

**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF WATER RESOURCES ENGINEERING
PROJECT IMPLEMENTATION REPORT

**ASSESSING THE IMPACTS OF CLIMATE CHANGE ON
GROUNDWATER POTENTIAL ZONES:
CASE STUDY: AGAGO DISTRICT**

By

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BU/UG/2021/0086

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*This project implementation report is submitted to the
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ABSTRACT

The world's population is expected to rise over the next fifty to sixty years, peaking at 10.3 billion in the mid-2080s from 8.2 billion in 2024. Groundwater is a key component of sustainable development, but it is being jeopardised by the monstrosity that is climate change. This research aimed to determine the effects of climate change on groundwater potential zones in Agago District for 1992 to 2020 through Analytical Hierarchy Process(AHP), GIS and remotely sensed data. Landsat and Sentinel satellite remotely sensed data were utilised to study Land use/Land cover change. The projections for groundwater potential zones in 2030 and 2040 were conducted using QGIS MOLUSCE. The results indicated a 13.18% decrease in areas of good potential between 2000 and 2020 and a 13.18% increase in fair potential zones. These changes were attributed to variations in land use and land cover (LULC), as well as alterations in rainfall patterns. The results of this study are critical for creating climate-resistant water resource management strategies and, consequently, for the lasting preservation of groundwater in this area.

DECLARATION

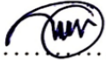
DECLARATION

I, Toorach Francis, a Bachelor of Science in Water Resources Engineering student at Busitema University, hereby declare that the project report entitled "ASSESSING THE IMPACTS OF CLIMATE CHANGE ON GROUNDWATER POTENTIAL ZONES " is an original work conducted and prepared by me under the guidance of Mr. Mugisha Moses.

I affirm that this report is a result of my efforts and contributions. Any reference to existing research, direct quotations, or paraphrasing has been properly acknowledged and cited by academic standards. This report has not been previously submitted for any degree, diploma, or other qualifications at this or any other institution.

I understand the importance of this declaration and the potential consequences of any breach of academic integrity, including, but not limited to, disciplinary action by my institution. I therefore certify that the information presented in this report is true and accurate to the best of my knowledge and belief.

Date: 10th MAY 2025

Signature: 

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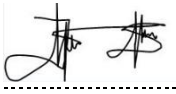
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APPROVAL

This is to certify that this report entitled “ASSESSING THE IMPACTS OF CLIMATE CHANGE ON GROUNDWATER POTENTIAL ZONES ” has been prepared by Toorach Francis under my approval and it covers only his original project work and is ready for submission to the Department of Water Resources Engineering of Busitema University.

SUPERVISOR: Mr. Mugisha Moses

SIGN: 

DATE: 10th May 2025.

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LIST OF ACRONYMS/ ABBREVIATION

AHP – Analytical hierarchy process

DEM – Digital Elevation Model

DGSM – Directorate of Geological Survey and Mines

GPZs – Groundwater Potential Zones

DWRM – Directorate of Water Resources Management

ETM – Enhanced Thematic Mapper

GIS – Geographical Information System

MoWE – Ministry Of Water and Environment

NARO – National Agricultural Research Organization

NASA – National Aeronautics and Space Administration

NFA – National Forestry Authority

NRSA – National Remote Sensing Agency

RS – Remote Sensing

UNMA – Uganda National Meteorological Authority

USGS – United States Geological Survey

UTM – Universal Transverse Mercator

WGS – World Geodetic System

WIOA – Weighted Index Overlay Analysis

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