

ABSTRACT

Related studies that have incorporated both the GIS and Remote Sensing techniques focus on mapping potential arable land only. They identify parameters for arable land and modelled them together based on a GIS map before developing the model for suitability of potential arable land.

This project focuses on mapping the unused arable land in Kwanza sub-county in Trans-Nzoia county. GIS and remote sensing were the main methods used in this study. A GIS model was created through the analysis of a seven-band Landsat 8 OLI-TIRS image acquired on August 17, 2016, planimetric data and base maps created from data of the parameters that best define arable land. These parameters included; Land Use Land Cover (LULC), soil-depth, rainfall distribution, soil-PH, Soil drainage and slope maps. The model was then analyzed by Analytical Hierarchical Process (AHP) and a suitability map obtained. Finally, the suitability map was vectorized and intersected with a classified google earth image of unused land to create a final map that illustrates all the unused arable land in the region.

The results showed that 14.96% of land in Kwanza sub-county is arable yet not used to grow crops. Fallow lands in the region are those to the north border between the sub-county and West-Pokot, as well as land owned by rich elites who value land ownership more than putting the land into good use. Kwanza is an arable area with a number of Agricultural Development Cooperatives (ADC) that sometimes are left fallow due to politics and poor management.

Keywords: Arable land, Unused arable Land, Geographic Information Systems (GIS), LANDSAT 8 OLI-TIRS, Land Use Land Cover (LULC), Analytical Hierarchical Process (AHP), Kwanza sub-county.