PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY

BIENNIAL CONFERENCE

Official publication of The Australian Rangeland Society

Form of Reference

The reference for this article should be in this general form:

Author family name, initials (year). Title. In: Proceedings of the nth Australian Rangeland Society Biennial Conference. Pages. (Australian Rangeland Society: Australia).

For example:

Anderson, L., van Klinken, R. D., and Shepherd, D. (2008). Aerially surveying Mesquite (Prosopis spp.) in the Pilbara. In: 'A Climate of Change in the Rangelands. Proceedings of the 15th Australian Rangeland Society Biennial Conference'. (Ed. D. Orr) 4 pages. (Australian Rangeland Society: Australia).

Disclaimer

The Australian Rangeland Society and Editors cannot be held responsible for errors or any consequences arising from the use of information obtained in this article or in the Proceedings of the Australian Rangeland Society Biennial Conferences. The views and opinions expressed do not necessarily reflect those of the Australian Rangeland Society and Editors, neither does the publication of advertisements constitute any endorsement by the Australian Rangeland Society and Editors of the products.

The Australian Rangeland Society

Locating the projects of improvement and production of the pasture using GIS (Case studies of Bande Ghora watershed In Kashmar)

Reyhane Azimi1, Morteza Rezayi2, Katayon Kazempor3

Faculty of Natural Resources and Environment, Ferdowsi University OF Mashhad, Iran

Abstract

Mainly, pastures of Iran are located in arid and semiarid regions. But according to local meteorological studies, Band Ghora in Kashmar has semi-arid and cold climate. 3 to 4 times utilization of the grazing capacity of the pastures in this basin is based on the type and percentage of of vegetation, slope and distance from water sources which led to the destruction of the pasture. The aim of the study is improving the rangelands (Desertified Rangelands or destroyed pastures), locating and upgrading the existing conditions with regard to the capabilities and limitations and relying on the existing state of the pastures, for improvement and reclaim operations such as: seeding, wet seeding, and grazing management using GIS techniques. Using topographic maps 1:50000, digital maps1:25000, images derived from Google Earth software as well as field visits of the region, pasture land area was separated from other users. After that, the gradient maps, floor height, susceptibility to erosion, the rainfall, vegetation type and size and biological map of the region(bio-region) was prepared by putting digital maps in the software Arc Map, ArcView environment, the locate map of the suitable projects for improving pastures obtained. The result of the locate model of Kashmar's Bande Ghora, represents approximately 12.12 square kilometers (23.94 percent) of the surface area of the project of saw(ing), 2.7 kilometers (5.3 percent) of the project of seeding and 31.1 square kilometers (61.44 percent) of grazed watershed management project, is appropriate.

Key words: Arc Map, Arc View, locating the improved pasture project, seeding, saw, grazing management, Bande Ghora in Kashmar

Introduction

Locating the project for rangeland improvement is an essential step. integration of data by GIS as a proper tool for this purpose. Based on this procedure collection and analysis of data is carried out and finally GIS maps are prepared and gaps are found for allocation of the projects(1) Evaluation of land use suitability and potentials is a complex is issue which requires consideration of several environmental parameters(2). Today remote sensing and GIS are effective tools for evaluate and determinate of the ecologic potential of natural recourse particularly rangelands. Although rangelands cover a vast area in Iran with 100 million hectares of natural vegetation with different degree of conditions data analysis based on GIS maps have not been carried out in detail. The purpose of the present study was to evaluate the rangeland condition of Bande Ghora watershed in kashmar, Iran by the arid of GIS mapping for allocation of rangeland projects.

Material and methods

The area of Bande Ghora watershed is located in the western parts of Kashmar with an area of 50 Km^2. (longitude 58 11 38 to 5818 26 North) and latitude 35 27 58 to 35 32 18 East. Mean altitude of the area is 1779 m with a maximum of 2521 m and a minimum of 1417 m and a mean annual rainfall of 300 mm with a cold semi-arid climatic condition. Physiographic features of the watershed and sub watersheds was evaluated with ETM

satellite pictures and 1/20000 area photographs. Topographic maps (1/50000), digital map (1/25000) images derived for Google Earth software were also used. The gradient maps, floor height, susceptibility to erosion, rainfall, vegetation type and size and biological maps were prepared by putting digital maps in the Arc Map, Arc View environment and finally the location map suitable projects for improving rangelands was obtained.
Plant cover criteria of the area was evaluated on the bases of the present procedure available in the normal rangeland textbook.

Results and discussion
In table 1 Soil cover and plant types specification including cover and product indices and also rangeland condition and trend is shows.

Table 1- Plant types specification product indices and rangeland condition and trend

			Cover				Available forage (Kg/ha)	Carrying capacity	Total yield
Type	Plant Type	Area (ha)	Plant Cover	Litter	Gravel	Bare soil			
I	Ar.au-Sc.or	466/1	26	2	53	19	82	637	38223/48
II	Ar.au-Sc.or-Co.er	1717/3	19	2	45/0	34	73/6	2107	126393/28
III	Gu.to-Sc.or-On.co	241	15	2/5	38/5	44	61/2	246	14750/42
IV	Sc.or-Gu.to-Ar.au	610/4	17/5	1/5	52	29	68/4	696	41748/62
Total		3034/8						**3685**	**81/221115**

The dominate special for the 4 plant types recognized (Ar.au-Sc.or), (Ar.au-Sc.or-Co.er) were Lactuca, Acanthophyllum, Astragalus, and annual grasses. However due to a poor condition of the rangeland in the area invasive species such as Peganum hermala and other unpalatable species were prudent. Rangeland Was negative for most of the plant types. Based on the evaluation of made on the productivity, condition and trend of the rangeland in the area improvement strategies such as seeding, planting and exclusion of grazing was recommended (maps 2 , 3 , 4) and finally these procedures were integrated in the map 5 for allocation of the project for improvement of the rangelands in the area. Plant species recommended for seeding and planting were Artemisia aucheri, Medicago sativa, Agropyron desertrum, Onobrychis sativa, Erotia ceratoides, Kochia prosterata

References

1- Alavipenal-S.kazem.2003.Application of remote bsensing in earth sciences (soil) . Tehran University.
2- Earl, R., G. Thoman, and B.S. Blackmore. 2000. The potential role of GIS in autonomous field operation. Computer and Electronics in Agriculture, 25: 107-120.
3- Goddard, T.W., G. Lachapelle, and T.c. Martin. 2001. The future of GIS and

GPS in agriculture. National Conference on Pesticide Application Technology August 10 and 11, Guelph, Ontario.
4- Gonzalez, R.M. 2002. Joint learning with GIS: multi-actor resource management. Agricultural System, 73: 99-111.
5- Grundy, A.C., C. M. Onyango, K. Phelps, R.J.Reader, J.A. Marchant, L.R. Benjamin, and A. Mead. 2005. Using a competition model to quantify the optimal trade-off between machine vision capability and weed removal effectiveness. Weed Research, 45: 388-405.
6- Okamoto, H., T. Murata, T. Kataoka, and S.I. Hata. 2007. Plant classification for weed detection using hyperspectral imaging with wanelet analysis. Weed Biology and Management, 7: 31-37.
7- Shaw, D.R. 2005. Translation of remote sensing into weed management decisions. Weed Science, 53: 264-273.