



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING  
DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING**

**FINAL YEAR PROJECT REPORT  
APPLICATION OF GIS FOR FLOOD HAZARD MAPPING USING BASIN  
MORPHOMETRY  
(CASE STUDY: ACOWA SUB COUNTY)**

**By**

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## **ABSTRACT**

Flood is an inevitable natural phenomenon occurring from time to time in all rivers and natural drainage systems, which not only damages the lives, natural resources and environment, but also causes the loss of economy and health. The impact of floods has been increased due to a number of factors, with rising sea levels and increased development on flood plain. Recurring flood losses have handicapped the economic development of both developed and developing countries.

The presented work is aimed at using GIS techniques to produce a potential flood hazard Map for Acowa Sub County based on geomorphic parameters and to estimate the risk degree of individual sub basin by combining normalized values of the parameters.

The study area is characterized by a bimodal type of rainfall, with peak periods in the months of March-June and September-November, however, it experiences pronounced erratic weather conditions quite frequently, manifesting as excessive rainfall within a short period leading to floods and water logging, and then followed by scarce rainfall over a long period of time (not less than 3 month), resulting in drought. Thunderstorms accompanied by heavy winds usually occur at the onset of every rainy season, often resulting in destruction of buildings, trees, vegetation, crops and sometimes life. Occasional hailstorms during rainfall peaks can result into destruction of crops and even livestock.

Based on the Aster Digital Elevation Model, the drainage pattern of the Acowa's sub-basins were delineated.

The sub-basins were extracted and morphometrically analyzed to assess flash flood susceptibility. The morphometric parameters were measured by stream number and stream length. The parameters were computed using ESRI's ArcGIS 10.1.

The case study results show that 50% of the sub-basins have high susceptibility of flooding and 34% have medium susceptibility and 16% have low susceptibility to flooding. Basins of high and moderate flood risk require detailed studies to implement actions to protect these areas against flood hazard.

**DECLARATION**

I **Edyau Joseph Stephen** declare to the best of my knowledge that the work presented in this proposal is my own and has never been presented to any University or higher institute of learning for any academic award.

Signature..... *Edyau Joseph Stephen* .....

Date..... *30/05/2017* .....



**APPROVAL**

The work presented to my office has been read, understood and produced under my full guidance and supervision.

Eng. Mohammed Badaza

Signature.....

Date.....

## **DEDICATION**

With great pleasure I dedicate this report to my lovely mother **MRS. ANGWARO MARY MARGARET** for all the support she has given to me to make me a better person in future.

Thank you so much mummy.

## **ACKNOWLEDGEMENT**

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