Feature selection for land suitability evaluation in combination with the fuzzy-AHP method

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1. Introduction

Land suitability evaluation is an important tool to achieve sustainable land use but this approach demands some time-consuming and costly practices. One of the most suggested techniques to reduce these practices is feature selection. Feature selection is an effective method to reduce the dimensionality of data and involves searching for possible combinations of attributes to find which subset of features gives the best results. The purpose of this study is to determine the most efficient method for feature selection and the most important factors to determine land suitability.

2. Method

2.1. Study area:
The study area, the Shavur plain, is located in the Khuzestan province in the southwest of Iran, between latitudes 31° 00' 30" N- 32° 30' 00"N and longitudes 48° 15' 00"E- 48° 40'40" E with an area of 774 km². Data used for this case study are: Topography, wetness, EC, ESP, Texture, depth, CaCo3, pH and Gypsum in 256 points. The procedure of is summarised in the following flow diagram.

![Flow diagram for main steps of this study](Fig 1)

3. Discussion:

Results show that there is a Strong agreement between fuzzy-AHP and the results obtraine with feature selection methods. The Random search is slightly better than other methods. Soil texture, EC and ESP parameters were used in Random search method, of which EC and Texture are selected by all feature selection methods. Therefore, it is concluded that these parameters are most effective parameters for land suitability analysis. Therefore, it is advised to use the most effective parameters to reduce the time and costs for land suitability evaluation for barley in comparable areas.

4. References:
