

**GIS BASED SUITABILITY ANALYSIS FOR COFFEE FARMING IN  
ELGEYO-MARAKWET COUNTY**

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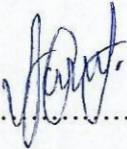
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## DECLARATION

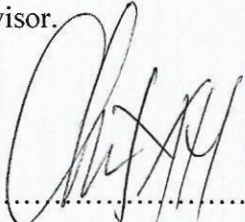
This is to confirm that I, Frankline Rono, whose registration number and signature appears below, undertook this research as my final year project. I also confirm that this work has not been presented in this or any other university for examination or for any other purposes.

I declare that even though I may perhaps have deliberated with others in the preparation of this project, and derived upon a variety of sources cited in this assignment, the content of this work report is my original work.

Signature..........Date.....08/02/2016.....

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This research project has been submitted for examination with my approval as the University Supervisor.

Signature..........Date.....09/02/2016.....

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## **ABSTRACT**

Human population is increasing significantly and the United Nations organization is projecting it to be 9.1 billion people by 2050. Similarly, the Kenya's population was 40 million according to census 2009 and is growing at 1 million persons per year and estimated to be 85 million by 2050. In particular, Elgeyo-Marakwet County (EMC) number of inhabitants is rising hastily as well with a rate of 2.7% per annum. Poverty is following the rising trend leaving the residents poorer and poorer struggling from hand to mouth. The rising population will demand more agricultural produce to cater for their needs.

Land is a limited resource that cannot be expanded in order to have more space for farming activities. The only way to increase agricultural production is to subject the land into a systematic method of suitability to support a given crop and ensuring farming is done where it is best suited. Whereas the main economic activity of EMC is agriculture, coffee production is very low. The purpose for this study was to find a way to enhance sustainable coffee production as one way to increase cash crop production in the county. The objective of this project study was to develop a method and design a spatial model to help in identifying sites in EMC that are suitable for the sustainable production of coffee.

The method and the model created were based on Geographical Information Systems (GIS), Remote Sensing (RS), and Multi-Criteria Decision Making Approach (MCDMA). The relative criteria weights were calculated using AHP technique and a land cover was derived from Landsat8 satellite image. Weighted overlay was used to generate suitability maps in four classes: highly suitable (S1), moderately suitable (S2), marginally suitable (S3), and not suitable (N). Results for the study indicated that of the total area 58.3% and 17.5% was suitable for the production of Arabica and Robusta coffee respectively.

The methodology adopted for this projected can be extrapolated and replicated in larger areas such as the country level as well as applying it in the evaluating land suitability to support the farming of any other crop or in selecting sites for any land use.

**Key words:** AHP; Arabica ; land suitability analysis; Robusta