

**CROP-LAND SUITABILITY ANALYSIS USING GIS AND REMOTE
SENSING IN NYANDARUA COUNTY, KENYA**

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DECLARATION

I hereby declare that the following Master of Science Research Project Report is a result of my own research and it has not been presented in any university for any academic award or for any other purposes.

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Date: 21-01-2015
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This project report has been submitted for examination with our approval as the university supervisors.

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ABSTRACT

Land suitability analysis is a method of land evaluation, which measures the degree of appropriateness of land for a certain use. The aim of this research was to identify and delineate the land that can best support potatoes, using GIS-based Multi Criteria Evaluation technique and Remote Sensing. The study was carried out in Nyandarua County in Kenya. Agriculture is the mainstay of local economy in the study area, but the production is very low. Over the years, farmers have been abandoning crops that are well established in the County, to venture into alternative crops. This has affected the total yield because some of the crops being introduced are not doing well. The county government has plans of boosting production of crops that do well in the region. There is need therefore to identify and delineate suitable areas for growing various crops, and identifying and mitigating limiting factors in order to achieve maximum potential yield.

Three suitability criteria (soil, climate and topography) and seven sub-criteria (soil PH, soil texture, soil drainage, soil depth, rainfall, temperature and slope) were evaluated based on agronomist experts' opinions and FAO guideline for rainfed agriculture. Analytical Hierarchical Process was used to determine relative importance of criteria and the resulting weights were used to construct the suitability maps/layers using GIS software. Finally, land suitability map was generated by overlaying these maps with current land cover map generated from Landsat image through supervised classification.

The results of this research revealed that in the study area, 37.6% of the agricultural land is highly suitable for potatoes cultivation, 51.5% is moderately suitable and 10.9% is marginally suitable. The county government may use the results of this research to advice the local farmers on the suitable areas for potatoes cultivation. This will ensure food security, increase food production to support the growing population hence alleviating poverty and reducing crime in the county.