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## **The landscape as a unit for rangeland inventory in arid and semi-arid regions of Iran (Case studies: Touran Biosphere Reserve and Behkadaye Rajinia Development Project)**

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### **Introduction**

Severe land fragmentation, degradation, and pollution problems will force us to think about a rural community and research 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 requiring recognition of the ecological processes operating at different scales and their particular characteristics (Friedel and Laycock, 1995).

In ancient countries like Persia (Iran), past land use suggests that rangelands exploitation by local herders was co-adapted with natural environments (Nyerges, 1980; Mesdaghi, 1993). Iranian rangelands, however, were nationalized through the land reforming and the modernization of rural communities, so private range properties were rejected. But, 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).

In this research two study areas of arid and semi-arid regions were selected which have been studied intensively before and after land reforming ( in 1974 under FAO Aid Development Projects) and Joint French and Iranian Project for Lepers (FAO, 1971, Spooner and Horne, 1980).

### **Materials and Methods**

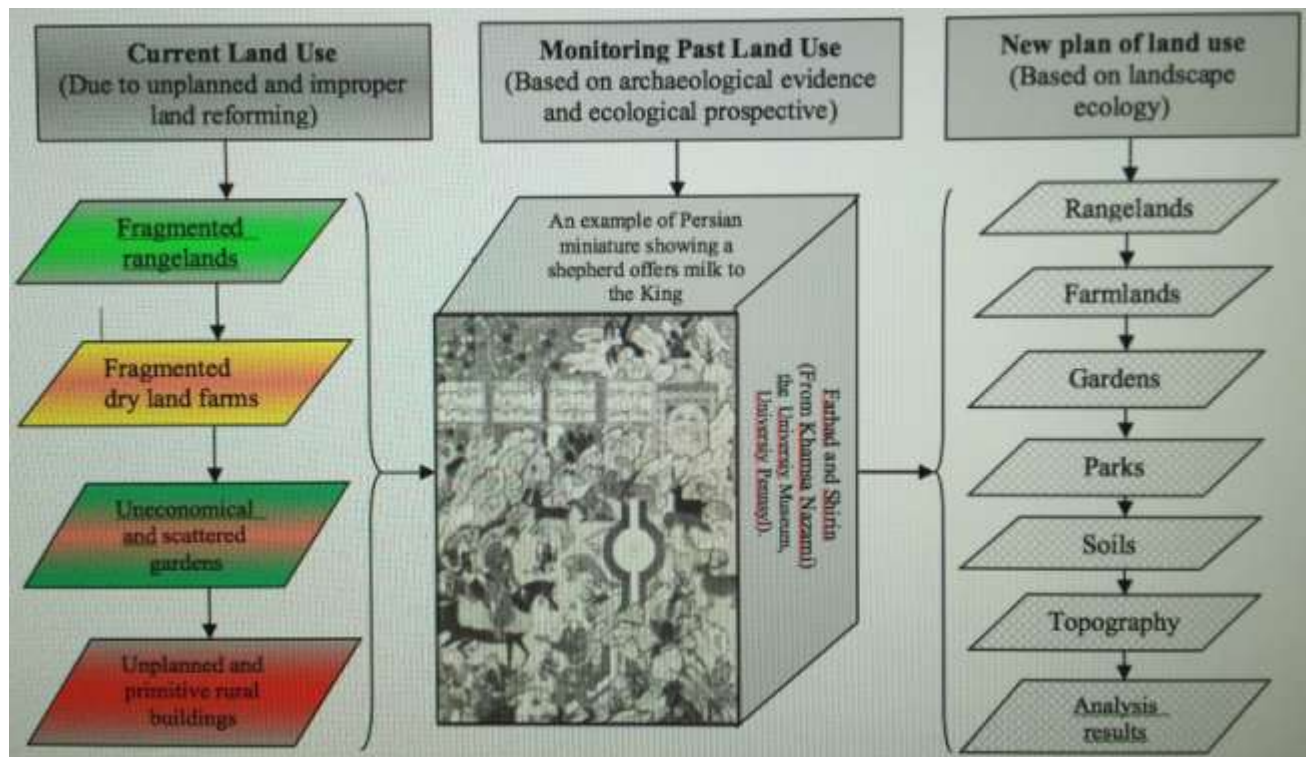
A definition of landscape based on traditional pastoral practices reveals the importance of cultural and ecological perspectives of past land use (Spooner and Horne,1980). I have proposed an integrated model includes various levels of management, the need of social organizations, potential rangeland classes, and agro-ecological-based dry land farming. Case studies were selected from two locations of arid rangelands (Touran Biosphere Reserve, in Samnan Province, 1970's) and semi-arid rangelands (BehkadeyRaji, North Khorasan Province, 1975-1980). 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 organization land users were considered in planning landscape as a management unit. **Step4.** An integrated model includes various levels of management, the needs of social organizations, potential rangeland classes, and agro-ecological-based dry lands farming was proposed with references to the case studies.

### **Results and Discussion**

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 (Figure 1).

The following items will be considered in new model:

1. Transferring nationalized rangelands to herder 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
4. To improve our knowledge for development a comprehensive rangeland inventory by recommendations of land use specialists of other countries. Historical aspect of range inventory and monitoring is presented in Table 2.



**Figure 1** Integrated model of land use based on ecological passed land use and modern designs of landscape as unit for planning.

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

Kind of plan	Planning Unite	Scale	Area (Ha.)	Vegetation level
Comprehensive	Marteh	1:100,000	>100,000	vegetation type
Semi-detailed	Charagah	1:50,000	>5,000	community type
detailed	Yourt	1:25,000	<5,000	community type
detailed	Deh-Dashet	1:20,000	<2000	degraded veg.
detailed	National Park & protected areas	1;20,000	variable	Climax veg.

**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 org.	Private Saman (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

## Conclusion

Our monitoring the past land use suggests that the use of rangelands by local herders was co-adapted with natural environments. We have proposed an integrated model 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 considering ecological aspects of past use and present features and land use, integrated models can be provided based on land suitability. Combining the benefits of different rural groups is the most important parts of decision making.

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