

A Comparison of Fuzzy Membership Kriging and Indicator Kriging for Predicting Land Suitability

M.Mokarram^{*}, S. Hamzeh², H.Bartholomeus³ M.Shaygan⁴

¹*Dept. of Geography, University of Isfahan, Iran, Email: m.mokarram.313@gmail.com. Tel: +989178020115*

²*Dept. of Irrigation and Drainage, Shahid chamran University of Ahvaz, Iran, Email: saeidhamzeh@gmail.com*

³*Centre for Geo-Information, Wageningen University, The Netherlands, Email:harm.bartholomeus @wur.nl*

⁴*Dept. of Remote Sensing and GIS, University of Khajenasir, Iran, Emailmehranshaygan@gmail.com*

ABSTRACT

Predicting land suitability is an important prerequisite for estimating and mapping unknown land suitability values. Fuzzy spatial prediction techniques are suitable to determine areas where our observations are imprecise and vague. One of the techniques for this purpose is fuzzy membership kriging with a semi-statistical membership function. The implementation of fuzzy membership kriging extracts semi-statistical membership functions from data, and applies these functions to an indicator kriging model. In this study, we use fuzzy membership kriging and indicator kriging to predict land suitability based on nine characteristics including topography, wetness, salinity (EC), alkalinity (ESP), soil texture, soil depth, CaCO₃, pH (H₂O) and Gypsum for the Shavur plain, in southwest of Iran. Results showed that fuzzy membership kriging reduces the estimated error compared to the indicator kriging. This study indicates that fuzzy membership kriging has a higher estimated accuracy than indicator kriging for modeling an uncertainty in the prediction process of land suitability data.

Keywords: land suitability, fuzzy membership kriging, indicator kriging