## Abstract

Estimates of potential evaporation or evapotranspiration (ET) are essential input for rainfall-runoff modeling and water balance calculations. Rain-fed agriculture continues to be the backbone of Kenya's economic activities. This study focuses on the rainfall and ET regimes in Murang'a County. The variability of the elements may hinder agricultural development in the County and the country's ability to achieve sufficient food production, which is dependent on water management. The study utilizes meteorological controls on evaporation, and assesses the potential effects of climate change in mean monthly temperature, net radiation, vapour pressure, wind speed and rainfall for three climate models. The rainfall in the area depicts the equatorial bimodal regime, with ET closely mimicking it. The models show change in climate by the year 2050, relative to the 1961-1990 average. The climate models produce three different changes, implying some level of uncertainty for future agricultural production with various consequences on future food security for Murang'a residents. This could also be true for other regions in Kenya. Thus calls for intensive study on individual effect of each parameter on ET. This is necessary for appropriate climate and irrigation control that can lead to adjustment in the selection of crops for sowing in either of the rain seasons to maximize crop yield productivity.