Abstract

Water is precious and resuscitative substance on earth and as one of the most valuable natural resources and the the most important issue and challenges of the present century. Water in the Birjand city is great importance due to geographical location, climatic conditions and specific strategy. Aqueduct are used as one of the most important source of water supply for agriculture, livestock and drinking, industrial and etc for people in this area. Due to the decrease of precipitation and drought in recent years as a result of water shortage in Birjand city and Excessive utilization of the groundwater with increasing the number of wells and lack of natural nutrition for various reasons, specially, climate and land use change leads to a reduce the discharge and drying out aqueducts in the region. In recent years the use of artificial intelligence methods in different branches of engineering for complex and non-linear phenomena are used that Adaptive Fuzzy Inference System (ANFIS), including These methods. Therefore, in this study, the ANFIS were used for estimation the rate of aqueducts and prediction groundwater level in Birjand plain and to increase the efficiency of the ANFIS, on the input data of this model, preprocessing operation SUBCLUST and FCM clustering was used in two ways. The results showed ANFIS model preprocessing FCM clustering model with the amount of root mean square error 0/049 and Coefficient of determination 0/98 in the estimation of aqueducts and with the root mean square value of the coefficient of 0/20 and Coefficient of determination 0/96 on the forecast SUBCLUST model of groundwater level to better results. ANFIS fuzzy neural network method to accurately estimate and forecast water levels of underground aqueducts Dubai is a city of Birjand. So is recommended to estimate the flow fields, the city of Birjand using fuzzy neural network ANFIS be done.

Keywords: Groundwater, Aqueduct, Fuzzy Neural Network, Birjand.

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