ABSTRACT

Characterization of rainfall based on Intensity-duration-frequency (IDF) curves is crucial in water resources engineering. IDF curves are used in management of hydraulic structures within a river basin. IDF curves for tropical river basins are still scanty. In this research, characterization of rainfall was achieved by developing the IDF curves for Upper Tana River basin using data from eight meteorological stations. Monthly rainfall quantities were first ranked in descending order. The corresponding return period for the data series was determined using Weibull method. An empirical function for IDF curves was then formulated using regression analysis. The IDF curves for different rainfall intensities that correspond to return periods of 2, 5, 10, 25, 50 years and rainfall duration ranging from 1 to 12 hours were generated using the empirical function. The IDF curves are recommended for use as decision support tool in water resource systems within the basin.

Key words: IDF curves, water resource systems, rainfall intensity, return period, Upper Tana River basin