box 7184
Kampala, Uganda
For more information: www.undp.org

Empowered lives.
Resilient nations.

Contents

Acronyms iv

Acknowledgement 1

EXECUTIVE SUMMARY 2

INTRODUCTION 3

Objectives 3

Methodology 3

Overview of the District 6

Location 6

Historical Background and Administrative Arrangement 6

Vision 6

Mission statement 6

Institutional set up 6

Land use 7

Climate, Rainfall and Temperature 7

Relief and Vegetation 8

Demographic Characteristics 8

Population Projections 8

Ethnic Groupings 9

Communication, Settlement and Housing 9

Livelihoods 10

HAZARDS 11

Hazard summary 11

Risk Assessment 14

RISKS 15

Flood Risk 15

Human Disease Risk 16

Drought Risk 17

Land Conflict Risk 18

Lightning and Hailstorm Risk 19

Bushfire Risk 20

Pest and Parasitic Infestation Risk 21

Cattle Theft Risk 22

Environmental Degradation Risk 23

Crop and Animal Risk 24

Vermin Risk 25

Strong Winds Risk 26

VULNERABILITY 27

Risk Vulnerability Map 28

CONCLUSIONS 30

DEFINITION OF TERMS 31

Maps

Figure 1 Flood risk 7

Figure 2 Human disease risk 8

Figure 3 Drought risk 9

Figure 4 Land conflict risk 10

Figure 5 Lightning and hailstorm risk 11

Figure 6 Fire risk 12

Figure 7 Pest and parasitic infestation risk 13

Figure 8 Cattle theft risk 14

Figure 9 Environmental degradation Risk 15

Figure 10 Crop and animal diseases risk 16

Figure 11 Vermin risk 17

Figure 12 Strong wind risk 18

Figure 13 Risk vulnerability map 20

Tables

Table 1 Population Projections 5

Table 2 Livelihoods 2

Table 3 Hazard summary 2

Table 4 Summary of Hazards 2

Table 5 Risk assessment 6

Table 6 Vulnerability assessment 19

Acronyms

CAO	Chief Administrative Officer
DDMC	District Disaster Management Committee
DRM	Disaster Risk Management
DSC	District Service Commission
GIS	Geographic Information System
GOU	The Government of Uganda
GPS	Global Positioning System
GR	game reserve
LC	local council
NGO	Non-Government Organization
OPM	The Office of the Prime Minister
PDU	Procurement and Disposal Unit
SC	sub-county
TC	town council
UBOS	Uganda Bureau of Statistics
UNDP	United Nations Development Programme
UWA	Uganda Wildlife Authority

Acknowledgement

On behalf of the Office of the Prime Minister, I wish to express sincere gratitude to all of the key stakeholders who provided their valuable inputs and support to this hazard, risk and vulnerability mapping exercise that led to the production of comprehensive district hazard, risk and vulnerability profiles for the Karamoja sub-region.

I especially extend my appreciation to the Department of Disaster Preparedness and Management in the Office of the Prime Minister, under the leadership of the Acting Commissioner, Ms. Rose Nakabugo and the Assistant Commissioner, Mr. Gerald Menyha, for the oversight and management of the entire exercise. My appreciation also goes to the District Disaster Management Committees and the entire body of stakeholders who in one way or another yielded valuable ideas, resources and time to support the completion of this exercise.

Our gratitude goes also to the UNDP for providing funds to support this initiative and to the UNDP/OPM Team comprised of Mr. Jose Neil A. C. Manzano, Disaster Risk Management Advisor; Mr. Gilbert Anguyo, Disaster Risk Reduction Analyst; and Mr. Sidney Tupper, Climate Risk Management Specialist, for providing valuable technical support in the organization of the exercise, review of maps and findings, and editing of the profiles.

Finally, the field team led by Mr. Solomon Elungat, Senior Disaster Management Officer and supported by Mr. Moses Banduga, GIS Expert, Mr. Samuel Lwetutte, Ms. Pamella Drate, GIS Specialists and the entire district technical team who painstakingly traversed the sub-region gathering local knowledge, mapping hazards and compiling these documents, deserves our thanks.

Hon. Hilary O. Onek

Minister for Relief, Disaster Preparedness and Management

EXECUTIVE SUMMARY

This Napak 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.

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, gender demographics by sub-county and livelihoods.

Napak District is located in mid-north-eastern Uganda, between latitudes 1˚53'N, 3˚05'N and longitudes 33˚38'E, 34˚56'E. It shares borders with 5 districts: Kotido to the north, Otukei and Abim northwest, Katakwi to the west, Moroto to the east and Nakapiripirit to the south.

The profile identifies 12 hazards: human diseases, drought, bushfires, environmental degradation, crop and animal disease, flood, land conflict, strong wind, pest infestation, lightning, vermin and cattle theft predominate in the district, in order of decreasing risk.

Human diseases, drought, bushfires and environmental degradation ranked closely as the most dangerous and high-risk hazards for people in Napak District.

The Napak sub-counties have low to medium vulnerability to disaster, accumulating risk from several hazards. The northern sub-counties of Ngoleriet, Lokopo, Lotome, Lopeei and Matany record low aggregate vulnerability levels, and Iriri, Lorengecora and Lorengecora Town Council have medium aggregate vulnerability. Lorengecora and Lorengecora Town Council have high risk of human disease due to poor sanitation facilities, and Lorengecora suffers from severe deforestation. This aggregated vulnerability to several hazards at once compounds the exposure to disaster risk and the complexity of managing it.

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.

INTRODUCTION

The Napak 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 Napak district. The information contained in this District Hazard, Risk, and Vulnerability Profile will guide the adoption of disaster risk management (DRM) measures in the district and inform the development of the district's contingency and development plans.

Objectives

The objective of the hazard, risk, and vulnerability mapping is to produce a District Profile that will aid planning and decision making processes in addressing disaster threats/risks in Napak District.

Methodology

The multi-hazard, risk and vulnerability mapping approach employed a people-centred, 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 Karamoja 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 Karamoja sub-regions studied) 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-mapable 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: Dissemination Workshop

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

Overview of the District

Location

Napak District is situated in mid-north-eastern Uganda. It lies between latitudes 1˚ 53'N, 3˚ 05'N and longitudes 33˚ 38'E, 34˚ 56'E. It shares borders with five districts: Kotido to the north, Otukei and Abim to the northwest, Katakwi to the west, Moroto to the east and Nakapiripirit to the south. Napak's elevation ranges between 1,356 – 1,524m above sea level. The district has a total land area of 8,516km squared which is 3.5% of the country's area coverage.

Historical Background and Administrative Arrangement

Napak was curved from Moroto District from 1st July 2010 with its headquarters located in Lorengecora Sub-County. The district has seven sub counties and one Town council.

Vision

Peaceful, dignified and prosperous people of Napak district within 25 years.

Mission statement

To ensure efficient and effective service delivery that enhances social economic and political empowerment of the people in conformity with national and local priorities.

Institutional set up

The district has political and administrative structures down to the village level. The political structures are Local Councils: Local Council V at district level to Local Council I at village level. LC V, LC III, and LC I are key decision making councils. The other two Local Councils, LC IV and LC II, are administrative unit councils.

The LC V and LC III are independent local governments. The district council is the policy-making body of the district. All councils are policy-making bodies and monitor the developmental programs in the district. The District Chairperson, who is also the District Political Head, heads

the local council at district level. He is responsible to the electorate through an elected district council. He is assisted in his day-to-day work by a Cabinet (Secretaries) selected from among the councilors by himself and approved by the District Council. The Chairperson is supported by a technical team led by the Chief Administrative Officer (CAO) who is the Accounting Officer, heads all the civil servants and co-ordinates all the activities in the district, assisted by the various Heads of Directorates.

The current District Council is made up of 17 councilors (Eight men and nine women). The Council has established the Public Accounts Committee, the District Service Committee, the District Land Board, the District procurement Committee and the District Land Board as independent organs of the administration to ensure transparent, efficient and smooth management of the District affairs. Working hand in hand with the District Council and administration is the Resident District Commissioner, appointed by the President who is responsible for security matters and ensuring overall accountability for government programs.

The District is operating with the following departments;

- Administration and Management
- Finance
- Statutory Bodies (Council, PDU, DSC, Land Board)
- Production
- Health
- Education
- Works and Technical Services
- Natural Resources
- Community Based Services
- Planning Unit
- Internal Audit

Administratively, the district has its headquarters in Matany Town Board. It has 256 LC I villages in 34 parishes distributed in 7 Sub-counties/Divisions in one county, of Bokora, and Lorengecora Town council. In the sub-county (Lower Local Governments) the Sub-County Administrative Officer is the head of the public servants and the Chairman Sub-County Council is the political head.

Land use

The district covers an area of 4,978 km^2. Approximately 2,046 km^2 is available for cultivation excluding game reserves and parks (2,864 km^2) and mountains (58 km^2). The population density on this arable land is 22.3 persons per km^2.

Climate, Rainfall and Temperature

The climate in Napak is semi-arid characterized by an intense hot season lasting from November to March. The wet season is from April to August with marked minima in June and marked maxima in May and July. Rainfall is in the range of 300 to 1200mm per year with a mean annual rainfall of 800mm.

The mean daily maximum temperature ranges from ($28^{\circ}c$ – $33^{\circ}c$) during the dry season. Generally, the hottest months are January and February when the average daily maximum temperature may

reach 33.5°c; in October – December average daily maximum temperature is 29.5°c. Mean daily minimum temperature ranges from 15– 17°c.

Available records indicate an average relative humidity of 63% during morning hours and 46% during the afternoon. As expected, lowest relative humidity values are experienced during the months of drought; higher values are recorded in the morning hours.

Relief and Vegetation

The vegetation pattern in Napak district is typically semiarid with dry savannah tree species and predominantly grass species. The main vegetation communities in the district include forests at high altitudes (dry montane forests), savannah woodland, semi evergreen thickets, deciduous thickets, riparian communities, and grass steppe communities. Forests are localized groves on hills and mountains such as Kamalinga Forest on Mt Napak. Forest cover is estimated at 100 km^2.

Demographic Characteristics

The Population and Housing Censuses of 1980, 1991 and 2002 put the population of Napak district at 95,863, 96,833 and 112,697 persons constituting 0.76%, 0.58% and 0.78 % of the total country population respectively. The 96% increase in population from 96,833 in 1991 to 112,697 in 2002 has been attributed to the high growth rate of 5.8% as compared to the country's growth rate of 3.2%. The gender ratio was 93 males per 100 females according to the 2002 census implying that the number of females has continued to outnumber that of males. The projected population for 2011 was 187,000, of which 93,000 were male and 94,000 were female. [Source: UBOS]

The district has the nation's lowest population density of 22.3 persons per km^2, compared to the highest of 7,259 persons per km^2 for Kampala District. Out of the total population, only 4% live in urban areas.

Population Projections

Basing on the high growth rate of 5.8% per annum, the population of Napak district was expected to grow as follows for the years 2003 to 2010:

Table 1 Population Projections

Sub-county	2008	2009	2010	2011	2012
Iriiri	25,319	27,007	28,400	30,100	31,800
Lorengecora	8,100	8,400	9,000	9,500	10100
Lokopo	21,971	23,277	24,662	26,200	27,600
Lopeei	20,141	21,339	22,608	24,000	25,300
Lotome	32,323	34,246	36,283	38,300	40,500
Matany	28,544	30,242	32,041	33,900	36,000
Ngoleriet	21,119	22,376	23,706	25,000	26,400
Total	157517	166887	176813	187000	197700

Source: District Planning Unit, UBOS

Ethnic Groupings

The inhabitants are of two major tribes. The Karimojong are the main inhabitants of the rangelands, and the Tepeth live on the mountains of Napak. While these people have differences in language and culture, they share similar socio-economic conditions. They are agro-pastoralist, practicing subsistence crop production and semi-nomadic livestock rearing. Due to migrations over the years diverse tribes from all parts of the county reside in urban areas such as trading centers and town boards, including Iteso, Luo, Buganda, Bagishu, Somalis and some people of European and Asian origin.

Communication, Settlement and Housing

The road network is 254 km in total length, all murram. The district lacks all-weather roads; most are virtually seasonal. The core network of 67.4 km motorable roads, adequate for security and emergency use, has segments Okoboi-Apeitolim-Iriiri, Lothaa-Olilim, Lokichar-Turtuko- Kapelebyong and Napak-Turtuko - Nyakwae. The district has five major bridges and numerous culverts.

There is one airstrip in the district situated in Matany Sub-County by the mission hospital. The main modes of household transport are walking and cycling. Napak district has no Post Office. It has three telecommunication providers: Mobile Telephone Network – MTN, Celtel Uganda (now Airtel) and Uganda Telecom Ltd. commonly known as mango. There are no radio stations yet in the district. About 85% of the households use “word of mouth” as their main source of information.

Settlement in the district is sparse with concentrations around productive agricultural areas, trading centres and near rivers and springs. The population density is 22 persons/km^2 (17 persons/km^2 in 1991). For security reasons, people live in clusters of households called manyattas. A typical manyatta has outer and inner fences of thorns. Most rural dwellings in Napak have mud and wattle walls, rammed earth floor and grass thatched roof. To enter, an adult has to kneel and once inside, may not be able to stand erect. This is for security reasons and privacy.

Livelihoods

Table 2 Livelihoods summary

Agro-ecological zone	Livelihoods	Sub-County
Highland zone	apiary agriculture/agroforestry animal rearing poultry rearing stone quarrying charcoal trade /fuel wood local brewing	Iriiri (Nabwal), Lorengecora SC (Cholichol).
Gently sloping zone	charcoal making agriculture animal rearing poultry rearing murram excavation charcoal trade /fuel wood local brewing	Lorengecora TC, Ngoleriet Lotome,
	cattle markets	Ngoleriet, Matany
	fuel wood saving stoves	Matany
Lowland zone	murram excavation	Lopeei
	animal rearing fishing local brewing firewood collection agriculture	Lokopo, Lopeei
	apiary	Lokopo
	gum Arabic	Lokopo, Lopeei

HAZARDS

Table 3 Hazard summary

Hazard	Status	Sub-county	Rank
Human disease	Incidence of hepatitis E and B reported across the district.	Ngoleriet Lokopo Lopeei Lotome Matany Iriiri Lorengecora SC Lorengecora TC	1
Drought	Incidence reported across the whole district. In 2014, 13 people died of hunger in Lokupoi parish of Matany.	Ngoleriet Lokopo Lopeei Lotome Iriiri Lorengecora TC Lorengecora Matany	2
Environmental degradation	Deforestation due to charcoal burning and selling of fire wood/charcoal to the nearby districts reported.	Ngoleriet Lokopo Lopeei Lotome Iriiri Matany Lorengecora SC Lorengecora TC	3
Bushfires	Incidence of bushfires reported. Homesteads in Nacuka, Kobulin, Narengemoru and lokeru were destroyed by fire in Iriiri Sub-County.	Ngoleriet Lokopo Lopeei Lotome Matany Iriiri Lorengecora SC Lorengecora TC	4
Crop and animal disease	Incidence of tick borne diseases in livestock and sorghum brown streak reported	Ngoleriet Lokopo Lopeei Lotome Iriiri Matany Lorengecora SC Lorengecora TC	5

Hazard	Status	Sub-county	Rank
Flood	Flood events reported, mostly Omaniman River overflows.	Ngoleriet Lokopo Lopeei Lotome Iriiri Matany Lorengecora SC	6
Land conflict	Instances of internal (neighbours) conflict and external (district trans-boundary) reported. External border conflicts are mainly with adjacent districts, e.g., Abim and institutions such as UWA.	Ngoleriet Lokopo Lotome Iriiri Lorengecora Lorengecora TC	7
Strong wind	In May, 2014 for example, 4 house roofs were blown off, in Lopei, Lokopo Sub-County. Loparipar community school roofs were blown off.	Ngoleriet Lokopo Lopeei Lotome Lorengecora SC	8
Lightning and hailstorms	Instances of destructive lightning and hail storms were reported. In 2013, lightning killed goats in Nakichumet. In Lokopo, Lorikitia village, a boy was struck and died.	Lokopo Iriiri Lorengecora SC Lorengecora TC	9
Pest infestation	Incidence of pest infestation reported.	Ngoleriet Lokopo Lopeei Matany Iriiri Lorengecora SC	10
Cattle theft	Incidence of cattle theft across the district reported.	Lokopo Lopeei Lotome Iriiri Lorengecora SC	11
Vermin	Incidence of garden invasions by wild pigs, monkeys and edible rats reported.	Matany Iriiri Lorengecora SC	12

Hazard summary

Table 2 indicates which hazards are found in the sub-counties, the ranking of sub-counties by number of hazards found in them and the number of sub-counties affected by each hazard.

Table 4 Summary of Hazards by Sub-county

Sub County	Floods	Crop & Animal Disease	Drought & Food Insecurity	Hailstorm/Lightening	Strong Winds	Land Conflicts	Wild Fires	Pest Infestation	Cattle Theft	Environmental Degradation	Vermin/Problem Animal	Human Disease	Total Vulnerability (only based on Hazard Presence and not frequency or magnitude of loss suffered
Ngoleriet	✓	✓	✓	0	✓	✓	✓	✓	0	✓	0	✓	09
Lokopo	✓	✓	✓	0	✓	✓	✓	✓	✓	✓	0	✓	11
Lopeei	✓	✓	✓	0	✓	0	✓	✓	✓	✓	0	✓	09
Lotome	✓	✓	✓	0	✓	✓	✓	0	✓	✓	0	✓	09
Iriiri	✓	✓	✓	✓	0	✓	✓	✓	✓	✓	✓	✓	11
Lorengecora	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
Lorengecora Town Council	0	✓	✓	✓	✓	✓	✓	0	0	✓	0	✓	08
Matany	✓	✓	✓	✓	0	0	✓	0	0	✓	✓	✓	08
Total	07	08	08	05	06	06	08	05	05	08	03	08	77

Risk Assessment

Table 5 records the consensus of communities on the severity and frequency of hazard instances in their sub-county or town council, expressed in subjective terms of low, medium and high. The blanks cells indicate that the hazard is not reported in that location.

Table 5 Risk Assessment

Hazard	Ngoleriet	Lokopo	Lotome	Lopeei	Lorengecora	Lorengecora TC	Iriiri	Matany
Flood	L	H	L	M	M	N	M	M
Crop, animal disease	L	M	L	M	M	M	M	M
Land conflicts	M	M	M	N	M	M	M	L
Drought	H	M	M	M	M	M	M	M
Hailstorm, light-ning	N	L	N	N	L	L	M	L
Strong wind	M	L	M	M	M	M	N	N
Bushfire	M	M	M	M	M	L	M	M
Pest infestation	M	M	N	M	L	N	M	N
Cattle theft	N	L	L	L	L	N	L	L
Environmental degradation	M	L	M	M	H	L	M	M
Vermin	N	L	N	N	M	L	H	N
Human disease	M	M	M	M	H	H	M	M

RISKS

Flood Risk

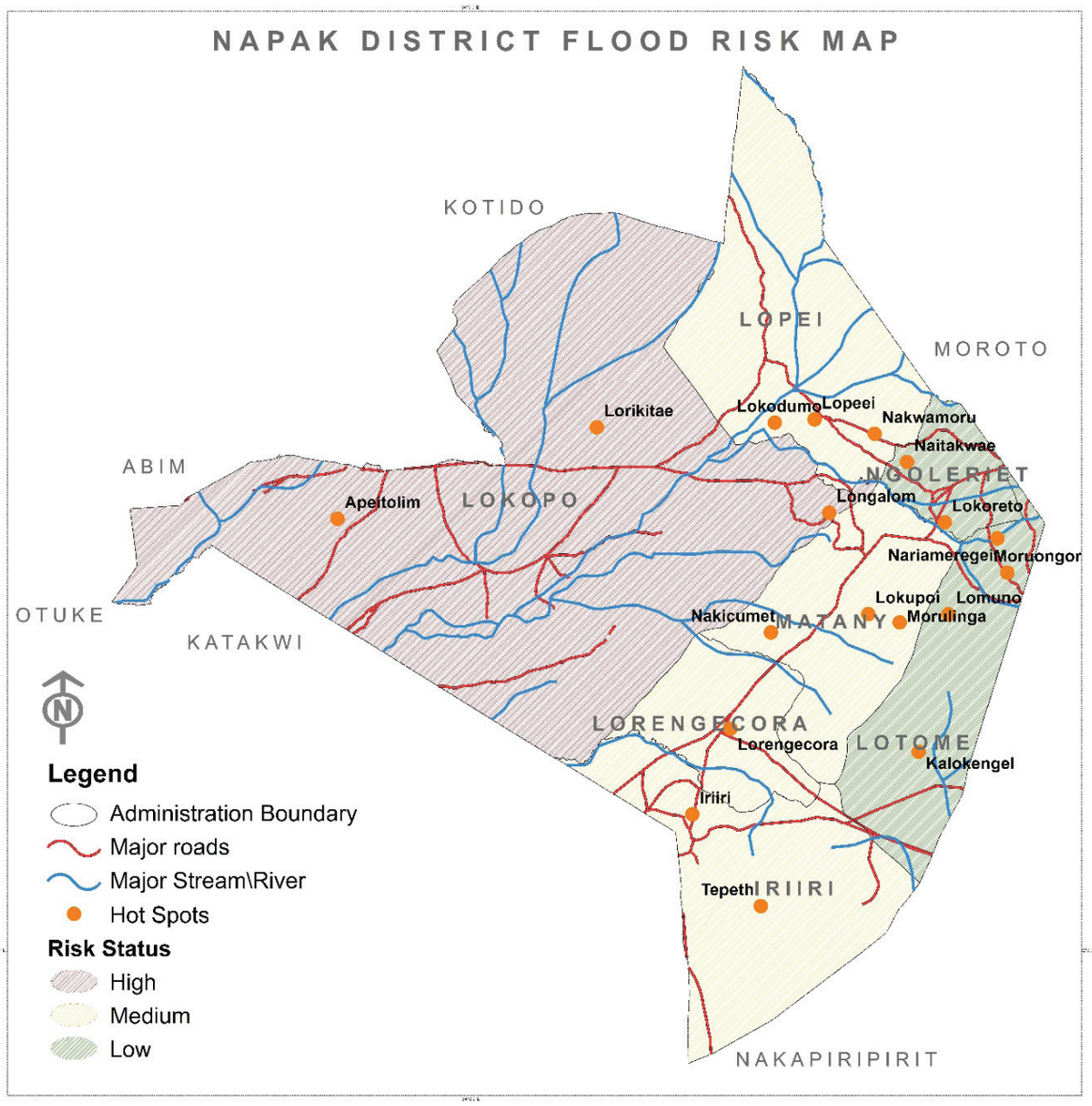

Figure 1 Flood risk

All the sub-counties in the district are reported to be affected by floods. Lokopo Sub-County (Apeitolim and Lorikitae) experience the highest risk levels, attributed to the flat terrain of the district and effects of Omaniman River from the Moroto and Napak hills. Floods destroy crops and block the road network, hampering service delivery. Floods usually make Soroti-Moroto and Lotome roads, and Kangole Bridge impassable. Risk hot spots are recorded in the parishes of Lokoreto and Naitakwae (Kaurikane, Toyep toto and Lomaratoit) in Iriri parish, as well as in Kobulin and Lokeru in Lorengecora. Villages in Moruougor, Nariamaregae and Kalokeyel East Parishes are also exposed to severe flooding. In Lotome children wade to school during the rainy seasons.

Human Disease Risk

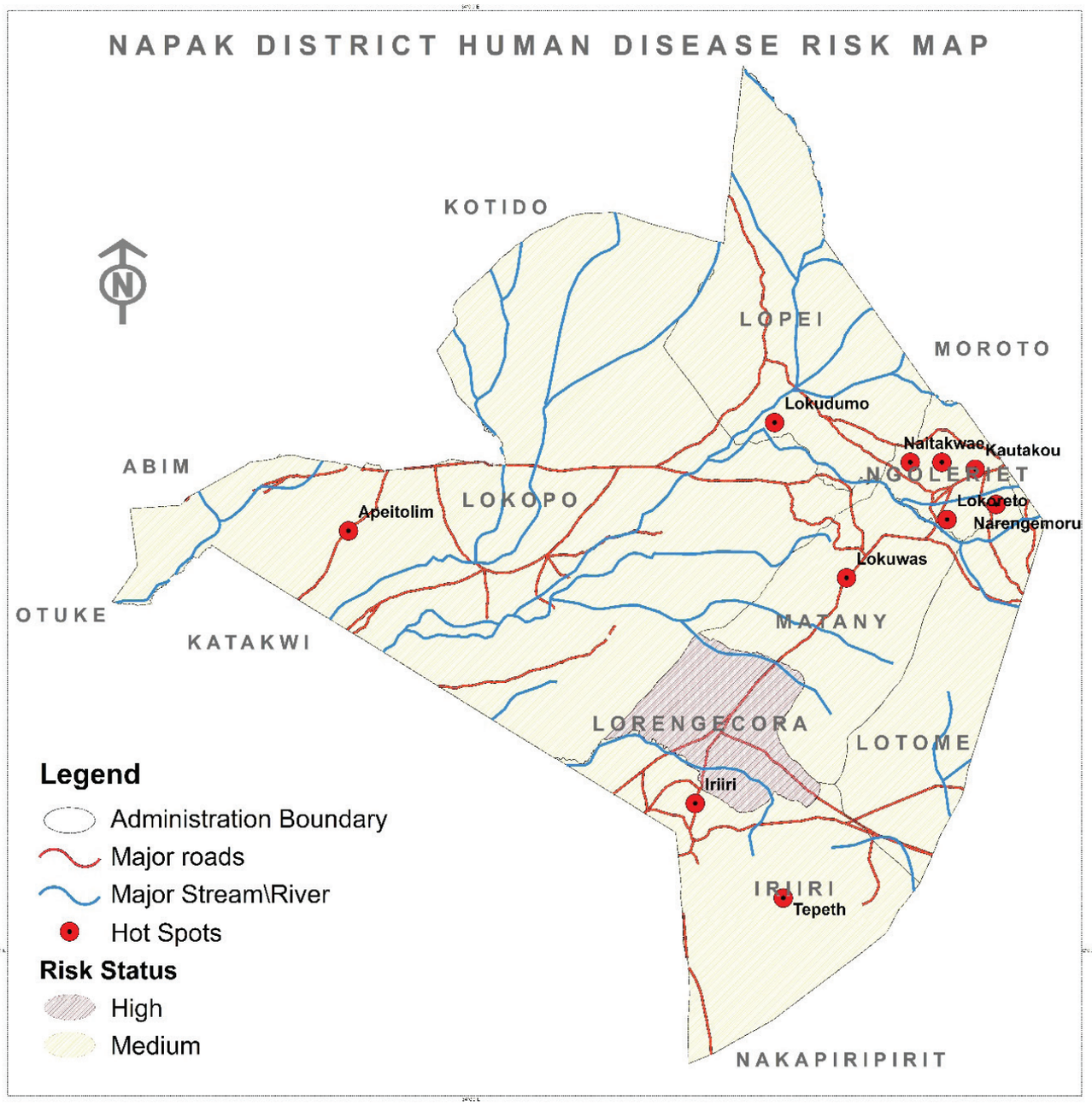

Figure 2 Human disease risk

All the sub-counties of Napak are affected by hepatitis E, attributed to poor sanitation and hygiene caused by the increasing population and migrations from the neighbouring districts. Lorengecora Town Council and Lorengecora Sub-County experience high risk levels closely followed by Matany and Iriir.

Hepatitis E prevalence is also due to the poor attitude of the community towards use of pit latrines. Cases were reported in Lokudumo Parish trading centre village, Apeitolim, and Namuget trading centre village. Lokopo Sub-County alone is reported to have registered 157 cases of hepatitis E in 2013.

Jiggers is reported to afflict people in Iriiri Sub-County in Amedek and Nagule-Angolol in Ngoleriet Sub-County.

Drought Risk

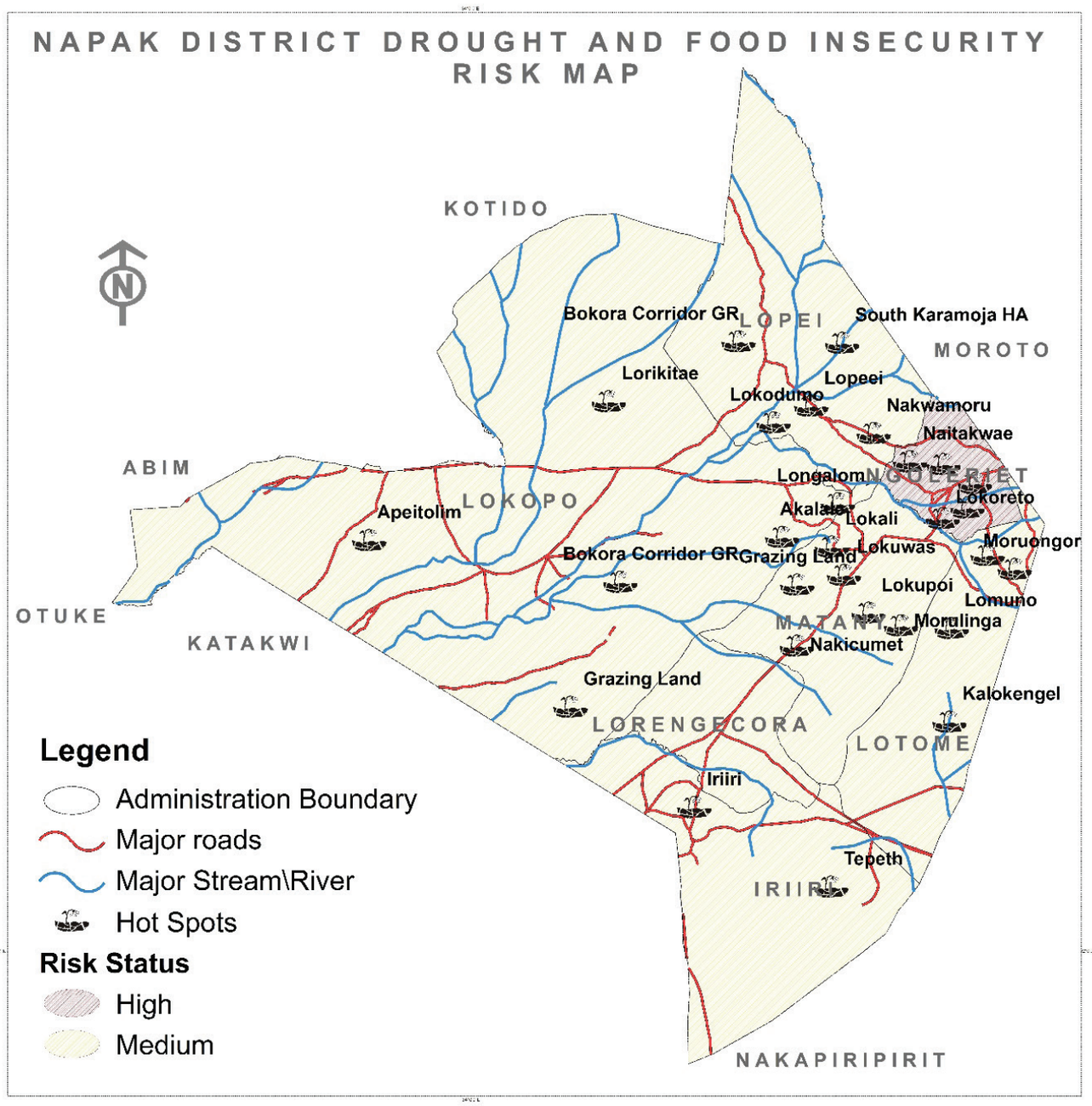

Figure 3 Drought

Due to climatic variations and consequent delays in cultivation, cases of food shortage are always reported. Ngoloriet Sub-County (Narengemoru, Naitakwae, Lokoreto parishes) reported cases of death more than other sub-counties in the district. Risk hot spots are recorded in Lopeei, Lokodumo, Bokora corridor Game Reserve, South Karamoja Hunting Area and Nakwamuro Parishes in Lopei Sub-County. Other hot spot parishes are in Iriiri and Tepeth (Iriiri Sub-County) and Lokupoi, Lokuwas, Lokali, Nakivhumet and Morulinga parishes in Matany Sub-County.

Land Conflict Risk

Figure 4 Land conflict risk

Land conflict related instances were reported in the whole district, attributed to population increase, greed, unclear boundaries, poverty and inadequate land titling processes. The conflicts occur between households, clans, institutions, sub-counties, communities, and between individuals. Serious border conflict between Loregocora Sub-county and Loregecora Town Council was reported. Others are mainly district border conflicts like the case of conflicts with the districts of Katakwi, Amuria and Abim. Conflicts in Abim occur over access to fertile soils in Apeitolim, Lokopo Sub-County.

Lightning and Hailstorm Risk

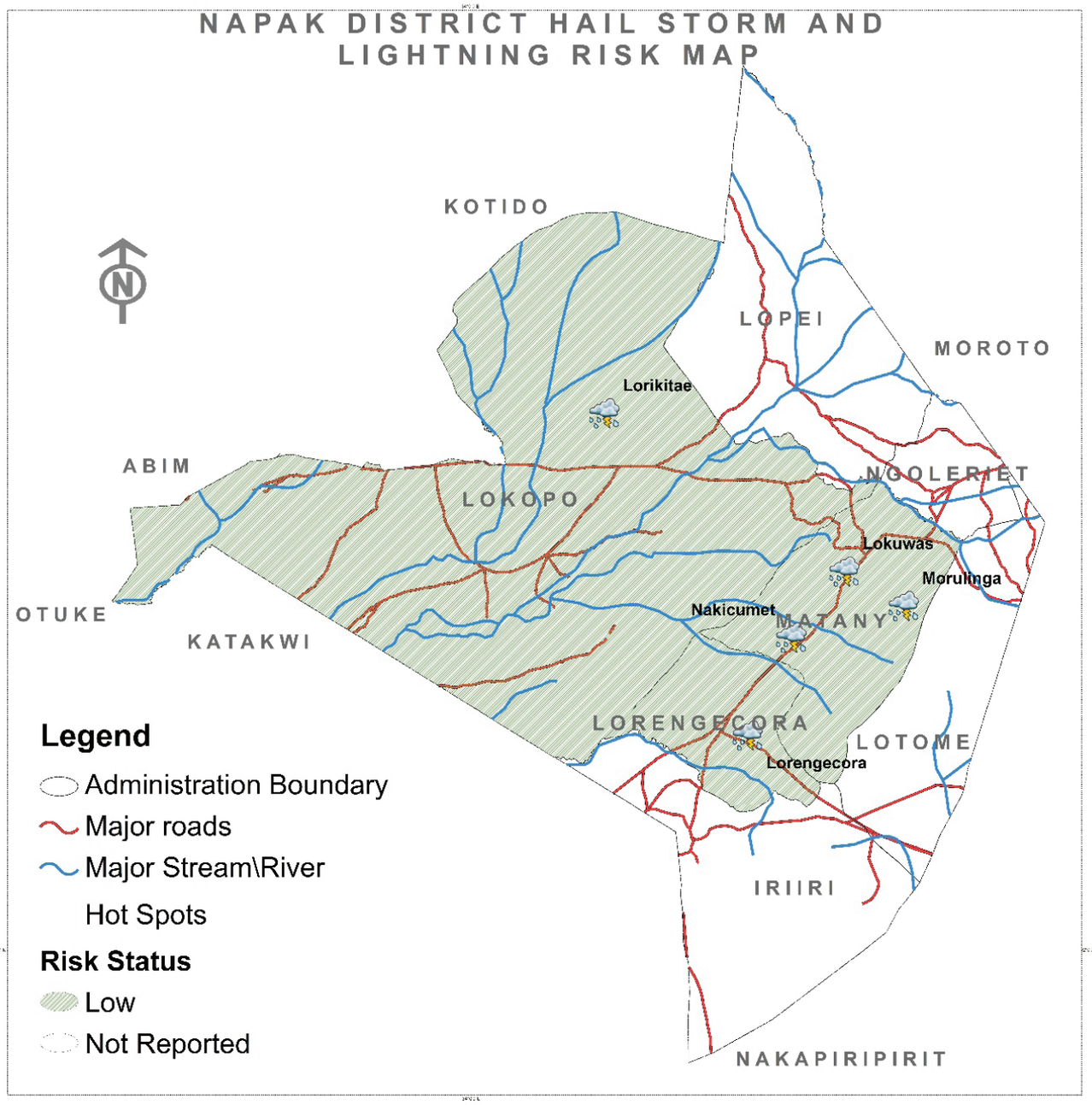

Figure 5 Lightning and hailstorm risk

Lightning and hailstorms are associated with heavy rains. Most buildings do not have lightning arresters which exposes them to increased threat of destructive lightning strikes. People have been killed and schools and social facilities have often closed after lightning strikes. In Lokwas, Morulenga and Nakichumet for example, human and livestock deaths have been reported. Lopeei (Lorikatea parish) and Lorengechora also suffer incidents of lightning.

Bushfire Risk

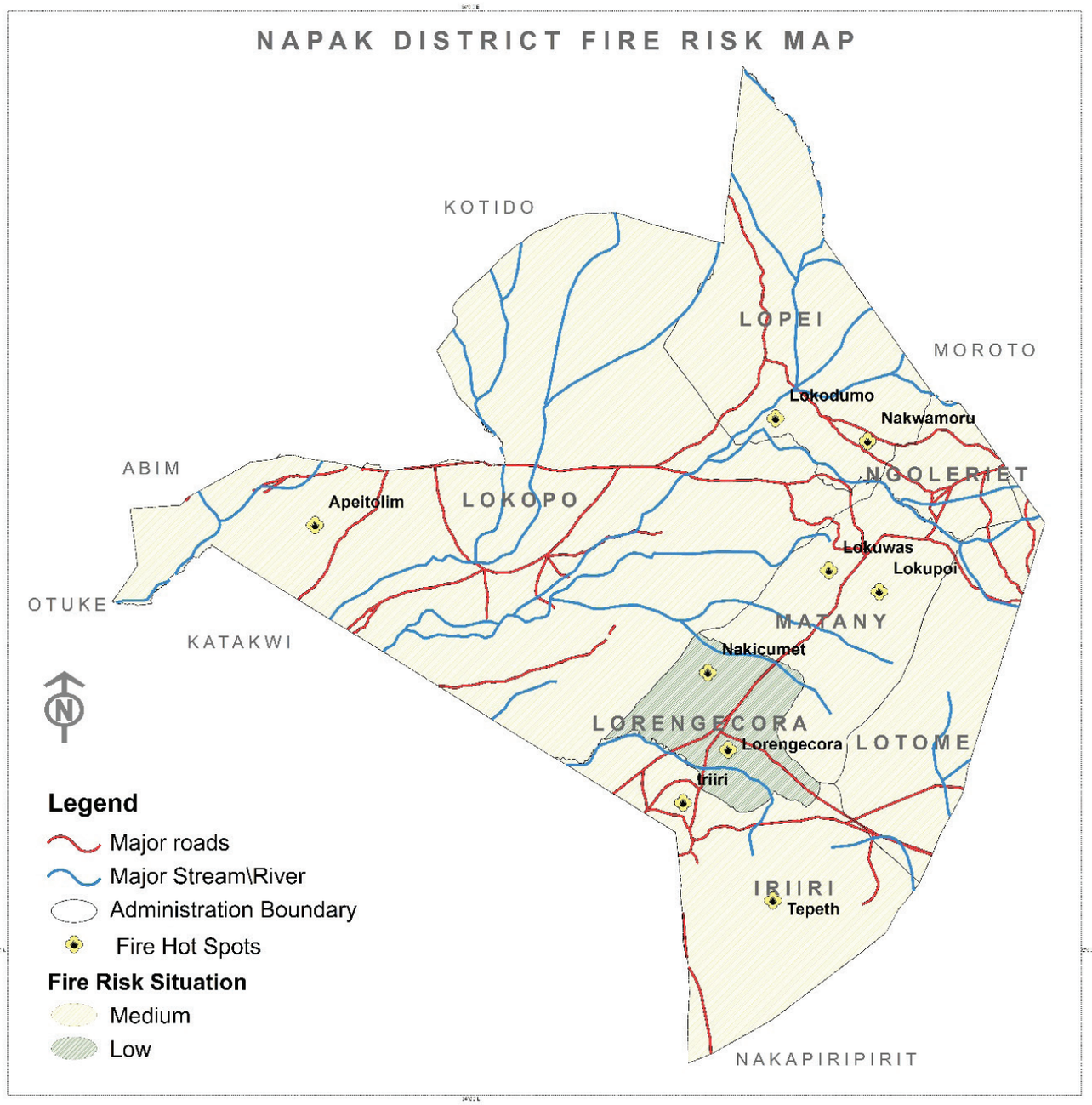

Figure 6 Fire risk

Fires are common during the dry season. Farmers burn the grass to control ticks and to generate fresh pasture for their livestock, and lose control of the fire. There are cases of hunters burning the bush in order to flush out wild game. Generally bushfire incidence is moderate and scattered throughout the district. Fires are reported in the parishes of Lokwas and Lokupoi (Matany Sub-County), Nakwamoru and Lokudumo Parishes (Lopeei Sub-County), Nabwal, Iriri (Natrobenya and Alekilek villages) and Tepeth parishes in Iriiri Sub-County.

Pest and Parasitic Infestation Risk

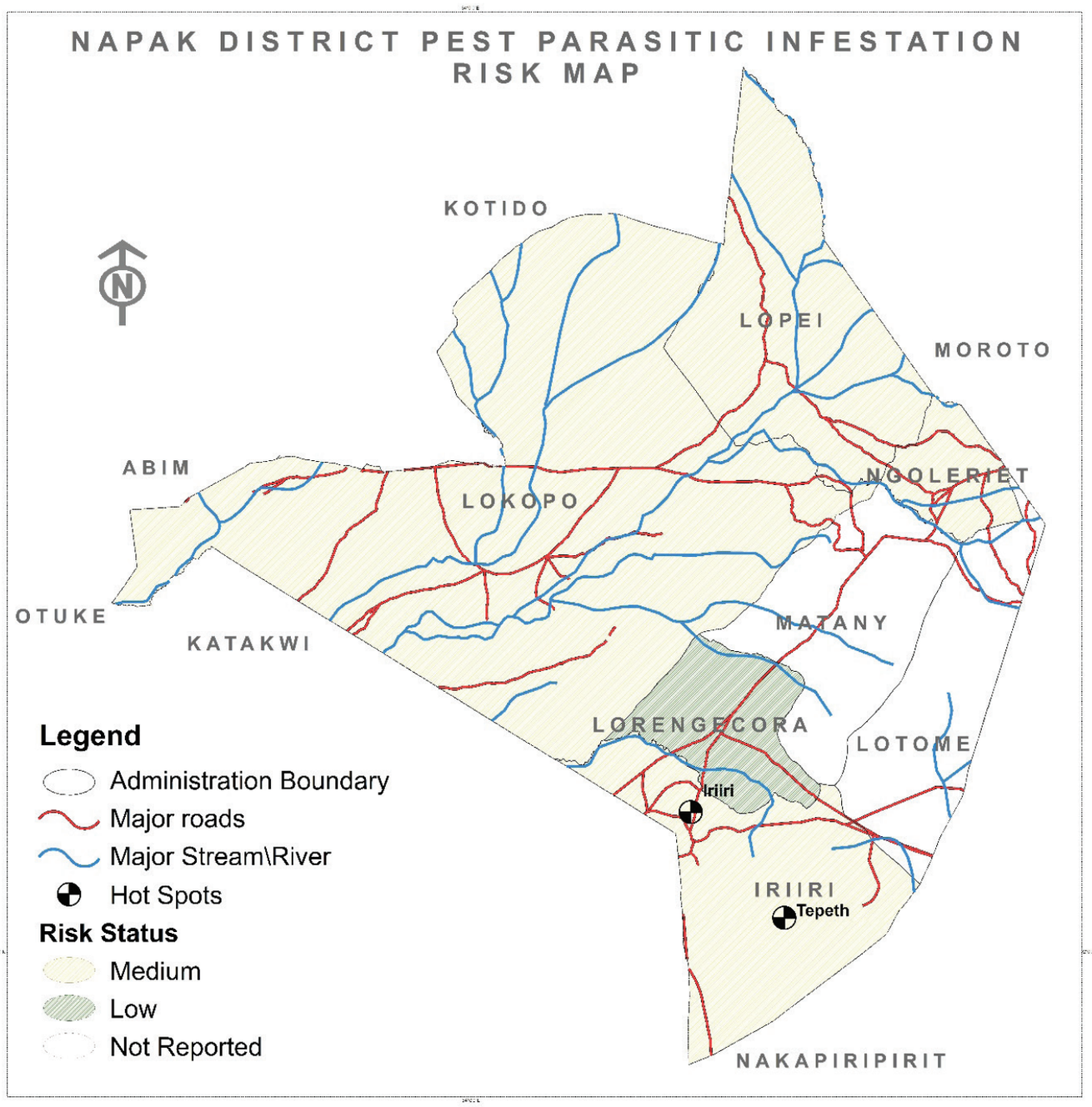

Figure 7 Pest and parasitic infestation risk

Cases of pests are reported in most sub-counties except Lotome and Matany. The main crop affected by pests in the district is sorghum. The effect of pest and parasitic infestations is reduced crop yields, putting the population at risk of food insecurity and poor standards of living, reflected in low incomes at the household level. Risk hot spots are recorded in Tepeth and Iriri Parishes, Iriiri Sub-County and relatively low risk levels in Lorengechora.

Cattle Theft Risk

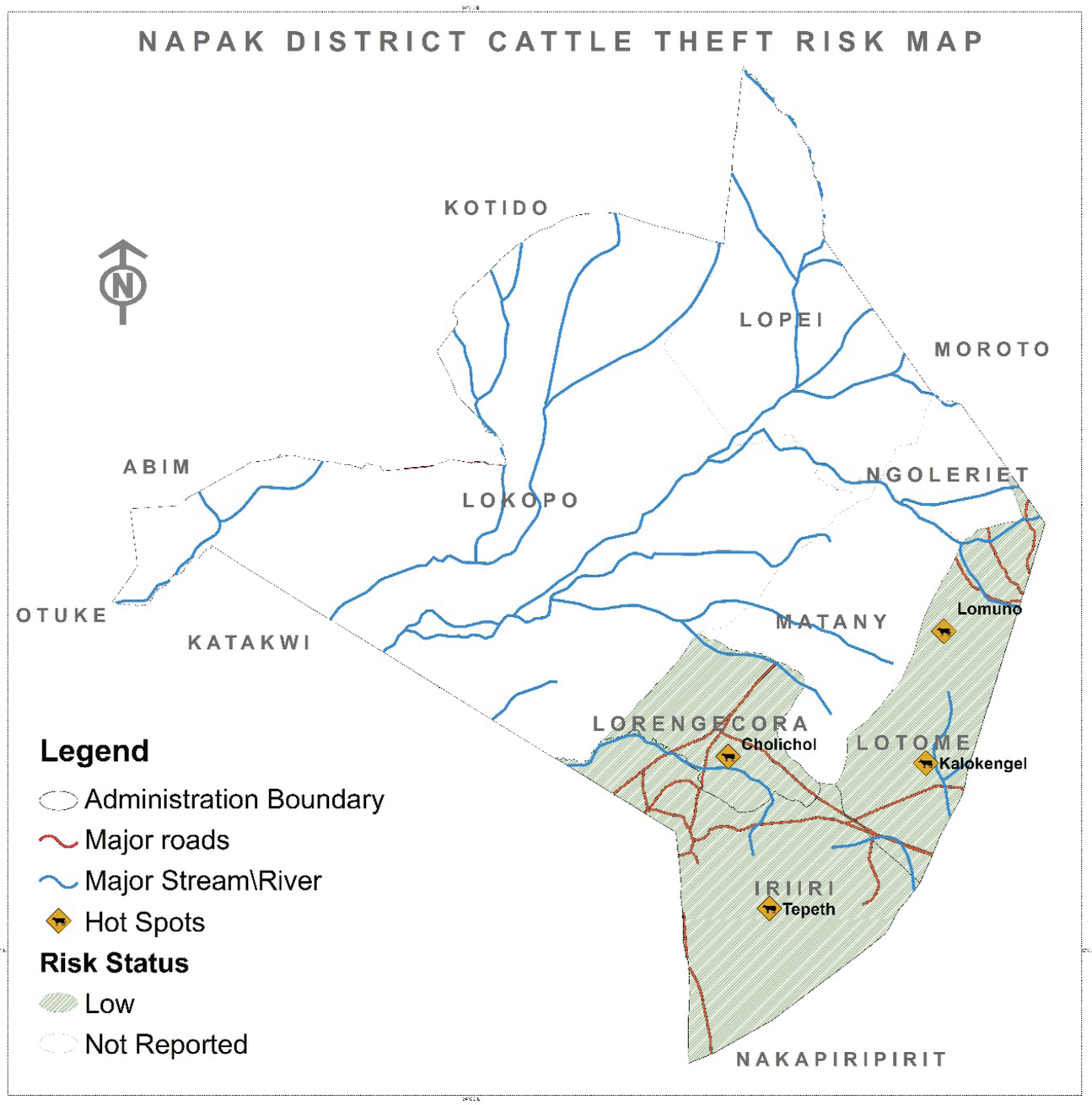

Figure 8 Cattle theft risk

Cattle theft incidence in the district is in steep decline, with most cases resolved immediately. Incidents of cattle theft are reported in Lokopo, Lopeei, Lotome, Iriiri and Lorengecora Sub-Counties in the Parishes of Lomuno, Kalokengel East, specifically in the villages of Naitakwae, Nakaromwae, Koititi, Loluk, Naacuka and Angarab. In general the thieves are residents of those areas although some come from nearby districts of Moroto, Nakapiripirit and Katakwi.

Environmental Degradation Risk

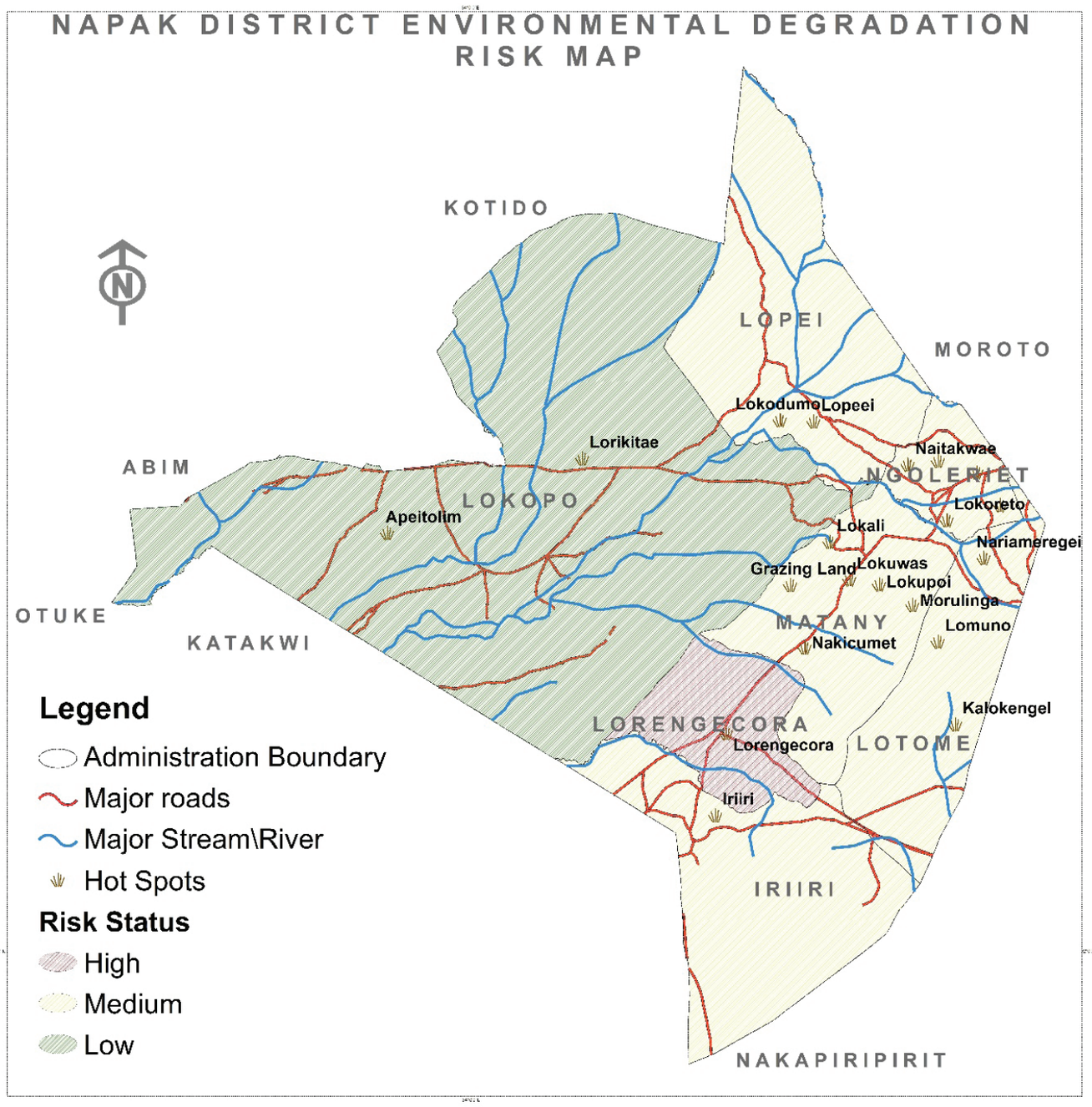

Figure 9 Environmental Degradation Risk

Napak District is the main source of charcoal and fire wood consumed in the Teso Sub-Region, mainly in Soroti district. To meet this demand, commercial charcoal burning is an active industry in Napak, contributing significantly to deforestation.

Lorengechora Sub-County records high incidence of environmental degradation in the district. Other risk hot spots are reported in; Matany Sub-County (Nakichunmet, Lopoi, Lokuwas and Lokali parishes). Opeitolim and Lorikatea risk hot spots are reported in Lokopo Sub-County.

Crop and Animal Diseases Risk

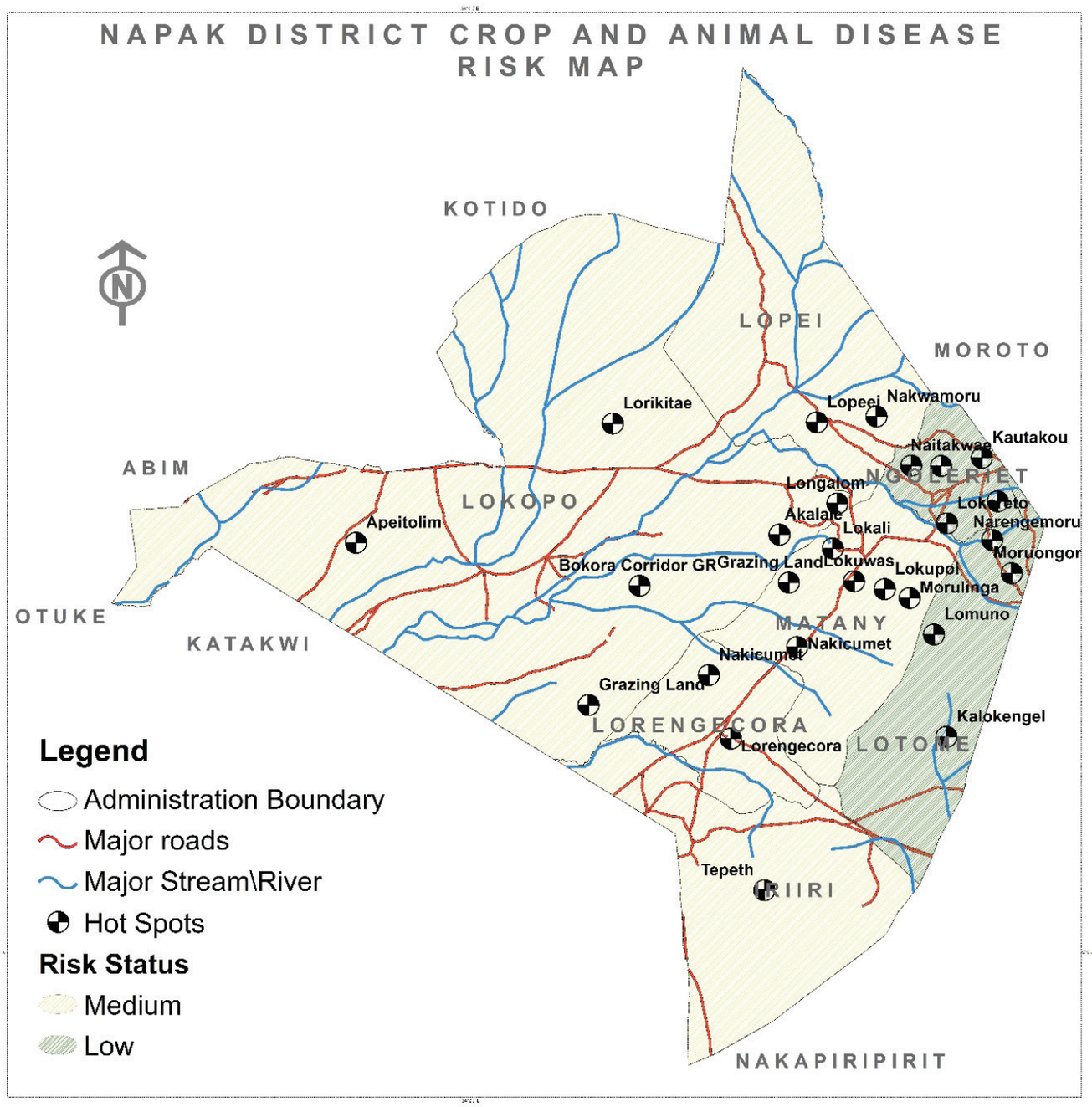

Figure 10 Crop and animal diseases risk

Crop and animal diseases occur throughout the district though the magnitude of risks vary from one sub-county to the other. Lotome and Ngoleriet report moderate risk levels. Matany (Nakicumet, Morulinga, Lokupoi, Lokuwas and Lokali) register many risk hot spots. Others are in Bokora Corridor GR and Apeitolim parishes.

Vermin risk

Problem animals are common around Mount Napak and Lorengecora Sub-County where cases of gardens being destroyed by wild pigs, monkeys and rats are reported. Pian-Upe Game Reserve is a source of these animals. Nabwal, Tepeth and Nakayot parishes suffer from vermin. Risk is reported highest in Iriiri Sub-County especially in Tepeth Parish.

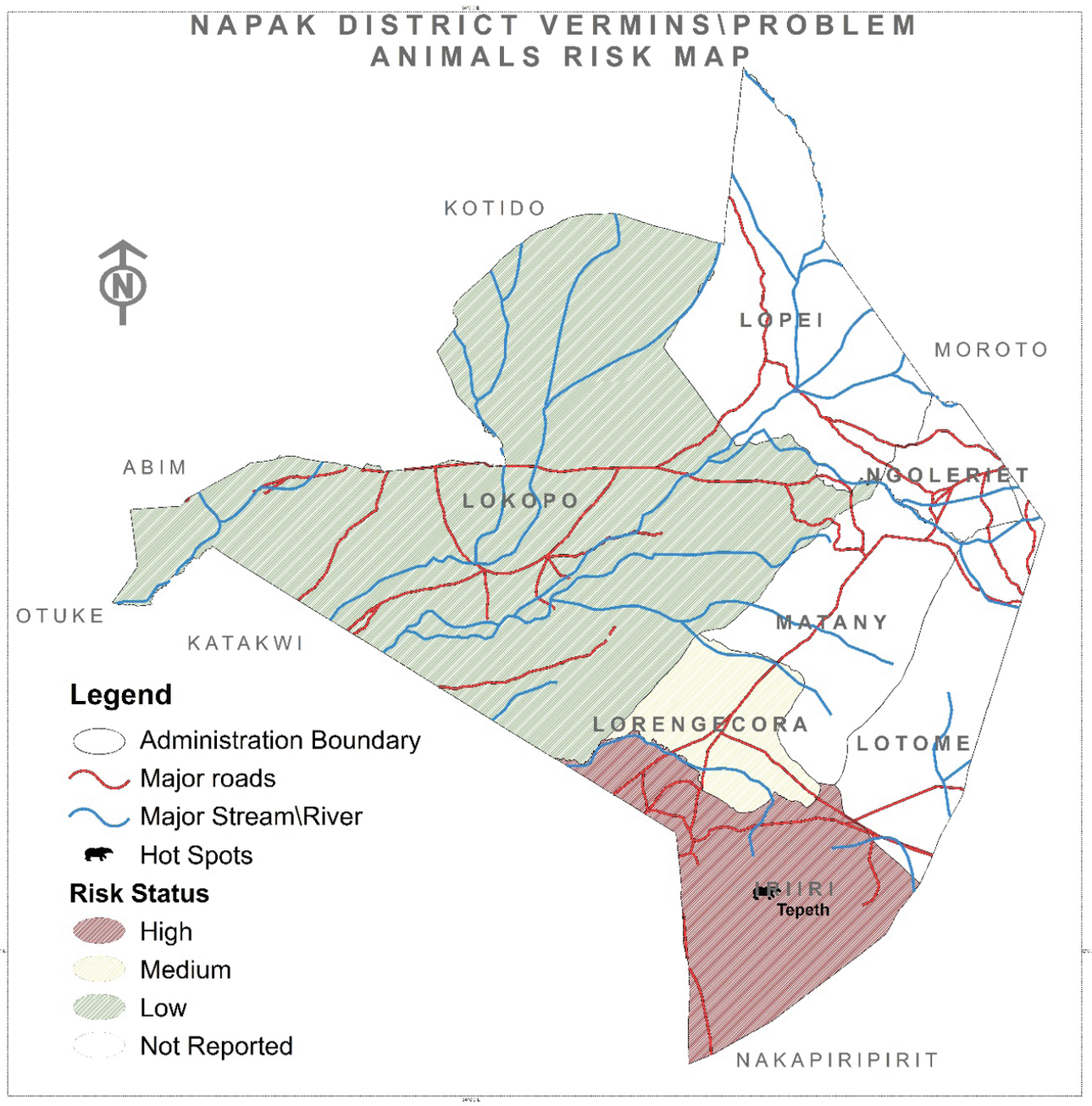

Figure 11 Vermin risk

Strong Wind Risk

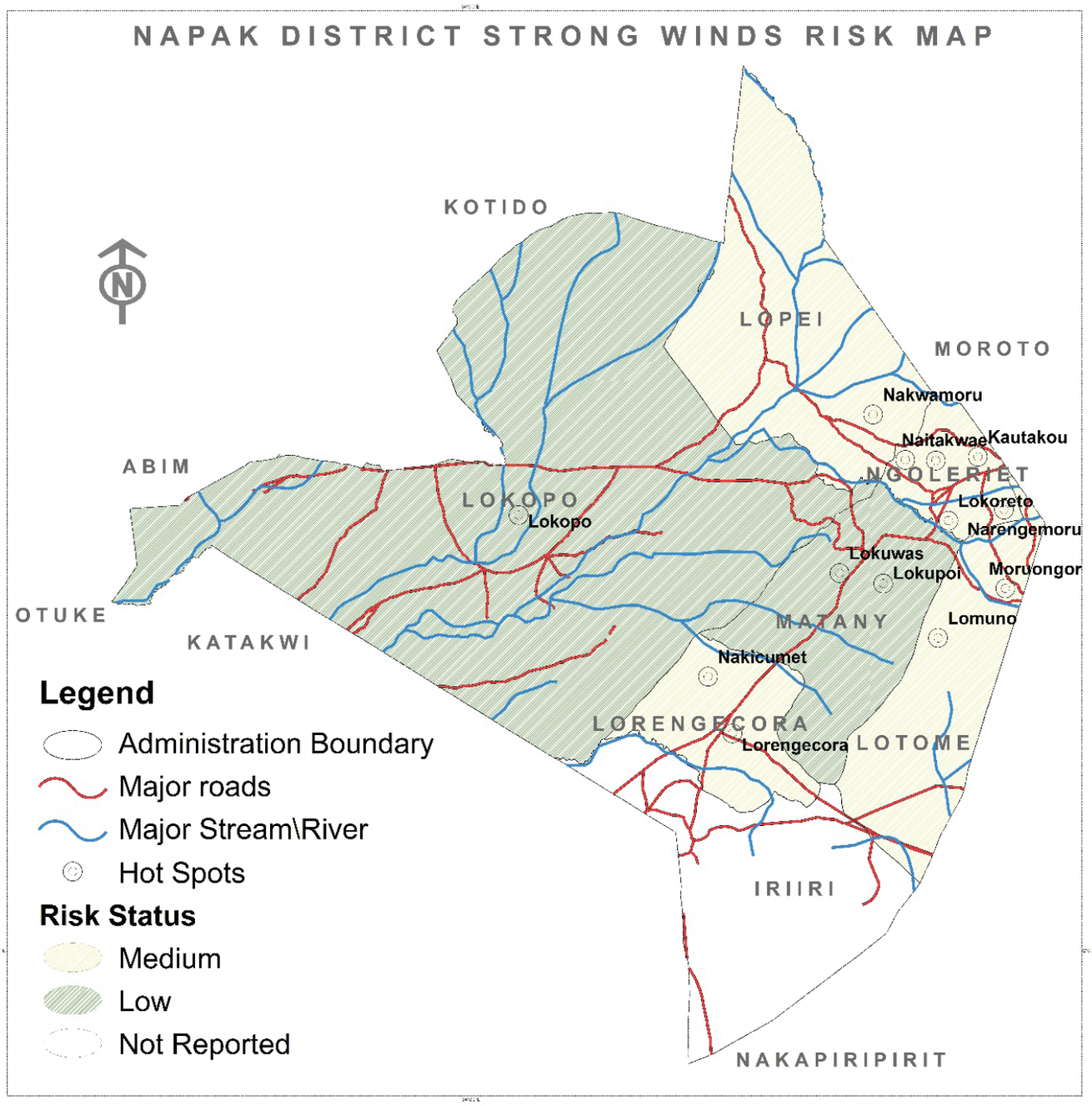

Figure 12 Strong wind risk

Strong winds occur mainly during the dry season. Charcoal making has led to severe deforestation leaving the ground bare and vulnerable to wind erosion. The winds have destroyed crops, homesteads and social service points such as schools. Risk hot spots are reported in Kautakou, Lokoreto, Narengemoru Parishes in Ngoleriet Sub-County. Others are in Lokopo and Lopeei Sub-Counties.

VULNERABILITY

Vulnerability Risk

Table 6 quantifies the subjective risk values judged by the sub-county communities in Table 3, assigning 3, 2, 1 and 0 to "high", "medium", "low" and "not reported" respectively. Summing the rows and sorting the totals provides a ranking of hazards and the risks they present. Summing the columns gives an indication of the relative aggregate risk felt in each sub-county or town council.

Table 6 Vulnerability assessment

Hazard	Ngoleriet	Lokopo	Lotome	Lopeei	Lorengecora	Lorengecora TC	Iriri	Matany	Totals
Human Diseases	2	2	2	2	3	3	2	2	18
Drought	3	2	2	2	2	2	2	2	17
Bushfires	2	2	2	2	2	1	2	2	15
Environmental Degradation	2	1	2	2	3	1	2	2	15
Crop And Animal Disease	1	2	1	2	2	2	2	2	14
Flood	1	3	1	2	2	0	2	2	13
Land Conflict	2	2	2	0	2	2	2	1	13
Strong Wind	2	1	2	2	2	2	0	0	11
Pest Infestation	2	2	2	2	1	0	2	0	11
Lightning	0	1	2	2	1	1	2	1	10
Vermin	0	1	0	0	2	1	3	0	7
Cattle Theft	0	1	0	1	1	0	1	0	4
Total	17	20	18	19	23	15	22	14	
Score: High = 3, Medium = 2, Low = 1, Not reported = 0									

Risk Vulnerability Map

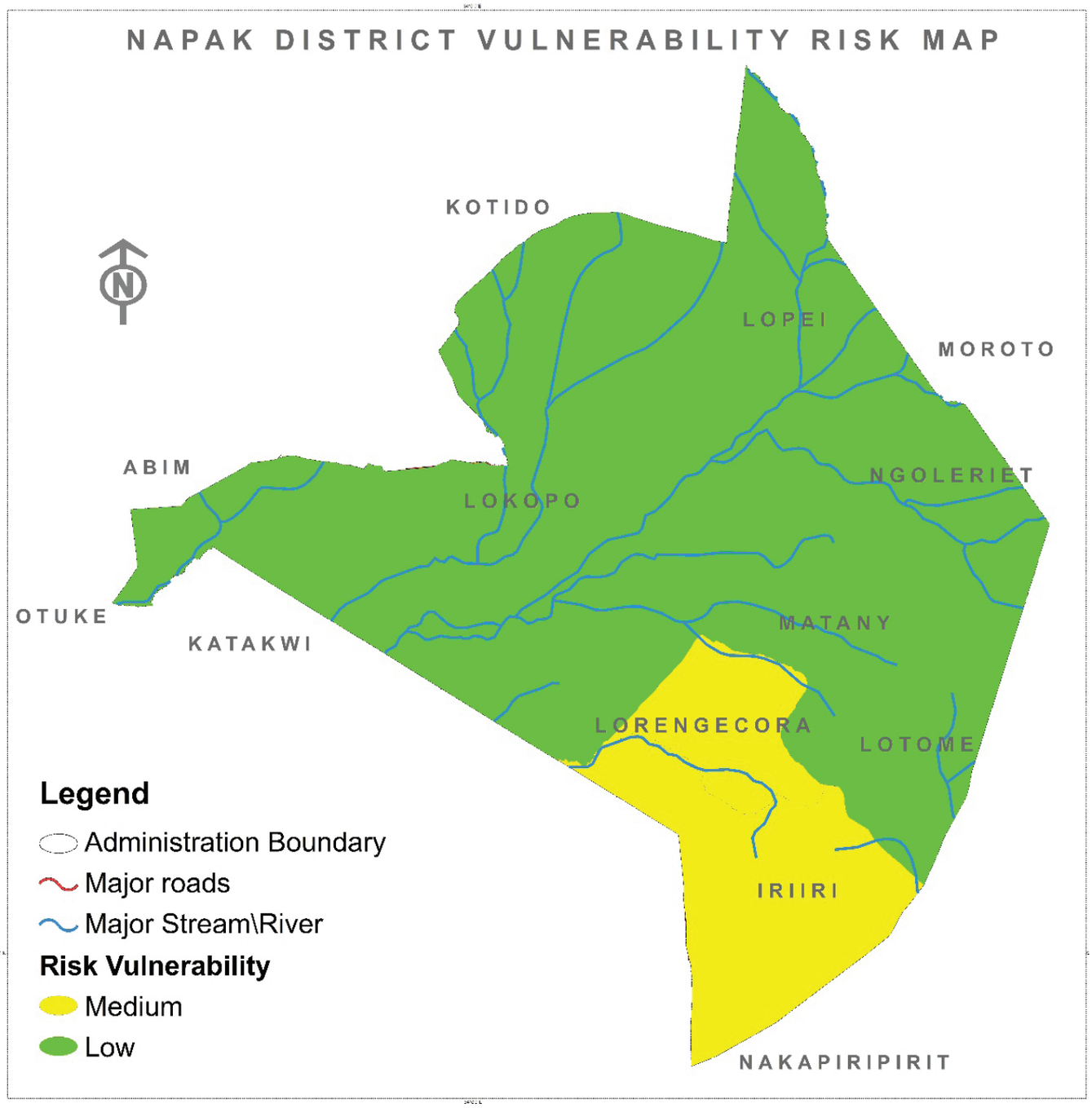

Figure 13 Risk vulnerability map

Figure 13 shows the Napak sub-counties colour-coded using the aggregate risk totals provided in *Table 4,* classified according to the sub-ranges defined in the legend. Vulnerability to compound hazards presents disaster risk reduction and emergency response issues that this map can help to expose.

The Napak District risk vulnerability map shows two zones, of medium and low aggregate risk. The low risk vulnerability sub-counties are Lokopo, Lopei, Ngoreriet, Matany and Lotome. These areas mainly deal with floods, land conflicts, crop and animal diseases, and others to lesser extents. The floods affect the entire district which is low lying and takes the flows from the river Omanimani.

Lokopo Sub-County has high flood risk.

The sub-counties reporting moderate risk vulnerability are Iriiri and Lorengecora. The hazards impacting these areas are human disease, drought and food insecurity among others. The human diseases are attributed to poor sanitation and hygiene practices in the area. Erratic climatic conditions contribute to drought and food insecurity and in extreme cases have led to loss of lives especially among the elderly in the community.

CONCLUSIONS

The multi-hazard vulnerability profile produced in this mapping exercise combines physical data and perceptual information captured with participatory methods in Napak District. It provides an understanding of how the district perceives each hazard based on likelihood of occurrence and its impact on the local communities.

The findings identify human diseases, drought, bushfires, environmental degradation, crop and animal disease, flood, land conflict, strong wind, pest infestation, lightning, vermin and cattle theft as the predominant hazards in the district, in order of decreasing risk.

Human diseases, drought, bushfires and environmental degradation ranked closely as the most dangerous and high-risk hazards for people in Napak District.

The Napak sub-counties have moderate to low vulnerability to disaster, accumulating risk from several hazards. The northern sub-counties of Ngoleriet, Lokopo, Lotome, Lopeei and Matany record low aggregate vulnerability levels, and Iriri, Lorengecora and Lorengecora Town Council have medium aggregate vulnerability. Lorengecora and Lorengecora Town Council have high risk of human disease due to poor sanitation facilities, and Lorengecora suffers from severe deforestation. This aggregated vulnerability to several hazards at once compounds the exposure to disaster risk and the complexity of managing it.

The mapping exercise demonstrates the value of integrating spatial information with community perception of hazards in the understanding of disasters in Napak District. This disaster risk knowledge should therefore inform the disaster mitigation plans developed by the Napak district local government that direct actions to 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.

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

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

Crop and animal Diseases. Animal Diseases include swine fever, foot and mouth disease, naganan, and bird flu. Crop disease Diseases 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.

With support from:

United Nations Development Programme
Plot 11, Yusuf Lule Road
P.O. Box 7184
Kampala, Uganda
For more information: www.undp.org

Empowered lives.
Resilient nations.

With support from:
United Nations Development Programme
Plot 11, Yusuf Lule Road
P.O. Box 7184
Kampala, Uganda
For more information: www.undp.org

Empowered lives.
Resilient nations.