

High Elevation Grasslands of Nepal

Daniel J. Miller

It was sunrise in the Himalaya and it was a sight I would never forget. I was standing at 16,000 feet surrounded by 23,000 foot snow peaks glowing with the rays of the morning sun. Stretched out in front of me was a lush green carpet of alpine grasslands dotted with colorful wildflowers. In the distance herds of yaks grazed peacefully and the stillness was broken by the shouts of herders and the cracks of their yak hair sling shots as they moved their animals across some of the highest rangelands in the world.

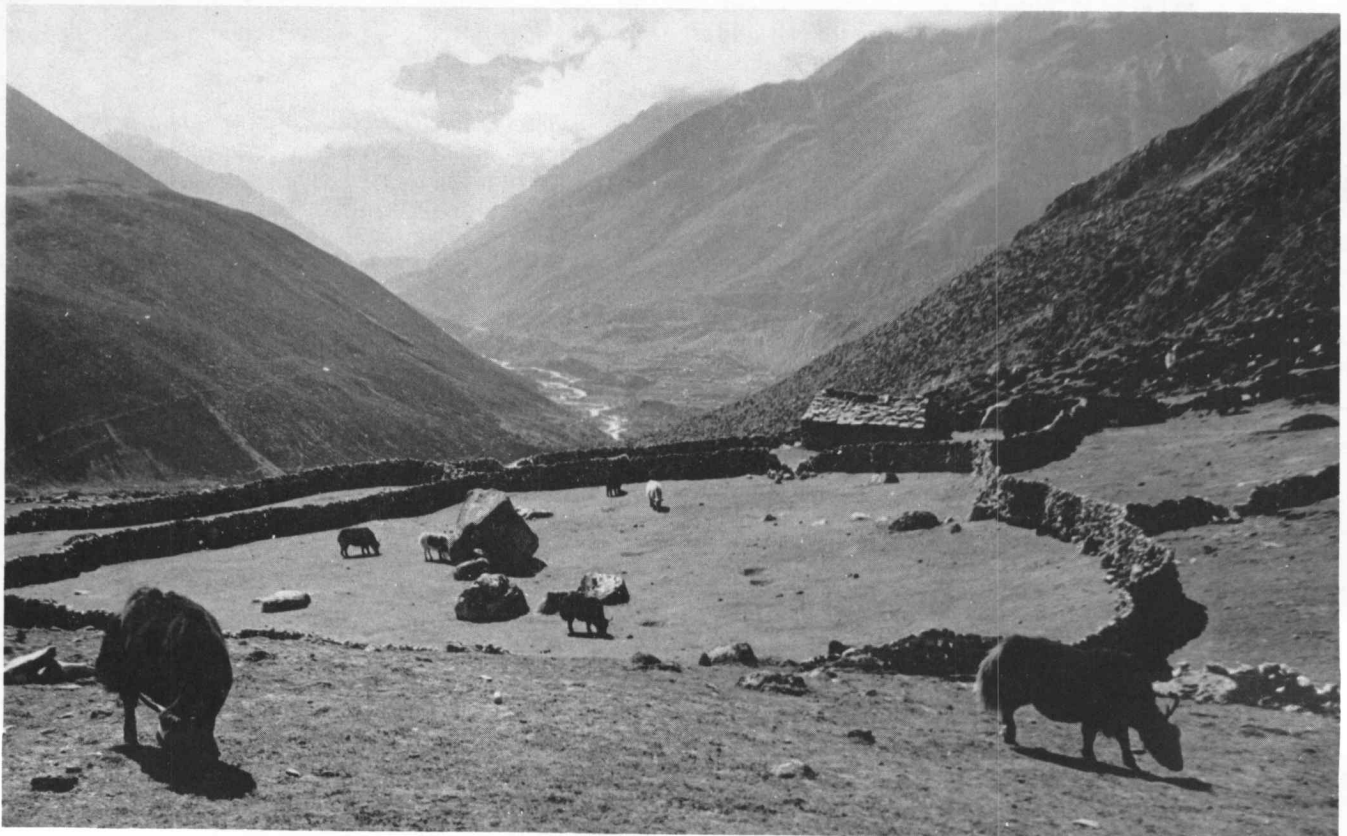
As a Peace Corps Volunteer in Nepal in the mid 1970's I worked with a Government of Nepal pasture development project and in early 1984 went back to Nepal to conduct range inventories for a US-Agency International Development project involved with resource conservation. The objective of this paper is to acquaint readers with some of the rangelands found in Nepal.

Nepal is a small Asian country running northwest to southeast between latitude 26 and 30° N. Sandwiched in between India to the south and Tibet to the north Nepal is about 500 miles long and 90 to 110 miles wide. The Himalaya mountain range extends all across northern Nepal. Nepal is a land of incredible contrast. In the south, along the Indian border, there are subtropical forests and savannah grasslands where rhinoceros and tigers are found. Only 90 miles away from

these steaming jungles are located the highest mountains in the world.

Climatic conditions in Nepal are varied depending on altitude. Most of the precipitation is concentrated during the monsoon season, lasting from June to September. Generally, the rains are greater in July and August. Some subtropical valleys on the southern slopes of the Himalaya receive up to 200 inches of precipitation while in the rain shadow on the north side of the Himalaya it is very arid with less than 15 inches of rainfall. Snowfall makes up a small percentage of the total precipitation.

Grasslands vary from subtropical to alpine and cold-dry steppe and cover about 4.2 million acres of land or about 12% of the total land area of Nepal. Grasslands dominated by subtropical grass species are found up to about 6,000 feet. Common genera were *Chrysopogon*, *Cymbopogon*, *Themeda*, *Eragrostis*, *Apluda*, *Cynodon*, *Bothriocola*, *Saccharum*, *Heteropogon*, and *Arundinella*. Most of the existing subtropical grasslands are found only on land too marginal for crops and have been severely overgrazed. The rapidly growing human and animal populations in the mid hills of Nepal are having a profound deteriorating effect on the existing grasslands and forests.



Hay meadows at 15,500 ft in the Mt. Everest area. The primary grass in these meadows is wild ryegrass (*Elymus nutans*).



Herdsman and horses in Dolpo. *Caragana* bushes in foreground.

The Langtang Valley of north central Nepal is a higher inner valley located at an elevation of 11–13,000 feet. H.W. Tilman, the first Westerner to visit the area in 1949, termed the valley "a grazer's paradise." The broad valley and mountain slopes provide grazing for large herds of domestic yaks and sheep in addition to wildlife like Himalayan tahr and musk deer. Southern exposure slopes at 10–11,000 feet are dominated by *Andropogon tristis* and *Arundinella hookerii*. In grasslands at higher elevations up to 15,000 feet the dominant genera were *Danthonia*, *Festuca*, *Elymus*, and *Stipa*. Other commonly encountered genera were *Agrostis*, *Deyeuxia*, *Poa*, *Helictotrichon*, *Bromus*, and *Tristeum*. Shrubs such as *Juniperus*, *Rhododendron*, *Berberis*, *Lonicera* and *Caragana* are also frequently found. Above 15,000 feet rangelands were dominated by *Festuca ovina* and genera *Carex* and *Kobresia*. Forbs are also very important members of the alpine plant community.



Yak herders' hut in the Langtang Valley.



A herder's hut of canvas at over 14,000 ft.

The subalpine and alpine rangelands in the Langtang Valley are grazed in the summer by large herds of yaks, yak hybrids, and sheep. These animals are taken to these high elevation grasslands in June, where they stay until October when they are taken to lower elevations. While in the high pastures herders live in permanent stone walled structures. Female yaks and yak hybrids are milked and milk is made into butter and cheese. In the winter animals are either kept around the villages or taken to the grazing lands at even lower elevations.

In Langtang, as in other parts of Nepal, hay making is practiced. Native grass is cut in September when the monsoon ends and hay is fed to livestock during the winter. In the Khumbu region near Mount Everest, Sherpas, who are famous for their exploits on climbing expeditions, also have large herds of yaks that graze alpine rangelands. Sherpa herdsman maintain extensive hay meadows at 14–15,000 feet where the dominant native grass used for hay is a wild ryegrass, *Elymus nutans*. In the Kali Gandaki Valley at eleva-



Tibetan goats being milked in Dolpo, 15,000 ft.

tions of 8,500 feet native grass is also cut for hay by the villagers. In this region the most common native grass species used for hay is *Pennisetum flaccidum*. A native alfalfa is also widely grown for hay making in the arid environment of the Kali Gandaki.



Yearling yaks.

and Mustang to the north of the main Himalayan range overgrazed rangelands are a serious problem. In these regions herders, although not actually nomads because they have homes and fields, live much like Tibetan nomads in yak hair tents the year round as they take care of their sheep, goats, and yaks. Nomads in Tibet were called drokpas, which means "people of the high pastures." These nomadic-like herders living near the Tibetan border in Nepal have traditionally had access to grazing lands in Tibet where they took their herds during the winter to graze. These grasslands in Tibet that have been used for centuries by Nepalese pastoralists are now being closed to them by Chinese authorities.

These restrictions may have serious effects on the rangelands and pastoral economy of northern Nepal. Many of these border areas in Nepal received extremely heavy grazing pressure in the early 1960's when Tibetan refugees fleeing from the Chinese brought large herds of yaks and sheep into northern Nepal. Thousands of animals died because of a lack of forage. The closing of the Tibetan border to livestock from Nepal now may cause even further deterioration in the condition of the high altitude rangelands in northern Nepal unless urgent steps are taken to initiate rangeland rehabilitation programs and provide adequate winter feed supplies●



Mature yak.

Many of the high elevation grasslands in Nepal are heavily overgrazed. In the drier Tibetan-like steppe areas of Dolpo



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