

Prediction of environmental indicators in Agriculture land leveling using artificial intelligence techniques

Isham Alzoub

Department of Agricultural Machinery Engineering,
University of Tehran,
Iran

Abstract

Land leveling is one of the most important steps in soil preparation and cultivation. Although land leveling with machines require considerable amount of energy, it delivers a suitable surface slope with minimal deterioration of the soil and damage to plants and other organisms in the soil. Notwithstanding, researchers during recent years have tried to reduce fossil fuel consumption and its deleterious side effects using new techniques such as; Artificial Neural Network (ANN), Imperialist Competitive Algorithm –ANN (ICA-ANN), and regression and Adaptive Neuro-Fuzzy Inference System (ANFIS) and Sensitivity Analysis that will lead to a noticeable improvement in the environment. In this research effects of various soil properties such as Embankment Volume, Soil Compressibility Factor, Specific Gravity, Moisture Content, Slope, Sand Percent, and Soil Swelling Index in energy consumption were investigated. The study was consisted of 90 samples were collected from 3 different regions. The grid size was set 20 m in 20 m (20*20) from a farmland in Karaj province of Iran. The aim of this work was to determine best linear model Adaptive Neuro-Fuzzy Inference System (ANFIS) and Sensitivity Analysis in order to predict the energy consumption for land leveling. According to the results of Sensitivity Analysis, only three parameters; Density, Soil Compressibility Factor and, Embankment Volume Index had significant effect on fuel consumption. According to the results of regression, only three parameters; Slope, Cut-Fill Volume (V) and, Soil Swelling Index (SSI) had significant effect on energy consumption.



Biography:

Isham Alzoubi currently works at the Department of Agricultural Machinery Engineering, University of Tehran. Isham does research in Analysis, Applied Mathematics and Probability Theory. Their most recent publication is 'Prediction of environmental indicators in land leveling using artificial intelligence techniques'.

Speaker Publications:

1. "Modeling and predict environmental indicators for land leveling using adaptive neuro-fuzzy inference system (ANFIS), and regression"
2. "Effect of Soil properties for Prediction of Energy consumption in Land Leveling Irrigation"
3. "Comparing ANFIS and integrating algorithm models (ICA-ANN, PSO-ANN, and GA-ANN) for prediction of energy consumption for irrigation land leveling"
4. "Integrating artificial neural network and imperialist competitive algorithm (ICA), to predict the energy consumption for land leveling"

[15th Crop Science and Agriculture Summit](#); Webinar- December 09, 2020

Abstract Citation:

Isham Alzoub, Prediction of environmental indicators in land leveling using artificial intelligence techniques, CROPS-AGRI-2020, 15th Crop Science and Agriculture Summit, Webinar, December 09, 2020

<https://crops-agri.foodtechconferences.com/>

