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tree used in this study met the criteria. Evaluation = R_2 = 0.83, RMSE = MAE = 0.0019 = MRE and MR = 0.9914 performed better than backup vector machine and neural network (MLP), and sensitivity analysis results using extended artificial neural network model showed that sand percentage The most important factors affecting the saturated hydraulic conductivity of the soil were lime, percent lime and acidity, respectively.

Keywords: Decision Tree, Backup Vector Machine, Neural Network, Fixed Load

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Hydraulic conductivity predicting by artificial intelligence using readily obtainable properties of soil. Case study (Hirmand city)

Abstract

Hydraulic conductivity of soil is one of the important physical properties of soil that is used in modeling of water, solute and pollutant transport. Direct measurement of soil hydraulic conductivity is time consuming and costly and sometimes due to experimental errors and soil uniformity the results are not reliable enough. On the other hand, this parameter can be estimated using early soil parameters. The present study was conducted to predict soil saturated hydraulic conductivity using decision tree methods, support vector machine and artificial neural network (MLP) in the Surface area of Sistan and Baluchestan province. For this purpose, 130 soil samples were collected from the surface (0-30 cm) of the excavated part of Hirmand city and transferred to the laboratory for testing and analysis. Systematic sampling was performed on a systematic grid measuring 1500 × 1500 m. Then, modeling and estimation of hydraulic conductivity of soil saturation was done using soil properties including percent, percentage, percent, organic matter, acidity, electrical conductivity and calcium carbonate using decision tree methods, artificial neural network (MLP) and back-vector machine. Explanation coefficients (R2, RMSE, MAE) and mean ratio (MR) were used to evaluate the models. The results of this study show that the decision