

**LAND SUITABILITY STUDY FOR RICE GROWING IN KISUMU
COUNTY**

Ronald Owino Abach

G221 – 003 - 0007/2014


Institute of Geomatics, GIS & Remote Sensing

**A thesis submitted in partial fulfilment for Degree of Masters of Science in
Geospatial Information Science and Remote Sensing of Dedan Kimathi
University of Technology**

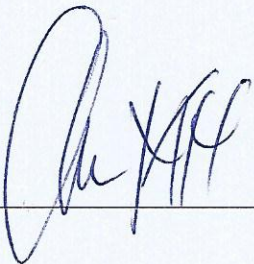
January 2016

Declaration

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

Signature:  Date: 29.01.2016

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

Signature:  Date: 29 / 01 / 2016

Dr. Moses Murimi Ngigi

Dedan Kimathi University of Technology, Kenya

Abstract

Optimum utilization of the available land resources for sustainable agriculture requires land suitability analysis as a prerequisite in order to attain maximum agricultural production. In Kenya, agriculture is the backbone of national economy and rice is one of the most consumed crops but with low production rate which does not meet the demands due to rapid population growth. This study is prompted by this rice crop deficit and the main aim is to determine land suitability for rice farming using remote sensing and GIS based on Multi-Criteria Evaluation (MCE) approach and to compare present land use with potential land use to find more sites in order to expand rice crop growing in Kisumu County.

Four suitability criteria i.e. climate (rainfall & temperature), topography (slope), soil chemical properties (pH & nutrients) and soil physical properties (depth, drainage & texture) were evaluated based on agronomist experts opinions and Food and Agriculture Organization (FAO) guideline for rain-fed agriculture. All data were stored in ArcGIS environment and the factor maps were generated. For MCE, Pair-wise Comparison Matrix known as Analytical Hierarchy Process (AHP) was applied and the suitable areas for rice crop were identified. To generate present land cover map, Landsat8 of May 2015 satellite image was classified using ERDAS Imagine by means of supervised classification.

The results obtained indicate that 21.05% of the agricultural land is highly suitable for rice farming, 41.06% is moderately suitable and 18.46% is marginally suitable. These results imply that Kisumu County has more additional sites for rice farming which could sustain rice crop farming more effectively and efficiently and County Government of Kisumu can use this result to advice the local farmers on the suitable areas for rice planting.

Keywords: GIS and Multi-Criteria Evaluation, Kisumu County, Land Suitability Analysis, Rice Farming.