

Seasonal Rainfall Variability and Drought Characterization: Case of Eastern Arid Region, Kenya

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Abstract

Drier parts of Embu County, Eastern Kenya, endure persistent crop failure and declining agricultural productivity which have been attributed, in part, to prolonged dry-spells and erratic rainfall. Nonetheless, understanding spatial-temporal variability of rainfall especially at seasonal level, is an imperative facet to rain-fed agricultural productivity and natural resource management (NRM). This study evaluated the extent of seasonal rainfall variability and the drought characteristics as the first step of combating declining agricultural productivity in the region. Cumulative Departure Index (CDI), Rainfall Anomaly Index (RAI) and Coefficients-of-Variance (CV) and probabilistic statistics were utilized in the analyses of rainfall variability. Analyses showed 90 % chance of below cropping-threshold rainfall (500 mm) exceeding 213.5 mm (Machanga) and 258.1 mm (Embu) during SRs for one year return-period. Rainfall variability was found to be high in seasonal amounts (CV = 0.56 and 0.38) and in number of rainy-days (CV = 0.88 and 0.27) at Machang'a and Embu, respectively. Monthly rainfall variability was found to be equally high even during April (peak) and November (CV = 0.42 and 0.48 and 0.76 and 0.43) with high probabilities (0.40 and 0.67) of droughts exceeding 15 days in Embu and Machang'a, respectively. Dry-spell probabilities within growing months were high (81 %) and (60 %) in Machang'a and Embu respectively. To optimize yield in the area, use of soil-water conservation and supplementary irrigation, crop selection and timely accurate rainfall forecasting should be prioritized.

Key words:

Cumulative-departure-index

Drought-probability

Rainfall-anomaly-index

Rainfall-variability