عنوان مقاله:

COMPARING FUZZY METHOD WITH PARAMETRIC APPROACHE IN LAND SUITABILITY FOR BARLEY IN MAHYAR PLAIN OF ISFAHAN PROVINCE, IRAN

محل انتشار:

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خلاصه مقاله:

Land evaluation is a process of assessment of land performance when used for specified purposes. In other words, Land Evaluation is the estimation of the possible behavior of the land when used for a particular purpose. In classical set theory, membership in a set or a class is crisp and defined only as either non-complete or complete but in the fuzzy set theory, membership in a set or a class can range from non-complete to complete.Fuzzy sets proposed by Zadeh(1965)are a generalization of classic logic. In fuzzy thinking, determination of specific border is difficult and belonging of various elements to various concepts and issues are relative (Tang et al., 1991).In this research parametric method was compared with fuzzy method through comparison of: a) regression coefficient of land index with observed yield. b) the predicted yield with observed yield .This study aims to determine the qualitative land suitability evaluation using fuzzy set theory and compare with parametric for barely in Mahyar plain of Isfahan province.Results showed that, The coefficient of determination (R2) between land indices and observed yield using fuzzy and parametric methods are0.83 and 0.65.MATERIALS AND METHODS The region covers 11000 hectares and is located in the Mahyar plain part of the Esfahan province, center of Iran, within coordinate of latitude 32˚ 25´ and 30˚ 15´ N and longitude 51˚ 51´ and 51˚40´ E . In the present study, soil parameters, such as soil Texture(%Clay,%Sand,%Gravel) , ground water depth, Electrical Conductivity(EC) ,Exchangeable Sodium Percentage (ESP),Gypsum (%), CaCO3 (%),Topography and pH values .Climatic requirements and soil characteristics for crop was determined based on fuzzy and parametric .The degree of membership were put in characteristic matrix and Artificial Neural Network used then output data were put in weights matrix then land suitability matrix was calculated. Finally classes of land suitability have provided for each soil unit.RESULTS AND DISCUSSION In This study, results indicated the coefficient of determination (R2) between land indices and observed yield using fuzzy method and parametric 0.83, 0.65.The qualitative land suitability in the fuzzy approach compared to parametric has been having a higher class. Result showed that the fuzzy method considered the continual land changes and is more efficient in reflecting spatial variability of soil characteristic rather than Boolean's two-valued logic.

کلمات کلیدی:

Land suitability, fuzzy method, parametric, Artificial Neural Network, barely