

BOOK REVIEW

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Book review: *Rangeland Ecology, Management and Conservation Benefits*

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Book details

Squires, Victor R. (Editor)
(Environmental Research Advances)
Rangeland Ecology, Management and Conservation Benefits.
Nova Science Publishers, Inc., New York; 2015.
Hardcover, 201 pages; ISBN: 978-1-63482-504-7

Keywords: Rangeland ecology, Rangeland management, Conservation

There is often conflict in commercial/subsistence land use and conservation in rangelands. This book endeavours to build a bridge on this topic by presenting principles, case studies and predictions across many rangeland types. It addresses the critical relationships between technical approaches to rangeland management and their interaction with the socio-economic and socio-political processes. There is clear identification of the changing pressures on rangelands - particularly the competing demands and multiple land use.

The book is in three parts: (1) Rangeland Ecology: The Underpinnings (chapters 1 to 3), (2) Rangeland Management in Practice (chapters 4 to 7) and (3) Capturing the Conservation Benefits of Better Rangeland Management (chapters 8 to 10).

Chapter 1 highlights the importance of sustainability: which 'involves the complex interactions of biological, physical and socio-economic factors and requires a comprehensive approach ... in order to improve existing systems and develop new ones ...'. It is noted that, while 'sustainability' can be defined in theory, its application is more difficult. In this context, setting a goal for 'more adaptable and sustainable ways of living for the rangeland societies' is proposed. This includes identifying participants, policies and procedures which can contribute to sustainability. Following this, the concepts of inter-generational equity and land stewardship are discussed. At the site level, the necessity of recognising the impact

of management on the interactions within ecosystems as well as beyond their boundaries ('off-site') is paramount.

The significance of planning involving much more than biology is profiled in chapter 2. There is criticism of bureaucrats who consider that excessive grazing pressure can be resolved by 'technological fixes'. The conclusions could be applied in principle to many countries - they are based on the premise that too many resources are used on treating symptoms of land degradation rather than on the underlying causes. In particular, they highlight the need for secure land tenure and the management of forage demand to supply.

The case study on landholders' involvement in management in China (chapter 3) supports the necessity for integrating sound scientific knowledge with effective administration systems. It is critical that all relevant administration systems be involved and work closely together. Furthermore, the scientific approach must be multi-disciplinary. The priority of both involving landholders and building their capacity is critical at all levels of management. The capacity-building may involve changing the mindsets to effect long-term sustainability.

Valuable technology is only useful when it is conducive and supportive of good practice, i.e. contextualising technology into the local production paradigm.

A key point highlights the value of a project which has Integrated Ecosystem Management as an holistic approach to address the linkages between ecosystem functions/services and social, economic and production systems.

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Chapter 4's case study covers beef production under agro-forestry in Spain. It follows the theme of sustainability's importance and acknowledges the complexity of all the factors influencing sustainability. A preliminary step to achieving sustainability was to unify it in the agricultural production context. One of the important points made is the recognition of the positive role of livestock in the grazing ecosystem. The chapter concludes with identifying the necessity of economic, environmental and social responsibilities by all involved in the quest for sustainability.

An Argentinean case study is presented in chapter 5. Moderate disturbance or moderate grazing pressure increased plant diversity and soil carbon. Soil organic carbon was a useful indicator of both soil and land health as it integrates several inherent soil properties.

Chapter 6 addresses treatment of desertification and the consequent conservation benefits in Mongolia. The authors emphasise the necessity of *estimation of carrying capacity (including taking into account the probability of drought) as an ecological core of the national policy for the livestock industry*. The importance of land tenure security is presented as an incentive for the nomads' investments and management practices.

An important point in introducing a community approach is the need for both herders and local government to participate equally in sustainable management. A requirement of this is the development of a new socio-economic policy which facilitates the community approach. In recognition of the need for herders to have a foundational ecological knowledge and up-to-date knowledge, recommendations are made for training and availability of information resources.

There is a need to clarify the roles of multi-ministries/agencies. In the development of the community approach, it is very important to respect existing local traditional rights. At the resource level, it is important to map the rangelands at appropriate scales and to develop new technologies for improving degraded areas. The critical importance of understanding the equilibrium/non-equilibrium concept in rangeland ecology and management is emphasised. A final point in chapter 6 relates to the necessity of understanding man's role in the development of management programmes. In the conclusion, it is clearly recognised that sustainable rangeland management in Mongolia could not be assured under the existing system.

The challenges of rangeland management in Tajikistan are addressed in chapter 7. Much of this country's prosperity is dependent on natural agricultural productivity. The long-term nomadic management had advantages over the modern approach. The immense diversity in climate, pastures, culture and economics across Tajikistan requires variable management which is compatible with national policies as well as the interests of urbanised

populations. Previous national policy changes have often had a negative impact on herders.

Figure 2 illustrates how rangeland management occupies the overlap between the biophysical components and socio-economic systems. The pivotal importance of episodic climatic events is acknowledged. In the section 'Beyond Direct Sustenance Values', it is noted that live weight gain under the nomadic system is twice that under sedentary grazing (highlighting the difference between goals for production per animal and per unit area in Figure 5). Section 4 provides a comprehensive list of the issues that must be addressed to ensure potential benefits from the natural resources are achieved. The conclusion is universally applicable - the importance of integrating human factors with the socio-economic dimensions in any study or development programme in rangelands.

Chapter 8 provides detailed data on the decomposition of feral camel carcasses in Central Australia. The conclusion was that it is important to understand the impact of problem mitigation on the whole ecosystem.

Chapter 9 profiles the impact of climate change and anthropogenic threats on alpine areas in northwest China and their flow-on effect to other countries (particularly to reduced water flow contribution to major river systems in Asia as a result of the glacial decline). There may also be a change in plant species composition in the alpine areas - mainly influenced by increasing temperature. Herders in that region of China consider that the loss of glaciers may increase the land area available for grazing. However, the authors note that if there is a decline in precipitation, overall livestock productivity and biodiversity will decline. Managing for resilience is considered a potentially effective means to address the stresses experienced by the alpine areas. The establishment of a network of Protection Areas is one of the most important aspects for conserving ecosystem responses. The urgent need and important role of data collection for bench-marking changes, as well as on-going monitoring, are strongly promoted. Identification of the needs for sustainable livelihoods of the local people is critical - taking into account the potential conflicts that may arise in achieving both conservation and food/fibre production. The serious problem of on-going encroachment by shrubs into alpine meadows was highlighted. This has implications for biodiversity and livelihood of the local inhabitants.

Chapter 10 provides a global unifying of perspectives. It recognises that rangelands are complex systems used directly and indirectly by a large number of people. Consequently, research and management is difficult. With the wide range of users in the rangelands, a priority of management is understanding how the particular ecosystem functions. The biophysical constraints of the rangelands must be addressed in the framework of the

socio-economic environment, to ensure management achieves an acceptable goal for all stake-holders. Importantly, the decision-making across stake-holders needs to be resolved in terms of the relationship between conservation value and economic viability. The critical point was raised that poverty reduction and conservation goals can be achieved by supporting the poor in using their assets sustainably. Rangeland monitoring can be best achieved by assessing their capacity to provide ecosystem services - which include contributions to the broader well-being and quality of human life, as well as livestock productivity.

The single factor approach should be replaced by a *comprehensive framework which incorporates social, economic and ecological* aspects to facilitate decisions made by local institutions - those involved in service work for the rangelands have the responsibility to ensure that the tools developed support this approach. This book is an important contribution in bringing together production and conservation issues in the rangelands.

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