



Rangelands for better livelihoods

RANGELANDS



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



RESEARCH
PROGRAM ON
Dryland Systems



ICARDA
Science for Better Livelihoods in Dry Areas

Rangelands for better livelihoods

RANGELANDS



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



RESEARCH
PROGRAM ON
Dryland Systems



ICARDA
Science for Better Livelihoods in Dry Areas

Foreword

Rangelands, including grasslands and pastures, represent the main land use type in the drylands. These ecosystems have been long serving many domains related to livestock production, environment equilibrium, and are an indicator of welfare for pastoral and agro-pastoral communities. The contribution of range vegetation to livestock feeding has drastically reduced during the last four decades and their continuous degradation is drawing attention. This has resulted in reduced livestock production and affected the quality of meat and milk.

Rangelands are essentially providing ecosystem goods and services such as forage production, biodiversity conservation, habitat for wildlife, carbon fixation, prevention of erosion and nutrient storage. Despite their ecological, economic and social importance they receive limited scientific and media attention on their conservation merits. This is mainly because they are widely perceived as degraded land suitable only for grazing.

A major shift in rangeland science has to occur, from considering their main function as grazing lands with a specific focus on livestock production to a much broader concept of ecosystem services management. They should be seen as multiple use systems with important consequences for the global environment. Sustainable management should be about striking a balance among environmental conservation, livestock production and socio-economic development.

This publication is intended to add a wider dimension to the understanding most people have about rangelands resources. It is hoped that these key natural resources will receive more attention from all the concerned partners.

Mounir Louhaichi
Rangeland Scientist, ICARDA

Contents

What are Rangelands?.....	1
Where Do They Occur?.....	2
Uses and Values of Rangelands.....	3
A Source of Herbal Medicinal and Aromatic Plants.....	6
Rangeland Management.....	7
Grazing Management.....	8
Rangelands Research.....	9
Monitoring and Evaluation.....	10
Promoting the Full and Effective Participation of Indigenous People.....	11
The Changing Role of Woman Pastoralists.....	12
Herd Mobility.....	13
For More Information.....	14

What are Rangelands?

RANGELANDS are areas with indigenous vegetation that consist predominantly of grasses, grass-like plants, forbs, and shrubs and are managed as a natural ecosystem. Rangelands in dry areas are usually characterized by sharp climatic extremes, limited and poorly distributed precipitation, highly variable soils, frequent soil salinity, diverse topography, and generally sparse vegetation.



Where Do They Occur?



Rangelands are found all over the world, encompassing almost half of the earth's land surface. In Central Asia, West Asia, and North Africa rangelands are the single largest land use type, covering over two-thirds of the total land area. The majority of rangelands are either state or communally-owned.

The significance of ownership is important in the development of policies and programs of rangeland management. Policies and programs must be crafted and implemented to minimize potential human impacts on global climate change. Because rangeland landscapes are diverse and complex, they are called by various names around the world including prairies, plains, swards, steppes, grasslands, scrublands, shrublands, woodlands, wet lands, and meadows.

Uses and Values of Rangelands

Historically, the primary use of rangelands was to provide forage for livestock and wildlife. However, this vision of rangelands as solely grazing lands is narrow. Today, rangelands are recognized for their importance and value in providing much wider variety of services and ecosystem functions.



Rangeland Ecosystem Goods and Services

Not only do rangelands support livestock production, these lands also provide society with valuable products and services. Products and services that support our standard of living and quality of life. These products include, ecosystem services such as mitigating climate change via carbon sequestration, purifying water via bioremediation, and storing genetic diversity within the flora and fauna of these environments.



Uses and Values of Rangelands



Rangelands also provide natural beauty, diversity of wildlife, and recreational opportunities, such as: hunting, hiking, and camping; as well as economic opportunities like ranching and mining. Rangeland watersheds are important for clean and abundant water production. Rangeland soils, vegetation, and water are important for sustaining ecological and economic health of the world. Therefore, rangelands should be managed under the principle of multiple use. This allows for several uses and values of rangelands to be managed simultaneously avoiding overuse or degradation of natural resources (plants, animals, soil, and water). Proper management of rangelands is imperative to the social, economic, and political development of not only pastoral communities but also for society.

Uses and Values of Rangelands

Diversity

An enormous variation exists among and within pastoral production systems. Factors such as precipitation, elevation, steepness, and aspect lead to significant heterogeneity in pastoral products. This effects pastoral people and their cultures that rely on these resources. This high biophysical and sociocultural diversity offers new opportunities for enhancing livelihood diversification.



A Source of Herbal Medicinal and Aromatic Plants



A large amount of aromatic and medicinal plants are sourced from rangelands and medicinal plants play an important role in health interventions for humans and animals, particularly for people with limited medical and veterinary access. The market potential and profit from such plants is high and can result in overharvesting. In many cases the root of the plant holds the medicinal components, causing uprooting, which further threatens the species. Sustainable management and production is needed to assure the viability of many medicinal rangeland species.

Rangeland Management



Rangeland management is a unique discipline that blends science and management for the purpose of protecting and enhancing a sustainable ecosystem. In order to achieve this goal a variety of techniques and tools are available, such as; grazing management, geo-spatial and temporal analysis, restoration techniques, etc. Balancing soil productivity, plant physiology, and climatic conditions are primary functions in management planning. Monitoring and assessment are continual activities in rangeland management.



Grazing Management



Throughout their history rangelands have been used, and in most cases overused, to one degree or another. This historic misuse of resources has created many problems that managers are facing today. Good management and improved information has helped mitigate many of the problems on degraded rangelands. With continuing education and restoration efforts we will see more of our degraded rangelands assuming a stable sustainable state. In many cases grazing can be an effective tool for improving rangelands.

One of the most difficult aspects of grazing management is coming to an agreement on the goals of the community in terms of vegetation and rangeland health. Getting the most benefit out of our rangelands in a sustainable manner is something that is not easily accomplished especially when land tenure is not clear (communal/open access).

Preserving our rangelands for future generations is not only a goal for pastoral and agro-pastoral communities it is also in the interest of society. Rangelands provide food, energy, recreation and countless other benefits. When managed properly our rangelands will be able to keep on working and providing benefits for generations to come.

Rangelands Research

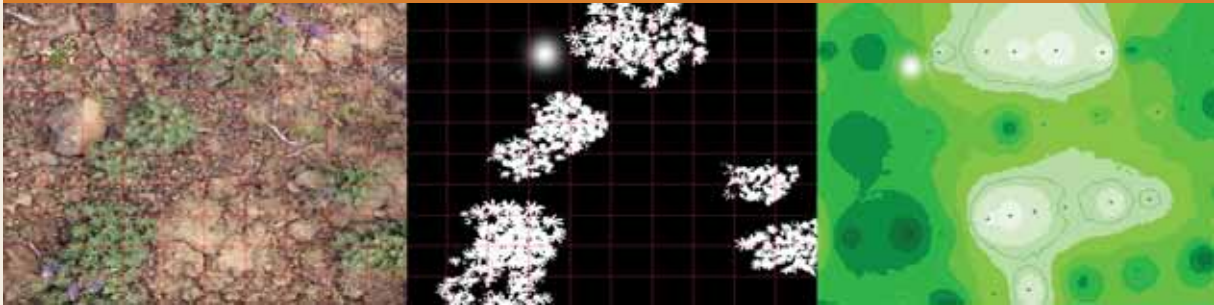
Without understanding how rangeland ecosystem functions, it is difficult to make effective management decisions. This is why rangeland research is so critical in managing these resources. Surveying range landscapes and studying important processes and interactions provides information on the effects of management decisions.

The importance of research in range management has been demonstrated on countless occasions. Research continues to help us understand the complex and dynamic ecosystems that make up our working landscapes. The information that is available to managers today could have prevented many of the failures of the past.

Working with the diverse ecosystems is not something that can be accomplished without valid and up to date information. Since the beginning of the first research institutes there have been drastic changes in use and implementation of information. This has led to vast rangeland improvement.



Monitoring and Evaluation



Appropriate and timely rangeland management strategies require effective monitoring systems that are capable of identifying and quantifying shifting levels of resilience and degradation. Unfortunately, trend assessments tend to be difficult, time-consuming, and expensive. ICARDA's approach to monitoring rangelands prioritizes the use of new technologies – more efficient, cost-effective, and less destructive alternatives.



The use of digital photography speeds-up the collection, processing, and storage of key indicators, and global positioning technologies ensure that recorded measurements are precise. When local measurements are combined with landscape-scale remote sensing such as satellite or high-altitude photography, a complete picture of vegetation dynamics and system changes emerges, thereby informing the development of appropriate mitigation strategies.

Promoting the Full and Effective Participation of Indigenous People



In dryland areas pastoral communities have a close relationship with the natural environment. Often conditions are harsh and natural resources are scarce. Therefore, communities must use the resources carefully and manage them wisely to ensure their continued sustainability. Pastoral communities living within rangelands have adopted a combination of livelihood options to ensure their survival.



Drought in the pastoral areas is not an unexpected event but is instead a common characteristic of these ecosystems. In the past, pastoralists were able to withstand the effects of drought and other environmental stresses by applying coping strategies that have evolved over time. These coping strategies have led to the development of customary early warning systems and resource tracking strategies.



The Changing Role of Woman Pastoralists



Women play an important role in pastoral societies and these roles vary among culture and access to resources. In some cultures women are responsible for making conservation rules and processing livestock products and handicrafts. In other cultures where women have more market access they may be involved in the trading and marketing of animals. As pastoralism is becoming more sedentarized these roles are changing. Pastoralists, and in particular female pastoralists, often face marginalization and low levels of education. It is important that women be given a voice in their community amongst a changing climate and fragmentation of rangelands that leads to sedentarization. These pressures are leading to changing roles that women play. Ensuring their voice and representation in their communities is important so that they can fulfill these changing roles and ensure the betterment of their families.

Herd Mobility



Pastoralists traditionally relied on herd mobility to cope with the unpredictability of climate change and risks in arid and semi-arid lands. Mobility is a key strategy for mitigating the negative impacts of climate change, with increased temperatures and more variable rainfall in response to a changing climate. Seasonal movements are vital for pastoralists to make use of the scattered rangeland resources on a large scale while enabling rangeland auto-regeneration during certain times of the year.



For More Information



References:

Interregional FAO/CIHEAM Research and Development Network on pastures and forage crops website:

http://www.iamz.ciheam.org/en/pages/paginas/pag_investigacion3b.htm

Louhaichi, M. 2011. ICARDA's Research Strategy For Rangeland Ecology and Management in Non-Tropical Dry Areas. *Rangelands* 33(4): 64-70

Louhaichi, M., M. D. Johnson, A. L. Woerz, A. W. Jasra, and D. E. Johnson. 2010. Digital Charting Technique for Monitoring Rangeland Vegetation Cover at Local Scale. *International Journal of Agriculture and Biology* 12: 406-410

The Society for Range Management (SRM) website:

<http://www.rangelands.org/>

Author: Mounir Louhaichi, PhD

Photos: Adnan Termanini, Azaiez Ouled Belgacem, Mounir Louhaichi, Kristina Toderich and Jutta Werner.

Website:

www.icarda.org/rangeland-management/teaser



Saltwater Inland Marsh
Aydar Lake, Uzbekistan



Desert Shrubland
Southern Tunisia



Greater Caucasus
Grasslands, Azerbaijan



Stipa Plant Community
Tunisia



Euro Asia Highland
Pasture, Turkey



Summer Pasture
Tajikistan



Grasslands
Kazakhstan



Haloxylon aphyllum
Sughd, Tajikistan



Prairie
Tajikistan



Saline Flood Plain
Uzbekistan



Rolling Sand Plains
Southern Tunisia



Steppe
Algeria



Alluvial Plains
Shaumari Reserve, Jordan



Salt Affected Scrubland
Tunisia



Steppe (Badia)
Syria



Wetlands
Rajasthan, India



Savannah
Rajasthan, India



Mountainous Rangelands
Southern Morocco



Winter Pasture
Kyrgyzstan



Semi-Arid Mountain
Woodlands Tunisia



RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security



RESEARCH
PROGRAM ON
Dryland Systems



ICARDA
Science for Better Livelihoods in Dry Areas