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**Review and Short Length Article:**

## **The Landscape as a Unit for Rangeland Inventory in Arid and Semi-arid Regions of Iran**

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**Abstract.** Severe range degradation was critically extended in many region of Iran and caused many rangelands were restricted and interwoven with croplands in a complex system. Therefore, rangeland planning and inventory as an isolated activity has become almost impossible. Current landscape planning involves contributions of different social organizations often with different interests and with different desired outcomes. In this study, landscape is considered as a management unit. I have proposed an integrated model based on traditional pastoralism which will facilitate sustainable land use of natural resources in future. Combining the benefits of different rural groups is the most important part of our decision making plan which provides solution to the problems of non-dependency of villagers to the rangelands. Formation of research work group from urban specialists and rural skilled workers with cooperation of international organization are the keys of preparation the integrated projects.

**Key words:** Cultural ecology, Endemic knowledge, Traditional rangeland boundary, Sustainability

## Introduction

Severe land fragmentation, degradation, and pollution problems will urge us to think about a rural community and research work group in Iran to combine our experiences and skills to deal with the challenges of improving land use sustainability (Bosch *et al.* 1995, Mesdaghi, 1993). Planning rangeland inventory requires recognition of the ecological processes operating at different scales and their particular characteristics (Friedel and Laycock, 1995; Mesdaghi, 1995).

In ancient countries like Iran (Persia), past land use suggests that rangelands use by local herders were being co-adapted with natural environments (Nyerges, 1980, Mesdaghi, 1993). Rangelands, however, were nationalized through the land reforming, so private range properties were rejected. However, the government failed to properly manage the rangelands. Local people tried to make properties inside nationalized rangelands, and the rangelands were converted to dry lands (Mesdaghi, 1993). The results of these interventions were the heterogeneity of landscape and both rangelands and dry lands were interwoven in nested complex systems. Therefore, rangeland inventory as an isolated activity is almost meaningless. Meanwhile, current landscape planning involves contributions from many different social organizations often with different interests and with different desired outcomes (Mesdaghi, 1995). Tazeh (2016) proposed landscape metrics analysis in degraded rangelands with increasing the number of patches in arid lands of Yazd province, Iran.

In this research based on the evaluation of case studies in arid and semi-arid regions of Iran (FAO, 1971; Spooner and Horne, 1980) an integrated model was proposed.

## Methodology

A definition of landscape based on traditional pastoral practices reveals the importance of cultural and ecological perspectives of past land usage (Spooner and Horne 1980). I have proposed an integrated model that includes various levels of management, the need of social organizations, potential rangeland classes, and agro-ecological-based dry land farming. Case studies were selected from two locations in arid rangelands (Touran Biosphere Reserve, in Samnan Province, 1970's) and semi-arid rangelands (Behkadey Raji, North Khorasan Province, 1975-1980). Touran Biosphere reserve was a mutual cooperation programme between the Organization Environmental Conservation and University of Pennsylvania, USA. Based on the proposal of PhD students, some articles published by University of Pennsylvania (e.g. Spooner and Horne, 1980; Nyerges, 1980). These articles were translated by Mesdaghi (1993). Raji- Niya project was a part of France Aids Programme for recovered leprous of Leprosy Centre of Khorasan Razavi Province. The programme includes establishment of rural building, modern gardens and animal husbandry, water resource conservation, etc. The project was quiet onset of Iran' revolution in 1979.

In each study area, the following steps of range inventories were planned:

**Step1.** Documents of range properties were provided from Forest and Range Organization and the Bureau of Property and Documents Registrations. A map of rangelands before land reforming in 1965 was provided through old layouts and compared with new maps of recent range use.

**Step2.** Gathering data by interviewing local people on land use in past and present.

**Step3.** Different land users were considered in planning landscape as a management unit.

**Step4.** An integrated model includes various levels of management, the necessity for social organizations, potential rangeland classes, and agro-ecological-based dry lands farming was proposed with references to the case studies.

**Expected Results**

By comparing the past and present land use, integrated models were prepared based on four scales of 1:20,000, 1:25,000, 1:50,000, and 1:100,000 (Table 1). An integrated model of 1:50,000 scale will be provided which shows the

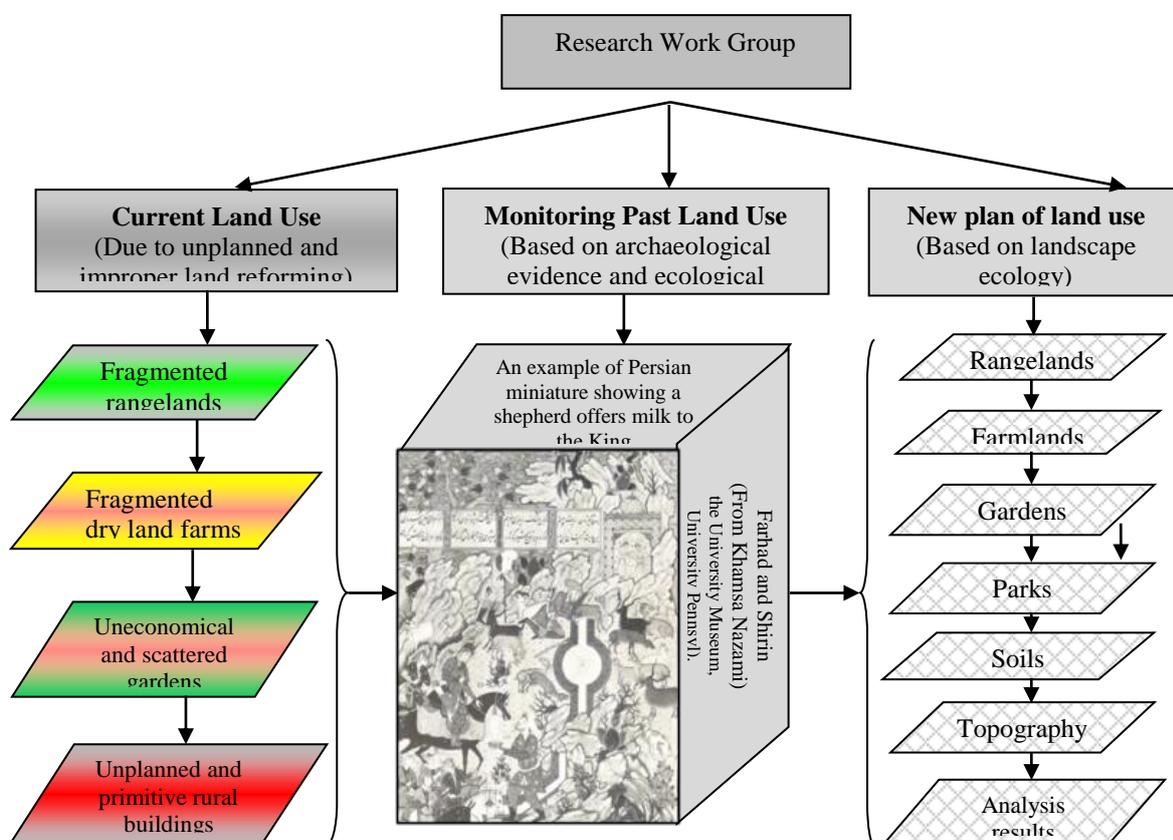
features of land use in past and present (Fig. 1).

The following items will be considered in the new model:

1. Transferring nationalized rangelands to the herders based on a logic long-term rental criteria,
2. Combining fragmented cultivated crop lands to cooperative sharing systems,
3. Developing and sharing the knowledge of different beneficial groups (stockholders),
4. To improve our knowledge for development a comprehensive rangeland inventory by recommendations of land use specialists of other countries.

**Table 1.** Level and scale of rangeland planning in Iran

Kind of plan	Planning Unite	Scale	Area (Ha.)	Vegetation level
Comprehensive	Marteh (Rangeland)	1:100,000	>100,000	Vegetation type
Semi-detailed	Charagah (Pasture)	1:50,000	>5,000	Community type
Detailed	Yourt (Unit)	1:25,000	<5,000	Community type
Detailed	Deh (Village)	1:20,000	<2000	Converted veg.
Detailed	National park & Protected areas	1:20,000	variable	Climax veg.



**Fig. 1** Integrated model of land use based on ecological passed land use and modern designs of landscape as unit for planning which will be provided by research work group (adapted from Spooner and Horne, 1980)

Historical aspect of range inventory and monitoring is presented in Table 2.

**Table 2.** Historical aspects of rangeland inventory and monitoring in Iran

Method	Presented (Person/Org.*)	Objective	Executive organization	Scope (scale)	Qual./Quan.
Range grading	UNDP (1950)	Determination of condition and capacity	Range and Fodder organization	Traditional Boundary (1:20,000)	Qualitative
Adjusted range grading	Technical Range Bureau	condition and capacity (rainfall based)	Forest and range dept. (provinces)	Small range plans (1:25,000)	Qualitative
6-Factor method	FAO (1971) (D.L. Goodwin)	Range condition classification	FAO	Small range plans 1:50,000	Quantitative
Climax method	Adapted from Dyksterhuis (1949)	Range condition classification	Technical Range Bureau	Small range plans 1:50,000	Quantitative/Qualitative
Satellite classification	FMC (USA)	Estimation range production	Ministry of Natural Resources	National level (1:1,000,000)	Quantitative
Inventory planning	Mesdaghi (1993, 1995)	Range Use planning	?	National level (1:1,000,000)	Quantitative/Qualitative
Landscape function analysis	Tongway and Hindley (2005)	Sustainable Range use	CSIRO (Australia)	Small scale range management plans (up to 1:50,000)	Quantitative/Qualitative

\* Organization

### Conclusion

Our monitoring of the past land use, suggests that the use of rangelands by local herders was being co-adapted with natural environments. We have proposed an integrated model that includes various levels of management, needs of social organizations, potential rangeland classes, and agro-ecological-based dry land farming. The main advantage of planning based on landscape unit is that by consideration of ecological aspects of past use and present features of land use, integrated models can be provided based on land suitability. Combining the benefits of different rural groups is the most important part of such decision making which provides solution to the problems of non-dependency of villagers to the rangeland as Badripour *et. al.* (2016) emphasized on them.

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## «چشم انداز» به عنوان واحد مدیریت اراضی مرتعی در نواحی خشک و نیمه خشک ایران

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**چکیده.** تخریب و انهدام اراضی مرتعی در حد خطرناکی گسترش یافته است به طوری که در بسیاری از مناطق، مراتع در حاشیه اراضی زراعی قرار گرفته و سطوح باقی مانده مراتع آنچنان با دیمزارها درهم تنیده که تقریباً تفکیک آنها از یکدیگر غیر ممکن است. بنابراین دیدگاه مدیریت مرتع بر اساس تهیه و اجرای طرح‌های مرتعداری به عنوان یک فعالیت مجزا مفهوم کاربردی خود را از دست داده است. در این مقاله «چشم انداز» به عنوان «واحد مدیریت» اراضی تعیین شده است که با ارائه مدل تلفیقی بر اساس سامان‌های عرفی، بهره‌داری پایدار از منابع طبیعی تجدید شونده میسر می‌گردد. ترکیب منافع گروه‌های مختلف روستایی مهمترین بخش طرح تصمیم‌گیری است که برای رفع اتکاً کامل روستاییان از مرتع راه کارهایی را مهیا می‌کند. تشکیل گروه‌های کار از متخصصان جامعه شهری و کارگران ماهر جامعه روستایی همراه با همکاری سازمان‌های بین‌المللی کلید تهیه پروژه‌های جامع است.

**کلمات کلیدی:** بوم‌شناسی فرهنگی، دانش بوم، سامان عرفی، پایداری