**ABSTRACT**

Climate change is real! Temperatures are rising, weather is becoming more extreme and less predictable, and drought is an increasing danger for communities from California to the Sahel. Though impacts of these changes are global, third world economies are more at risk primarily because of their high dependence on natural resources, poverty, low capacity to adapt (Kabubo-Mariara and Kabara 2015) and lack of technological prowess (Mwendwa and Giliba 2012). Moreover, little or no information about the change and applicable mitigation and adaptation measures exacerbate the situation. Although agriculture remains the backbone of Kenya’s economy directly and indirectly supporting more than 75 percent of the Kenyan population (FEWS NET 2013), the sector’s dependence on natural resources makes it very vulnerable to the aggravating impacts of climate change and variability. Climate system variations that impact staple food crops like maize (corn) ultimately threatens the food security of the nation. There is therefore need to apply more advanced technologies in enhancing the sustainability of the agriculture sector in order to improve food security. This study aims to apply Geographic Information Systems and remote sensing in analyzing temporal changes in environmental attributes (temperature, rainfall and solar radiation) that affect maize production in Bungoma County, Kenya. It purposes to map out suitable growing times for this crop as well as changes in their occurrence over a period of ten years (from 2005 to 2015). An overlay of yield statistics will also be performed to explain the various implications of the changes on maize production and food security in the country. The study will also utilize indigenous knowledge systems to inform a contextualized suitability model that will be useful in planning and designing mitigation and adaptation measures to sustain maize farming in the changing and varying climatic conditions.