

Sixth In A Series

The Importance Of China's Nomads

The sustainable future development of China's rangelands depends on integrating nomads' indigenous knowledge.

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Editor's Note: *The International Affairs Committee sponsored a symposium entitled "Rangeland Professionals and Society: Future Directions" at the 2001 annual SRM meeting in Kona, Hawaii. From those presentations, a series of articles has been published in Rangelands highlighting perspectives on rangelands from around the world. The following four articles profiling rangelands in China, Africa, Australia and Canada are the last in the series. The editors and authors wish to thank Dow AgroSciences of Indianapolis, Indiana, for a grant made in support of the symposium.*

Rangelands cover 40% (400 million ha) of China's land area making China second only to Australia in the extent of its rangeland resources. About 75% of China's rangelands are found in the semi-arid pastoral areas in the north and west, with the Tibetan pastoral area, comprising 140 million ha, the largest.

China has some 260 pastoral counties, which accommodate about 39 million people, including some of the poorest people in China. Many of them are nomadic pastoralists who are very susceptible to changes in the health and productivity of the rangelands from which they obtain their livelihood.

China's rangelands have been used for livestock grazing for thousands of years. Yaks are believed to have been domesticated on the Tibetan Plateau about 4,500 years ago, and the construction of the Great Wall, which was built to control nomadic societies, was initiated 2,000 years ago. History among nomadic pastoralists in China is the result of multifaceted interactions among cul-

ture, ecology, and personal actions. Over centuries, nomads acquired complex indigenous knowledge of their rangeland environment and the domestic animals they herded.

The future of China's rangelands is of increasing concern. The rangelands of China are the headwaters for many of Asia's major rivers, and what takes place in these grazing lands has implications for millions of people downstream. A number of China's rangeland ecosystems are also recognized as global priority areas for conservation of biodiversity, as they contain highly distinctive species, ecological processes, and evolutionary phenomena. Despite their extent and importance, China's rangelands are degrading seriously, and the country's range managers face many challenges.

As a first step, the sustainable future development of China's rangelands must recognize the significance of nomads' indigenous knowledge of the environment and management of rangeland resources.

Indigenous knowledge is the unique, traditional, local knowledge that people have of a particular geographic area. The development of indigenous knowledge systems (which covers many aspects of life, including rangeland management and animal husbandry) has been a matter of survival for nomadic pastoralists throughout China, including those on the Tibetan Plateau.

Indigenous knowledge systems of nomads are cumulative, representing generations of experience herding livestock, careful observations, and trial-and-error experiments. This knowledge enabled nomads on the Tibetan Plateau, for example, to develop sophisticated range-

livestock management practices in an environment that posed considerable risks. Indigenous knowledge systems are also dynamic as new information is constantly being added.

Nomads Are Skilled Range Managers

Nomads raise native livestock that are adapted to local environmental and production constraints. For example, Tibetan nomads raise the yak, which is superbly adapted to the high altitude and the cold environment of the Tibetan Plateau. Native Tibetan sheep and cashmere-producing goats are also important species of livestock.

Tibetan nomads usually raise a mix of livestock species each of which has its own specific characteristics and adaptations to the environment. The multi-species grazing system combines yaks, sheep, goats and horses together and



*Tibetan nomads selling yak milk.
Photo by Daniel J. Miller*



Yak caravan at 4,800m, Tibet, China. Photo by Daniel J. Miller

maximizes the use of rangeland vegetation. Different animals also have varied uses and provide diversified products for home consumption or sale. Large numbers of male yaks are often kept as pack animals, and male yaks and sheep/goats are used to provide animals for sale and for nomads own consumption.

Livestock mobility and flexible use of rangeland were strategic elements of traditional Tibetan pastoralism and the keys to survival. Rangelands are parceled into seasonal pastures and used according to diverse managerial and production objectives. The traditional nomadic pastoral systems that evolved used extensive grazing management strategies adapted to local environmental conditions. Tibetan nomads, like nomads elsewhere in China, did not move randomly across the rangeland; rather their movements were often well prescribed by complex social organizations and were highly regulated.

Environmental risks on the rangelands were mitigated through livestock and grazing management strategies. Livestock mobility, flexible use of rangelands, and diverse herds were key elements of traditional pastoral production systems and contributed to the high ecological stability of the pastoral systems. Nomads maintained a diverse mix of goals for livestock production and survival; they kept a diverse mix of livestock in terms of species and class; and they used a diverse mosaic of rangeland sites, exploiting seasonal and annual variability in rangeland resources.

The flexibility of traditional Tibetan

nomadic pastoralism (which emphasized multi-species herds, complex herd structures, regular movement of livestock, and linkages with agricultural communities) developed as a rational response to the unpredictability of the ecosystem. The survival of numerous prosperous groups of Tibetan nomads bears witness to their extraordinary indigenous knowledge, resourcefulness, and animal husbandry skills.

Tibetan nomadic pastoralism evolved through long-term adaptation and persistence in a harsh environment and the grazing and livestock management systems that developed were intelligent, aggregate behavioral responses by Tibetan nomads to the resources and risks of one of the most inhospitable rangeland environments on earth. Because they are skilled, experienced, proficient, expert, able, adept, and masterful, Tibetan no-

mads, like nomads throughout China, are "professional" range managers, despite being illiterate.

China's Rangelands Are Being Cropped

Traditional livestock production and grazing management strategies throughout much of the pastoral areas of China have been greatly altered in the recent decades as the nomadic pastoral way of life has been transformed to one more oriented toward a market economy.

The goal of livestock production in most pastoral areas is now to increase livestock off-take, which has been promoted through privatization of herds and rangeland, less migration by the nomads, intensive grazing management strategies, and introduction of rain-fed farming techniques for growing forage and fodder. Large areas of rangeland have also been converted to cropland, which is one of the primary causes of rangeland degradation.

Many of these interventions have been responses to political or economic objectives but, in many instances, they have conflicted with the goal of maintaining rangeland ecosystem health and stability. The promotion of improved and scientific animal husbandry systems has also jeopardized many worthy aspects of traditional nomadic pastoral systems. Both the rangeland environment and the indigenous nomadic pastoral cultures are under threat in areas where the culture of mobile pastoralism has been eliminated or substantially reduced.



Tibetan pastoral woman at Sichuan Prov., China. Photo by Daniel J. Miller



Tibetan nomad women, Tibet, China 5,000 m. Photo by Daniel J. Miller

Large tracts of China's rangelands are now degraded. It's estimated that about 34% of all rangelands in China are moderately to severely degraded and about 90% are degraded to some degree. Inner Mongolia, Xinjiang and Gansu are experiencing degradation levels well above the national average.

Current livestock production systems in many of the pastoral areas of China now appear to be unsustainable and the development of intensive livestock production systems as a means to increase production of livestock products and alleviate poverty in pastoral areas will place additional pressure on rangeland ecosystems.

In China, many attitudes towards rangeland ecosystems appear to be influenced by the notion that sedentary

agriculture, particularly crop-based agriculture, is the superior development option. Rangelands are viewed as systems to be controlled and modified, much like cropland, rather than to be managed as natural ecosystems. This view is reflected in many of the terms like grassland construction and grassland ecological-engineering that are used in discussion of pastoral development. Development is focused on agronomic and production aspects instead of ecological sustainability. There appears to be little acceptance of the fact that most of the rangelands in China are of low productivity or that this situation is unalterable, either for ecological, technical and/or economic reasons.

New Thinking And Research Needed

There is a similarly narrow-minded view of the validity of traditional nomadic pastoral production practices. The purposeful movement of nomads' herds is often viewed as wandering and an unsound type of use of the rangeland, instead of an efficient utilization of forage. Nomads themselves are often perceived as backward and ignorant.

These views are not supported by research findings which suggest that nomads possess considerable indigenous knowledge and that many of the traditional nomadic pastoral strategies and practices are rational and ecologically and economically sound, given the environmental and socio-economic constraints under which nomads operate. These findings suggest that fresh, objective assessments of nomads and no-

madic pastoral systems in China need to be made before completely discarding them.

The issue is compounded by the limited approach taken to rangeland ecosystem research in China. Researchers have generally neglected such topics as the effects of traditional pastoral systems on rangeland ecology, the dynamics of herd growth and traditional risk management strategies among nomads, and the impact of large numbers of farmers into pastoral areas to convert rangeland to cropland.

Other problems include a general lack of applied, interdisciplinary ecosystem-level research, which would provide a better basis for developing more integrated and sustainable rangeland and pastoral development programs. A disproportionate amount of rangeland research is directed towards livestock production rather than understanding how livestock fit into the wider ecological system and how to optimize production in an environmentally and socially sustainable way.

Nomads have played an important role in the rangelands of China for thousands of years. As such, the social dimension of rangeland ecosystems should be an important aspect of research and development in the pastoral areas but, unfortunately, it is not. Thus, little information is available about nomadic pastoralism and misconceptions abound with regards to nomads and their way of life. In China, both organizational divisions between academic disciplines and the intellectual assumption that views human beings as separate from their natural environment have impeded the integration of social and natural scientific research in rangeland environments.

The rationality of nomadic practices needs to be better acknowledged and nomads' indigenous knowledge has to be incorporated into research and development programs. Paying attention to nomads' indigenous knowledge can create more respect for traditional pastoral systems and foster partnerships for resolving issues. Better acknowledgement of nomads' knowledge systems can help build a more sustainable future for the rangelands of China.



Tibetan nomad family. Photo by Daniel J. Miller