Rangeland Resources Management

Muhammad Ismail, Rohullah Yaqini, Yan Zhaoli, Andrew Billingsley

Rangelands are areas which, by reason of physical limitations, low and erratic precipitation, rough topography, poor drainage, or extreme temperature, are less suitable for cultivation but are sources of food for free ranging wild and domestic animals, and of water, wood, and mineral products. Rangelands are generally managed as natural ecosystems that make them distinct from pastures for commercial livestock husbandry with irrigation and fertilisation facilities.

Rangeland management is the science and art of optimising returns or benefits from rangelands through the manipulation of rangeland ecosystems. There has been increasing recognition worldwide of rangeland functions and various ecosystem services they provide in recent decades. However, livestock farming is still one of the most important uses of rangelands and will remain so in the foreseeable future.

Rangeland Resources and Use Patterns in Afghanistan

Afghanistan's rangelands are specified as land where the predominant vegetation consists of grasses, herbs, shrubs, and may include areas with low-growing trees such as juniper, pistachio, and oak. The term 'rangeland resources' refers to biological resources within a specific rangeland and associated ecosystems, including vegetation, wildlife, open forests (canopy coverage less than 30%), non-biological products such as soil and minerals. Today, rangelands comprise between 60-75% of Afghanistan's total territory, depending on the source of information. Rangelands are crucial in supplying Afghanistan with livestock products, fuel, building materials, medicinal plants, and providing habitat for wildlife. The water resources captured and regulated in Afghan rangelands are the lifeblood of the country and nourishes nearly 4 million ha of irrigated lands.

Rangelands are important resources for grazing livestock to produce meat, fibre, hide, and manure for fuel and organic fertiliser. The grazing of small ruminants, mainly closely herded flocks of sheep and goat, over the last 5000 years has been an important factor in shaping the development of Afghanistan's plant biodiversity. About half of the nation's GDP is derived from agriculture, and livestock products account for one-quarter of all agricultural sales. Afghan people's livelihoods depend entirely or partially on rangelands, whether they are from nomadic, semi-nomadic, or settled rural communities. Among them, pastoralists and semi-pastoralists are the main rangeland users and managers. More than 85% of the rural Afghan population hold livestock as a key component in their livelihoods. Accordingly, three basic rangeland and livestock management systems coexist in Afghanistan.

Sedentary System

A system practiced by farmers whose main activity is the production of field and fruit crops, and who also raise cattle, sheep, goats, and poultry. Many villages also have access to nearby designated areas for common grazing or rangeland. Large and small ruminants are maintained by a balance between grazing, fodder, and crop residues, and supplemented by little grain.

Transhumance System

A system is practiced by farmers whose primary activity is raising livestock, but who also cultivate grain and fodder crops. Traditionally, these communities move their livestock between different seasonal settlements – winter and summer settlements – together with other communities.

Nomadic Pastoral System

This is a system practiced by mobile pastoralists or Kuchis, whose main livelihood and lifestyle is based on raising livestock for the production of meat, dairy products, and wool, and who live tented lives. They move with their flock and herds as the seasons and grazing dictate, along well-defined lines of migration. Kuchis do not cultivate crops and usually depend on purchased fodder and grain from settled farming communities near which they camp in winter. Cattle, sheep, and goats are the main livestock, while camels, horses, and donkeys are also important. In particular environments, buffaloes and yaks are also raised. An estimated 1.5 to 2 million Kuchis still depend on their nomadic livelihood.

During the drought some farmers sold their oxes and must now make-do with a donkey for plowing the fields in Koohsan district, Herat province.

Conversion of rangeland into other uses: the hill in the foreground is being cultivated

Rangeland livestock are essential to the economy of Afghanistan and the survival of rural people. According to FAO, in 2003, the country produced 107,445 tons of meat, 139,000 tons of milk, 16,000 tons of fibre, and about 3.9 million hides and skins. For households with access to cropland, livestock provides not only the main source of income but also a major source of protein and fibre. The nomadic Kuchi population, of which 1.5 million are estimated to be still active pastoralists, is almost completely dependent on livestock. Livestock population decreased from about 4 million cattle and over 30 million sheep and goats in 1978, to 3.7 million cattle and approximately 15 million sheep and goats as a result of conflict and prolonged drought. The small ruminant sheep and goats are almost totally dependent on natural resources and therefore more susceptible to rangeland and climate conditions, while cattle are often fed with agricultural residues.

Despite the important role rangelands play in sustaining the livelihoods and overall economy of Afghanistan, many problems exist in relation to the use and management of rangeland resources. The problems include rangeland degradation and desertification, shortage of forage resources especially in winter and spring, low public concern for rangeland sustainability, susceptibility to drought and uncertainties, rangelands conversion into rain-fed agricultural lands, uprooting of shrubs for fuel, overall lack of capacity, and conflict over land tenure. The difficulties relate to the broader context of conflict in Afghanistan which, for the past two decades, the country has been saddled with continuously. Nearly 30 years of war has had devastating effects not only on natural resources but also on the Afghan people and the country's infrastructure, institutions, food production systems, and socioeconomic structure. The conflicts and induced poor management system during the last decades have also resulted in inequitable access to and irrational use of rangeland resources.

Key Points for Proper Management of Afghanistan's Rangelands

To tackle the numerous problems facing the management of rangeland resources, long-term dedicated effort involving the local people, especially communities most dependent on and knowledgeable about the rangeland resources they use, should address its proper management. Given the harsh environmental constraints and the current situation in Afghanistan, we propose the following.

Clear rangeland entitlements and responsibilities

In the recent past, legislative and customary use-rights and a few powerful people took over control and use of rangelands without respect for traditional use patterns and access rights. Many local people lost their entitlements as well as their enthusiasm to take up the responsibility for managing the rangelands. The Land Law decree 2003 has given the national government ownership over the country's forests and rangelands. Under this law, the Ministry of Agriculture, Irrigation and Livestock (MAIL) exercises full legal responsibility for managing forests, rangelands, and natural resources. The Ministry's new policies intend to encourage community-based management of natural resources, which acknowledges indigenous knowledge and assets and favours environmental sustainability. For the Ministry to disburse its functions and mandate properly requires technical and material support, as well as the support and active participation of local people, especially herders and farmers.

Wind erosion in Koohsan district blocked the irrigation canal and desertification is going on.

Farmers are cultivating wheat, barley, melon, water melon, and chick pea on rainfed hill land in Herat Province

All people dependent on rangeland, be they nomadic Kuchis, or sedentary communities, or communities somewhere in between, have rights over access to rangeland resources. These rights must be acknowledged and respected. When conflicts arise, a neutral moderator must work to bring the conflicting parties together to negotiate and come to some compromise agreement with all the parties involved.

Promote community participation

Despite the government's ownership of rangelands, local communities in Afghanistan, as in most other places, are the daily users of rangeland resources and should be regarded as its custodians. The new Afghan policy supports a community-based management approach, but ensuring communities' accountability poses a challenge given the disruption of pre-1979 statutory and customary rangeland use agreements, and tensions between nomadic and settled communities.

Improved rangeland management will only happen in a non-threatening environment in which rangeland users, through their representatives, can make their voices heard. It is necessary to establish local decision-making bodies (maybe a committee), and agreements for managing rangelands at the community level. Here, it is essential to recognise that communities are not homogenous groups but made up of different, sometimes conflicting interests. Therefore, in the make-up of these local co-management committees, we must involve representatives from different groups representing different pastoral experiences, ethnicity, gender, age, and well-being.

Encourage adaptive grazing management

Climatic variability in Afghanistan requires an adaptive management mechanism for rangelands. Many people especially decision-makers and researchers in urban lowlands tend to regard mobile livestock grazing – an ancient form of land use, as 'backward' and often propose and impose ways to 'modernise' rangeland use. They fail to recognise that traditional mobile livestock grazing is well adapted to the uncertain environment of rangelands. Rotational grazing – in which flocks move in accordance with the availability of grass and water – is a good practice that is supported by scientific evidence, and well suited to dealing with extremes in weather conditions and unpredictable climate. Mobile livestock grazing systems are therefore biologically-friendly and more resistant and adaptable to ecological and economic changes than sedentary grazing.

A challenge for the government is how to provide these mobile communities with services like education and heath care. An option would be to settle or semi-settle the old and children in villages if they wish. This way, strong herders, both men and women, can move in tents with their livestock while their aging parents and school-age children can settle in a house with better living conditions and where the children can go to school.

Improve rangeland productivity

Afghanistan's rangelands consist of alpine meadows and steppes in the northeast, open woodland and scrub mixtures along the Hindu-Kush range in the centre, and arid deserts in the south, west, and northwest parts. Most of the country's rangelands are believed to be under varying levels of degradation, despite the lack of scientific data to support this.

To enhance rangeland productivity over the short term, we can improve grazing management by a combination of rangeland resting and reseeding periods. For instance, the community may agree where to graze livestock at what times of the year, in such a way that different patches of rangelands can grow and produce mature forage seeds by turns. Farmers and herders can also collect seeds of nutritious and highly productive grass and herbal species from local rangelands and reseed them near scrub roots or other places with relatively good moisture and shade. Perennial forage plants in good vigour can withstand short-term drought, retain soil and moisture, and contribute to good animal health.

Given the shortage of feeds, Afghanistan can also introduce good quality fodder and forage species from Iran, China (Xinjiang, Gansu), Mongolia, Pakistan, India, and other countries with similar ecological conditions. Selection of

Long and severe drought across Central Asia in the years 1997-2004 resulted in a catastrophic loss in livestock and degraded rangeland conditions. In northern and western Afghanistan, from 7-80% of domestic livestock perished and more than half of the pastoralists lost their principal source of livelihood. Planning for droughts and other uncertainties is crucial in rangeland management.

hardy and drought-tolerant local species can be done for the longer term. Introduced and locally selected forage species can be cultivated and harvested to provide winter and spring supplementary feeding, especially to lambing ewes.

Identify alternative energy and livelihood options

More than 80% of Afghanistan's population depend on traditional energy sources such as fuel wood, crop residues, animal waste, and kerosene for their cooking, heating, and lighting needs. Therefore, solar, wind, and other forms of energy should be introduced. The rangeland team of ICIMOD is identifying potentials to fill in the gap between energy supply and demand in the rangeland areas of China, India, Nepal, and Pakistan. The programme may be extended to Afghanistan's rangelands.

Promoting alternative livelihood options for small ruminant livestock keepers offers to reduce the pressure on rangelands and provide the opportunity for risk management. Despite the reduction in livestock population in the last two and half decades until 2004, rangeland productivity did not seem to improve, and most of the rangelands were under varying degrees of degradation. This has been the result of constrained livestock grazing in certain areas, and the effects of prolonged drought. For instance, the nomadic Kuchis have no other options but continue to stay in small areas "to turn the land to dust", if they continue to be denied access to some of their traditional seasonal pastures. Identification of alternative livelihood possibilities, however, will have to be carefully studied, especially in terms of location and link to the broader economic and policy environments. Many non-governmental organisation working in Afghanistan, such as AKF, HELVETAS, and Mercy Corps are endeavouring to develop alternative livelihoods for rural Afghan people.

Education, training and research on rangeland management

Despite the predominance of rangelands, there is no curriculum on rangeland taught in any of the Afghan universities. Therefore, raising public awareness and building the capacity of related departments and stakeholders are needed urgently. Public awareness can be raised through various means such as mass education, training, even recreational events, or through the influence of administrative and religious leaders and community elders, radio and television, brochures, flyers, pamphlets, and other sources of information. The universities also need to develop curriculum on rangelands and their management.

Conducting basic and applied scientific research is equally important to identify rangeland resources, ecosystem status and functions, past and present rangeland use patterns and their effects. So far, there is not much information available about the nature and status of rangelands in Afghanistan. Understanding Afghanistan's rangeland ecosystems in Central Asia, for example, its types of alpine and sub-alpine meadows, semi-arid steppes and arid deserts, will not only help the Afghan people better manage their rangeland resources, it will also provide useful information on environmental change and adaptation strategies for Asian and other global rangelands.

Co-management of Rangelands for Multiple Purposes

Livestock grazing is not the only use of Afghanistan's rangelands. They are also used for many other purposes and services, including mineral products, water regulation, rich biodiversity, clean air, and carbon sequestration. For each of these, there are different users and stakeholders and their interests may be conflicting. This is why rangelands require coordinated management effort. If the parties concerned come together to negotiate among themselves how rangeland resources can be managed, they are managing rangelands in a collaborative way. This is called 'co-management'.

Resource mapping involving various stakeholders

'Co-management'
A situation in which two or more social actors negotiate, define, and guarantee amongst themselves a fair sharing of the management functions, entitlements, and responsibilities for a given territory, area, or set of natural resources.

Research and pilot cases from all over the world have proven co-management to be one of the most promising approaches to the management of rangeland resources and sustained pastoral livelihoods. The essence of co-management is that key government bodies and local communities – including other concerned parties or stakeholders – can negotiate, plan, and carry out strategies to manage rangeland resources through equitable processes and hands-on learning.

In the process of co-management, all the parties, the multiple stakeholders, realise that there is no 'unique and objective' solution for managing natural resources, but that they can tackle emerging problems together through collective wisdom and collaborative actions. Therefore, the co-management approach is in itself a process of 'learning by doing'. The co-management approach can have a different content depending on the place and people concerned. For instance, the parties may focus on various policies and the balance between people benefits and development and conservation at the ministerial, provincial, or national levels. But people will have to negotiate how to use small-scale rangelands, with agreements on where to graze livestock, by whom, for how long, and other issues at the community level. The monitoring and evaluation of co-management of rangeland resources should be participatory and should involve all the major interests and parties concerned. Researchers and non-governmental organisation are often in a good position to play neutral moderators.

The **co-management approach** involves three main steps towards reaching negotiated agreements: **preparation, negotiation,** and **implementation of agreements**. These are depicted in Box 1.

Box 1: **The Co-Management Approach**

Preparing and organising for the partnership

- A neutral moderator (from the government or an outsider) identifies the key issues and concerned parties in an area.
- The moderator goes to one party at a time to get their views on the issues and suggestions for solutions.
- Bring multiple parties together to develop or renew a partnership.

Negotiating co-management plans and agreements

- Encourage the partners to agree on a common goal.
- Create an easy atmosphere for each party to express their opinions and listen to others.
- Let the parties negotiate what should be done to achieve the common goal and the responsibilities and benefits of each .
- Agree on the rules and regulations that all parties should follow including sanctions and punishments for disobedience, and when to review the rules.

Implementing and revising the plans and agreements

'learning-by-doing'

- Each party goes back to fulfill their own responsibility in implementing the collectively agreed plans.
- Meet periodically to review progress and identify new problems and solutions.
- Review the rules and regulations periodically as negotiated, but none should upset previously agreed rules.
- If acute conflicts appear, the parties should go back to the negotiation stage and keep the process going.

For Further Reading

Afghanistan Pastoralists (Kuchi website) www.afghanpastoralists.com/index.htm

Aga Khan Foundation (AKF) www.akdn.org/

Borrini-Feyerabend, G; Farvar, MT; Nguinguiri, JC; Ndangang, VA (2000) *Co-management of natural resources: Organising, negotiating and learning-by doing*. Heidelberg (Germany): Kasparek Verlag GTZ and IUCN

International Centre for Integrated Mountain Development (ICIMOD) www.icimod.org

Ministry of Agriculture Irrigation and Livestock (MAIL), Afghanistan www.agriculture.gov.af/english/English.htm webmaster@agriculture.gov.af

Robinett, D; Miller, D; Bedunah, D (2008) *Central Afghanistan rangelands: A history of tribal rule, grazing, war, and rebuilding rangelands*. 30(4): 2-12

Weijer, FD (2006) *Pastoralists support strategy*. Report to Afghan Ministries and USAID. Available at www.afghanpastoralists.com/Documents/Pastoralist%20Support%20Strategy_final.pdf.

Wily, LA (2004) *Looking for peace on the pastures: Rural land relations in Afghanistan*. Afghanistan Research and Evaluation Unit

Wily, LA (2005) *Strategic issues: getting pastoral rights on the agenda and delivery*. USAID report, available at http://pdf.usaid.gov/pdf_docs/PNADH071.pdf

Yan Zhaoli; Richard, C; Waters-Bayer, A (2008) 'Co-management of rangelands to avoid the tragedy of the commons: Experiences from highland Asia'. In *Multifunctional grasslands in a changing world, Volume II*. Guangzon: Guangdong People's Publishing House

Herders on their way to the alpine summer pastures.