# Comparison of AHP and FAO Methods for Land Suitability Evaluation of Rainfed Wheat in Kuhin Area

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**Abstract**

Land utilization has tremendously increased as a result of growing population. Therefore, it is necessary to utilize lands according to their potential to increase their productivity and sustainability. As assessing the land suitability is a multifactorial issue, it needs a special technique to assess all the factors simultaneously. In this way, multi-criteria decision making methods (such as Analytic Hierarchy Process) are widely used. In this study, AHP and FAO methods of land suitability evaluation for rainfed wheat were compared for some lands in Kuhin area. Based on the study of 23 soil profiles, 1/40000 aerial photo interpretation of the region, and taking into account the characteristics of soil morphology, 16 soil units (land units) were determined in the area and land evaluation was performed on these units. Nine criteria including: %$CaCo_3$, %OC, %gravel, soil depth, texture, apparent CEC, pH, %slope, and climate (precipitation of the growing season, monthly rainfall, vegetative stage, mean temperature of the growing season, and mean temperature of the vegetative stage) were selected. Then, these criteria were compared in terms of decision matrix. Comparison of AHP and FAO land indices showed that AHP index for all land units was much more than that of FAO. Maximum and minimum calculated land indices were 72.5 (land unit 5) and 48.52 (unit 11), respectively. The correlation coefficients between land index and observed yield in the study area for AHP method and FAO method were 0.858 and 0.739, respectively.

**Keywords:** Land index, Aerial photo, Correlation

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