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Rainfall parameters and distribution using analytical probabilistic method for Klang Valley, Malaysia

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The Analytical Probabilistic Method (APM) for flood analysis has been applied as an alternative to design storm and continuous simulation method because of its computational efficiency. The objective of this study is to determine the statistical analysis of rainfall at selected catchment area and to determine the analytical probabilistic method parameter at 6 hours of Inter Event Time Definition (IETD). Four catchment areas at Klang Valley were chosen for this study and hourly rainfall and stream flow data for at least 10 years were used to develop the APM parameter. The APM results from goodness-of-fit test indicated that all the rainfall characteristics (i.e., rainfall duration, rainfall depth, rainfall intensity and inter event time) fitted the exponential distribution and the value of APM parameters were presented. APM parameters for catchment area at Klang Valley are presented in a table. The parameters were average duration of rainfall event, t (hr) whereby λ (hr^{-1}) is the parameter for exponential PDF of rainfall duration, average volume of rainfall event, v (mm) whereby ζ (mm^{-1}) is the parameter for exponential PDF of rainfall volume, average intensity of rainfall event, i (mm/hr) whereby β (hr/mm) is the parameter for exponential PDF of rainfall intensity, average inter-event time, b (hr) whereby ψ (hr^{-1}) is the parameter for exponential PDF of inter-event time and average annual number of rainfall events, θ (yr^{-1}). The APM parameter of rainfall duration values range from 0.099 0-0160 hr^{-1}. The exponential PDFs of rainfall depth were range from 0.035-0.077 mm^{-1} while APM parameter for rainfall intensity were range from 0.017-0.433 hr/mm. Lastly, the parameter of exponential PDF of inter-event time range from 0.023-0.077 hr^{-1}. Other related parameters and their distributions were also discussed in the paper.

Biography

Supiah Shamsudin is a Professor at Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia Kuala Lumpur (UTMKL). She holds PhD in Civil Engineering Universiti Teknologi Malaysia, Skudai, Johor (2003), Master in Civil Engineering (hydraulics and Water Resources) University of Nebraska-Lincoln, Nebraska, USA (1992), Bachelor of Science in Civil Engineering University of Miami, Coral Gables, Florida, USA (1982) and Professional Certificate of Education University of Miami, Coral Gables, Florida, USA (1982). Her main specialization in particular is Impounded Water Bodies. Her research interest include intelligent detention pond design, watershed and reservoir management under uncertain environment, environmental hydrology, reservoir eutrophication, fuzzy & risk related approaches, multiobjective engineering and multicriteria decision support for water resources systems.

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