PARAMETER ESTIMATION FOR GENERALIZED EXTREME VALUE DISTRIBUTION OF EXTREME RAINFALL IN JOHOR

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To my beloved father, mother, brother and sisters
thank you for all your love and support.
(Hj.Nazmi Bin Hj. Othman and Hjh.NoorainiBt Abdullah)
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ABSTRACT

Analysis of extreme rainfall events is essential since the results beneficial for civil engineers and planners to estimate the ability of building structures to survive under the utmost extreme conditions. The annual maximum series (AMS) data of daily rainfall in Johor were fitted to Generalized Extreme Value (GEV) distribution. A study was conducted to determine the best method to estimate parameters of GEV distribution by using method of moments (MOM), maximum likelihood estimators (MLE) and Bayesian Markov Chain Monte Carlo (MCMC) simulations. Previous study show that parameter estimation using MOM was a better method than MLE since MLE method had problem in handling small sample. However, some researchers identified that the performance of parameter estimation of MLE method can be improved when adopting Bayesian MCMC. The performances of parameter estimations by using MOM, MLE and Bayesian MCMC were compared by conducting Relative Root Mean Square Error (RRMSE) and Relative Absolute Square Error (RASE). The results showed that Bayesian MCMC method was better than MOM and MLE method in estimating GEV parameters. Bayesian also had the maximum value return level for 10, 25, 50 and 100 years for most of stations. Therefore, it can be concluded that Bayesian MCMC is the best method to estimate the distribution parameters of extreme daily rainfall amount in Johor.
ABSTRAK