

Agro-ecological lower midlands zone IV and V in Kenya using GIS and remote sensing for climate-smart crop management

Hilda Manzi^{1*} and Joseph P Gweyi-Onyango¹

1- Department of Agricultural Science and Technology, Kenyatta University, P. O. Box 43844-00100 Nairobi, Kenya

***Corresponding author: manzikye@gmail.com**

Keywords; Climate change, Length of Growth Period, Cropping Seasons, Earth Observation Data

Abstract

Food production in Kenya and Africa in recent past has experienced changes in vagaries of weather fluctuations which ultimately have affected crop yield. Farming in Kenya has localized in specific Agro-ecological zones hence understanding crop growth responses in particular regions is crucial in planning and management for purposes of adoption. A number of strategies for adoption and adaptation to changing weather patterns have been deployed yet only limited challenges have been partially addressed or managed. This research examines previous methods used in classifying agro-ecological zones and further provides additional parameters that can be adopted to enable farmers understand and adapt better to the current variable and unpredictable cropping seasons. The research undertakes reviews of previous researches on agro-ecological zones valuations and the use of earth observation data/products such as; Air temperature at surface, Land Surface temperature, evapotranspiration, soil temperature, soil moisture content in order to better understand and respond to new phenomena occurring as result of climate change in the marginal agricultural areas. Significant variation in precipitation, ambient temperature, soil moisture content and soil temperature become evident when earth observation data are used in evaluation of Agro-ecological lower midland zone IV and V. The said variations cut across areas within the agro-ecological zones that have been allocated similar characteristics when assigning cropping seasons. Significantly the research confirmed outcomes of previous studies that had reported significant shifts or changes in rainfall and temperature patterns across East Africa region. Our findings further pushes for the need for re-evaluate of the agro-ecological zones based on the recent earth observation datasets in their diversity. The research emphasizes on the use of multiple climate and soil-related parameters in understanding climate change in the other marginal areas of Kenya.