

## **Abstract**

Rangelands in comparison to other renewable resources are extremely vulnerable to destruction during 3 last decades, so paying closer attention to managing, improving and restoring rangelands, more than ever seems necessary. The purpose of this study is to modeling the location of seeding and fertilizing in areas with the potential to be used as pasture using in geographical information system in the Onarchay watershed of MeshginShahr. To this end, first the effective factors involved in the selection of suitable areas for the implementation of each of the mentioned operation were determined.

Based on selected factors, a questionnaire was designed as paired matrix for each operation. After explaining the purposes and methods of the study, local experts were asked to give an appropriate weight for each criterion. Then this comparison matrix was given to Expert Choice software and weighted. In the next step, the required layers of digital information were prepared and data were collected in accordance with project requirements. Other layers, climate, physiography, soil properties maps and vegetation, were standardized in the GIS environment using fuzzy logic. Therefore, the fuzzy membership functions of each were obtained and all of the layers were made fuzzy, in ArcGIS10 environment, using these functions, and then weighted using Analytic Hierarchy Process (AHP). Finally, by the integration of data layers in ArcGIS 10 environment and in analytic hierarchy process (AHP) model and by using fuzzy membership functions, the map of suitable sites for each of the modification projects were obtained separately and marked on the area map, and then the obtained maps were classified based on the weight of the final layer. The results showed that the pasture situation, the average annual temperature, gravelly coverage and acidity are of the most important factors in locating seeding rangeland project and ecological factors of combined vegetation, mean annual precipitation, soil organic matter and acidity are of the most important ecological factors contributing to the fertilizing project.

The results also indicated that in both projects, 47.6% of the total project is unsuitable for both modification programs. Also 13% of the total project area for fertilizing and 26% of the total area for seeding project are of excellent class. After mapping suitable areas for each of the modification actions validating of the model was done through the field inspection. Accuracy of the result for the defined projects was calculated as 87% for fertilizing and 80% for seeding projects. The results showed that the use of AHP and fuzzy logic in GIS, due to easy access and prioritization in decision-making zoning maps, give more choice to the managers in determining the appropriate location for seeding and fertilizing.

**Keywords:** Locating, Seeding, Geographic Information System, Analytical Hierarchy Process, Fuzzy Logic, Fertilizing



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