



## **A Study on Assessment of Uncertainty Associated with Design Rainfall and Selection of Probability Density Function**

Sumiya Uranchimeg (1), Hyun-Han Kwon (2), and Jin-Guk Kim (1)

(1) Chonbuk National University, Jeonju, Republic Of Korea(sumya963@gmail.com), (2) Chonbuk National University, Jeonju, Republic Of Korea(hkwon@jbnu.ac.kr), (3) Chonbuk National University, Jeonju, Republic Of Korea(gkghgmgn@jbnu.ac.kr)

### Abstract

Selection of an appropriate probability density function is the most essential process in a hydrologic frequency analysis. Therefore, various probability density functions have been applied to the frequency analysis, however, there is no clear standard for choosing the best probability density function. A relatively short-term hydrologic data causes significant uncertainty in estimating long term design rainfall or floods. In many design practices, design values over 100-year return period based on 40-year hydrologic data. In this study, we will introduce a parameter estimation method which is based on a Hierarchical Bayesian model for quantitative analysis of uncertainties associated with parameters of the selected probability density function (e.g. Gumbel and GEV distribution). This study also introduces a new goodness-of-fit test for selection of probability density function based on DIC (Deviance Information Criteria) which considers parameter uncertainty and the number of parameters.

Key words : Bayesian model, Gumbel distribution, GEV distribution, DIC

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