

Title: Smart Spatial Analyses in Land Levelling

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Encyclopedia of Bioanalytical Methods for Bioavailability and Bioequivalence Studies of Pharmaceuticals (E-BABE): It is a unique encyclopedia involving bioanalytical methods for bioavailability and bioequivalence (BA/BE) studies of pharmaceuticals for suitable method selection with thousands of combinations and searches against these methods. Most scrutinized literature was collected from different sources including PubMed. This database has been curetted using published methods for all most all pharmaceuticals. Required information for regular method development/validation such as IUPAC name, structure, solubility, chromatographic conditions, instrumentation information like HPLC, LCMS detection parameters, sample preparations, recovery details, limit of detection and limit of quantification, Tmax, Cmax etc., for routine application in BA/BE studies of pharmaceuticals was incorporated including official pharmacopeias information such as European Pharmacopeia, Japan Pharmacopeia and US Pharmacopeia. Database includes drug based bioanalytical methods covering most required fields and external database links of important drug portals such as drug bank, Rxlist, MEDLINE plus, KEGG Drug ID, KEGG Compound ID, Merck manual, PubChem compound ID, PubChem substance ID and USFDA. Searching/querying the database is through drug name, chemical formula or structural search by smiles format. Keen selections of bioanalytical methods for pharmaceutical analysis or regular quality control are also possible with E-BABE. E-BABE was built understanding the needs of pharmaceutical industry and laboratories including CROs working on BA/BE studies. Presently it has nearly of 5,000 methods and it will be updated regularly. (Up to 250 words) 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. Using adaptive neuro-fuzzy inference system for prediction of labor energy, fuel energy, total machinery cost, and total machinery energy can be successfully demonstrated. In comparison with ANN, all ICA-ANN models had higher accuracy in prediction according to their higher R2 value and lower RMSE value. The performance of the multivariate ICA-ANN and regression and artificial neural network and sensitivity analysis and adaptive neuro-fuzzy inference system (ANFIS) model was evaluated by using statistical index (RMSE, R2). The values of RMSE and R2 derived by ICA-ANN model were, to Labor Energy (0.0146 and 0.9987), Fuel energy (0.0322 and 0.9975), Total Machinery Cost (0.0248 and 0.9963), Total Machinery Energy (0.0161 and 0.9987) respectively, while these parameters for multivariate regression model were, to Labor Energy (0.1394 and 0.9008), Fuel energy (0.1514 and 0.8913), Total Machinery Cost (TMC) (0.1492 and 0.9128), Total Machinery Energy (0.1378 and 0.9103) respectively, while these parameters for ANN model were, to Labor Energy (0.0159 and 0.9990), Fuel energy (0.0206 and 0.9983), Total Machinery Cost (0.0287 and 0.9966), Total Machinery Energy (0.0157 and 0.9990) respectively, while these parameters for sensitivity analysis model were, to Labor Energy (0.1899 and 0.8631), Fuel energy (0.8562 and 0.0206), Total Machinery Cost (0.1946 and 0.8581), Total Machinery Energy (0.1892 and 0.8437) respectively, while these parameters for ANFIS model were, to Labor Energy (0.0159 and 0.9990), Fuel energy (0.0206 and 0.9983), total machinery Cost (0.0287 and 0.9966), total machinery Energy (0.0157 and 0.9990) respectively, Results showed that ICA-ANN with seven neurons in hidden layer had better.

Biography

Isham Alzoub has completed his PhD at the age of 27 years from Tehran University and studies from Doctor of Philosophy degree in agricultural Mechanization Engineering (University of Tehran – Iran) and he has completed his postdoctoral studies at the age of 40 years from School of Surveying Geospatial Engineering Department of Surveying and Geomatics Engineering, University of Tehran – Iran. Currently working as a General comission for scientific A gricultural Researh – Damascus – Syria (Mechanical Engineer). He has published more than 16 papers in reputed journals and has been serving as an editorial board member of repute.

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