OPTIMIZATION RAINFALL-RUNOFF MODELING FOR CIUJUNG RIVER USING BACK PROPAGATION METHOD

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Author Order	2 of 3
Accreditation	2
Abstract	The rainfall-runoff model is required to ascertain the relationship between rainfall and runoff. Hydrologists are often confronted with problems of prediction and estimation of runoff using the rainfall date. In actual fact the relationship of rainfall-runoff is known to be highly non-linear and complex. The spatial and temporal precipitation patterns and the variability of watershed characteristics create a more complex hydrologic phenomenon. Runoff is part of the rain water that enters and flows and enters the river body. Rainfall-runoff modeling in this study using Artificial Neural Network, back propagation method and sigmoid binary activation function. This model is used to simulate single or long-term continuous events, water volume, making it very appropriate for urban areas. Back propagation is an inherited learning algorithm and is commonly used by perceptron with multiple layers to change the weights associated with neurons in the hidden layer. Back propagation algorithm uses output error to change the values of its weight in the backward direction. The location of the review is the Ciujung River Basin (DAS), the data used are rainfall and debit data of Ciujung River from 2011-2017. Based on training and simulation results, obtained R2 value: 2012 = 0,85102; 2013 = 0,78661; 2014 = 0,81188; 2015 = 0,77902; 2016 = 0,7279. on model 2 = 0,8724. On model 3 R2:ÃƒÂ‚Ã‚Â January = 0,96937; February = 0,92984; March = 0,90666; April = 0,92566; May = 0,9128; June = 0,87975; July= 0,85292; August = 0,95943; September = 0,88229; October = 0,90537; November = 0,93522; December = 0,9111. with MSE (Mean Squared Error) of 0,0018479. The closer value of MSE to 0 and the value of R2 close to 1 then the better designed artificial neural network. If the data used for training more, the artificial neural network will produce a larger R2 value.
Publisher Name	Universitas Mercu Buana
Publish Date	2018-10-29
Publish Year	2018
Doi	DOI: 10.22441/sinergi.2018.3.008
Citation	
Source	SINERGI
Source Issue	Vol 22, No 3 (2018)
Source Page	193-204
Url	https://publikasi.mercubuana.ac.id/index.php/sinergi/article/view/3314/2121
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