The objectives of this study is to apply the theory of backpropagation artificial neural networks for forecasting river discharge in Yom and Nan rivers by computer program namely KUnet. The input data was selected from the recorded data, in rainy season during the months of July to September, of various gauging stations in the river basin by examining their relationship using correlation coefficient value of runoff data from each station which be influential to river discharge at the forecasting station. Two main processes for the algorithm are training process and testing process. For the training process, the recorded data of 5 years during 1996-2000 and of 7 years during 1997-2000 were used for Yom river and Nan river, respectively. For the testing process the recorded data of 2 years during 2001-2002 were used for both Yom and Nan rivers.

The studied results showed that the KUnet program could provide efficiently forecasting daily discharge of both Yom and Nan rivers. The highest forecasting efficiencies for daily discharge were found at 97.28%, and 99.90% by the network structures of 4-3-4-2-1 and 4-3-3-1 for Yom river and Nan river, respectively. The mentioned structures composed of 5 figures represented for the numbers of nodes in 5 layers of input layer, hidden layer 1, hidden layer 2, hidden layer 3 and output layer. When applying the above structures for forecasting discharge in advance for 2 days and 3 days, more than 80% of forecasting efficiencies were found for all cases of both Yom and Nan rivers. These results showed the effectiveness of this forecasting algorithm and the KUnet program. For further application to other rivers, it would be necessary to proceed testing the algorithm parameters separately for each case. In other word, it could not be applied the parameters of specific case to the other cases.

Natpakal Inwong $\underline{\hspace{2cm}}$. 23 / May / 06
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