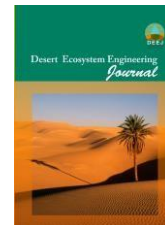




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## Investigation of Artificial Neural Network performance in river flow forecasting (Case study: Ghare Aghaj River Basin, Fars Province)

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### Abstract

In order to river flow forecasting in catchments area in during many years are invented different methods that their efficiency is confirmed. One of these simulation models is neural network that it can draw the existence of truth together with considerable attention. In this research in order to Discharge simulation is investigated meteorological parameters effects on Ghare Aghaj river flow. For this reason, it is used monthly discharge, precipitation and temperature data of present stations with statistical period of 23 years, in during 1981 to 2003. The existing data divided into two groups of train and test after normalization and then they were tested with 5 different types and 9 models and by using from multi layer perceptron neural network together with error back propagation law and also LM and Gdx learning functions. The best network arrangement using from LM learning function was prepared in the case of 9-21-1 with correlation coefficient quantities 1 and 1 for train and test data orderly and for Gdx learning function was prepared in the case of 7-13-1 with correlation coefficient quantities of 0.94 and 0.96. The result represents the meteorological parameters effect like temperature and precipitation is clear on output flow and also exist an inconsiderable difference between simulated and observed quantities. Also, neural network shows a better efficiency in river flow simulation by LM learning function.

**Keywords:** Simulation, Neural Network of Multi Layer Preceptron (MLP), Levenberg– Marquardt algorithm (LM), River flow, Ghare aghaj, Fars Province.

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