

Biodiversity - 2015: Water and forage assessment for livestock grazing

Hosein Arzani, Ismaeil Alizadeh, Fazel Amiri, Akbar Javadi, Mehdi Biniaz, Hosein Shams and Mohammad Jankju

University of Tehran, Iran, Email: harzani@ut.ac.ir

Abstract

This paper follows FAO model of suitability analysis. Influential factors affecting extensive grazing are determined and converted into a model. 6 different regions with different climate and features in Iran were examined for common types of grazing animals and advantages and limitations were elicited. All range ecosystems' components affect range suitability but due to the time and money restrictions, the most important and feasible elements were investigated. From which three sub models including water accessibility, forage production and erosion sensitivity were considered. Suitable areas in four levels of suitability were calculated using GIS. This suitability modeling approach was adopted due to its simplicity and the minimal time that is required for transforming and analyzing the datasets. Managers could be benefited from the model to devise the measures more wisely to cope with the limitations and enhance the rangelands health and condition.

Rangelands have different functions like forage and by-products supply, wildlife habitat function, regulative function, recreation, non-use / Intangible values including preservation of endangered species and anthropological sites. These different types of land-use are often mentioned as multiple-use (Heady & Dennis Child, 1994). Meanwhile, allocation of limited rangeland resources to various land uses, lack of sufficient environmental policies for sustainable use of rangelands as well as degradation of these areas

have caused increasing concern among managers and revealed the importance of land suitability analysis (Jafari & Zaredar, 2010). Combining land and land use in a land evaluation procedure gives land suitability, defined as the fitness of a land unit for a land use type which is assessed by comparing land use requirements of each land utilization type with land (FAO, 1991). Land suitability analysis is one of the most important tools in making locational and siting decisions as a part of planning studies (Ricketts et al., 2004). Broadly defined, land-use suitability analysis aims at identifying the most appropriate spatial pattern for future land uses according to specify requirements, preferences, or predictors of some activities.

In this study, rangeland suitability for extensive grazing was considered as one of the most rampant uses of rangelands. Assessing suitability for grazing not only decreases the risk of degradation but also could open a space for debating other usages of rangeland for range managers. In most of the cases studied, the criteria for rangeland suitability assumed for livestock grazing are categorized into 3 sub-models of forage production, water (accessibility, quantity and quality) and soil erosion vulnerability (Arzani et al., 2006; Javadi et al., 2008; Amiri, 2008, 2009). Ayoubi and Alizadeh (2006) evaluated range suitability for livestock grazing qualitatively (plant access to moisture, saltiness and the amount of sodium, physical hampers against root expansion, range accessibility and water accessibility) and found that slope, moisture

accessibility, outcrops and water accessibility were the limiting factors. Dvaran et al. (2009) analyzed goat production suitability in Turkey and explain that erosion, destruction of shoots and branches and forest degradation are the most important limiting factors. Javadi et al. (2008) assessed rangeland suitability for camel grazing and found that water accessibility, severe erosion and low forage production as the most effective factors on suitability. Arzani et al. (2006) studied sheep grazing suitability in four regions and found that slope, water accessibility and erosion mostly affected range suitability within these regions. Oberlie and Bishop (2009) presented a model for cattle grazing suitability, including slope and water remoteness as the important factors.

benefit.

This study is about to define influential factors on rangeland suitability for extensive grazing, proposing a model, and classifying rangelands suitability and finally define declining and limiting factors for extensive grazing. In this study which covers a wide climatic area, topographic and geographic conditions, a model for range suitability assessment for extensive grazing of sheep as dominated grazing animal in Iran was elicited. Three limiting conditions for extensive grazing according to FAO (1991) have been taken into account as pointed out. In this study different limitations and opportunities for extensive grazing were examined. Meanwhile, we represented a comprehensive attitude towards extensive grazing, but one should know that grazing is one of the uses readily available for rangelands. As FAO (1991) argues, different land units have different qualities for certain utilizations. As might be understood, rangelands' utilizations comprise certain qualities and criteria that the model prepared to assess suitability, must consider. Moreover, multiple uses could be substituted with single utilization in order to gain sustainability in resources and gain ultimate but sustainable

This work is partly presented at [4th International Conference on Biodiversity](#) June 15-17, 2015 Las Vegas, USA

4th International Conference on Biodiversity
June 15-17, 2015 Las Vegas, USA