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Application of Geographic Information System (GIS) for developing range improvement and reclamation plans in Taleghan summer pastures

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Introduction Iran has 90 million hectare in pastures. To manage and develop programs for the renewable resources requires a suitable and rapid method for collecting and analyzing the information. Geographic Information System (GIS) can perform an important role in this process. The program for improving and growing pastures is one of the best plans to obtain the goal of optimum pasture management. The main purpose of this investigation was to examine the capability of GIS in managing the environmental units and range improvement sites, and finally to produce a range management plan and model for a specific area.

Material and methods GIS has high capability in details and resolution and also incorporation of the local data. In this research, some basic data such as slope, elevation, vegetation, soil depth and texture, range trend and condition were collected and mapped using GIS. Different layers of aforementioned information were integrated together in a GIS environment, and the uniform units were produced. Then in accordance to the traits of each unit and with the basic consideration of the vital rules of pasture models, the management model was presented for improving pastures situation or stability at the current optimum state in the study area. The management needs such as grazing system, reseeding and exclosures were specified and scheduled for the study area.

Results and discussion Result of this study, which was performed in Taleghan summer pastures, is shown in (Figure 1). In accordance with (Figure 1) the total area of rangeland which should be managed by the natural method is 780 ha (code 1), the area to be managed by the balance method is 1010 ha (code 2), the area to be manured is 565 ha (code 3), the area to be in an enclosure is 612 ha (code 4), the area to be interseeded is 485 ha (code 5), the area to be hoe sowed is 280 ha (code 6), the area to be seeded is 785 ha (code 7), and the rest is rocky, river and farmland and residential areas (Figure 1).

Conclusions The study shows the area has a great potential for improvement and GIS is a useful tool for analyzing the needs. Combining information layers offers a method to rapidly locate and design pasture management. The GIS integrated model for rangeland management could help us to achieve the information more conveniently and quickly. Clarification is another attribute of this model. It has to be noted that for large-scale planning, some additional data such as climatological, geological, isotherm and isohytl data may be needed. Azarnivand et al (2007) reported similar results.

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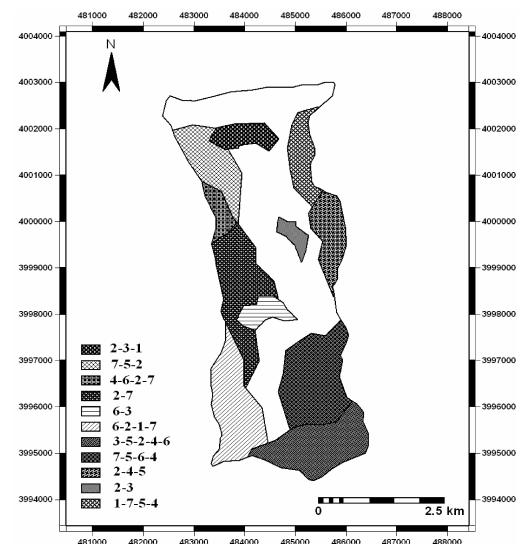


Figure 1 Proposed reclamation plans by using GIS.