# Geospatial analysis of the factors affecting access to water for livestock in the drylands of Uganda: a case of upper Lokere catchment in Karamoja sub-region

Mugisha Abubakar[53]

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## Introduction

This study was done to investigate the factors affecting access to water for livestock in the Upper Lokere catchment, Karamoja sub-region, Uganda. Access to water was analysed in terms of its availability, distribution, and functionality of water sources using geospatial analysis of secondary spatial data including hydrologic modelling with SWAT.

## Study objectives

1. To study spatial and temporal variability in access to water for livestock in upper Lokere catchment,
2. to examine how environmental factors affected access to water for livestock in upper Lokere catchment,
3. to study how technical factors affected access to water for livestock in Upper Lokere catchment,
4. to investigate the effect of social factors on access to water for livestock in Upper Lokere catchment.

[53] Mugisha Abubakar graduated in February, 2021 with Msc. Natural Resources Management from Nkumba University

## Methodology

The sample size for the study was 245 households that keep livestock, out of which 247 respondents were interviewed. The target population constituted all households within the Upper Lokere catchment. A sample was drawn from the 51,299 households in the entire Lokere catchment (MWE, 2017.

## Key findings

The study indicated a declining growth trend in livestock numbers attributed to inadequate access to water despite an annual water yield of 162MCM determined from hydrological modelling with SWAT). This potential is under-exploited due to the limited storage capacity of developed water sources with an overall potential harvest of 6.9MCM/yr., if maintained and at 100% functionality. This is against a livestock water demand of 9MCM/yr., implying a deficit of 2.1 MCM/yr.

The study also found variability in access to water for livestock in the study area due to unevenly distributed water sources with high concentrations around settlements and away from grazing areas and pastoral migratory corridors, indicating a domestic water supply oriented approach to water development which increases distances moved by pastoralists in search for water, especially in dry seasons. The average distance to water sources varied from 2km during the wet season to 7km during dry seasons. Access to water for livestock was strongly affected by environmental factors especially

unevenly distributed and irregular rainfall and high temperatures.

## Key recommendations

The government of Uganda should improve the spatial coverage of livestock water sources based on a participatory and holistic spatial planning approach that focuses on high-capacity, multi-purpose facilities through a collaborative water development framework with development partners. The Ministry of Water and Environment needs to standardize water source designs especially sizes /capacity of sources/ troughs as well as ensure integration of water source protection measures into overall water source planning and construction project budgets. The government of Uganda should undertake a strategic environment and social impact assessment of the mining sector in Karamoja to study how the growing mining sector affects pastoralists.

## Key references


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