

## Abstract

The decline in March–May (MAM) ‘boreal spring’ rainfall is of great concern to Kenya’s agricultural sector. This study examines factors influencing MAM rainfall variability based on monthly observed and Climatic Research Unit (CRU) reanalysis rainfall datasets for the period 1971–2010. The distribution patterns of MAM rainfall were analyzed using Empirical Orthogonal Functions (EOF), whereas the Sequential Mann–Kendall (MK) statistic was used for trend analysis. Factors influencing seasonal rainfall were determined and assessment of the circulation anomalies associated with wet/dry condition during the study period was carried out. The MAM rainfall revealed decreasing trend. Wet years are associated with enhanced low-level convergence and upper-level divergence of winds, advection of moisture flux following a well-positioned and intensified Arabian high-pressure cell, and an accompanying rising branch of Walker circulation over Indian Ocean (IO). The sea surface temperatures anomalies (SSTAs) in the central and sub-tropical IO are closely related to MAM rainfall over Kenya. Positive SSTAs accompanying negative OLR anomalies may lead to intensified rising branch of the Walker circulation influencing the MAM wet events in Kenya. There is a negative correlation coefficient of  $-0.62$  between MAM rainfall and Outgoing Long-wave Radiation (OLR) indicating that the inter-annual variation of the MAM rainfall and OLR are in opposing phases and, hence, more convection and enhanced rainfall over the study domain. The study reveals that the circulation anomalies associated with the dry years are opposite to those in wet years, forming a good basis of monitoring similar events in future.