

Comparison of Gamma and Weibull distributions in simulating hourly rainfall in peninsular Malaysia

ABSTRACT

Prior knowledge of rainfall is essential in the planning and lessening of the risks associated with extreme events such as floods, landslides and erosions. The development of a reliable model is therefore, crucial in predicting rainfall series that is parallel to the local climate. In this study, a weather generator is chosen to model hourly rainfall time series in Peninsular Malaysia. Short duration rainfall such as hourly scale is an inherent aspect of tropical rainfall, and instigates many flooding events, especially in the western part of the peninsular. Two distributions, Gamma and Weibull are incorporated into the rainfall generator and their performances in generating rainfall series are then compared. Simulations using both Gamma and Weibull distributions are individually conducted at forty stations across the peninsular. Results reveal that both Gamma and Weibull distributions are able to capture rainfall characteristics at the study sites. However, Gamma is found best to represent rainfall at sites located in eastern and southern parts of the peninsular whilst Weibull is more suitable for western and northern parts. Hence, Gamma is more suitable for representing monsoon rainfall while Weibull is more appropriate for inter-monsoon rainfall.

Keyword: Rainfall intensity; Gamma; Weibull; Hourly rainfall