Comparison of Parameter Estimation Methods used in Probability Fitting to Hydrological Events

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ABSTRACT

In hydrology engineering, parameter estimation is of importance in the analysis of probability distribution. It is especially useful in predicting extreme hydrological events like flood so that an accurate and precise outcome can be obtained. In this study, distributions chosen to fit the annual maximum discharge of Sungai Kelantan are the log-normal distribution, the log-Pearson type III distribution and the generalized extreme value distribution. Based on the best-fit distribution chosen according to Chi-squared test, a number of statistical methods by MOM, MLM and MLEs are used to estimate parameters of the distribution. The required expectations and quantile estimates can then be obtained from the distribution parameters with a return period of 2, 10, 25, 50, 100 and 200 years.

Keywords: Parameter Estimation, Method of Moments, Method of *L*-Moments, Maximum Likelihood Estimation, Frequency Analysis, Log-Pearson Type III Distribution, Chi-Squared Test, Goodness of Fit