RESTOCKING AND PASTORAL DEVELOPMENT AMONG TIBETAN NOMADS AFTER A SEVERE WINTER ON THE TIBETAN PLATEAU IN WESTERN CHINA

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The winter of 1997-1998 was one of the worst winters in recent history across much of the Tibetan nomadic pastoral area in Western China. Unusually heavy snowfall occurred in late September and was followed by severe cold weather which prevented the snow from melting. Additional snowstorms deposited more snow and by late October grass on the rangeland that had been reserved for winter livestock grazing was buried under a meter of snow. Nomads' livestock, that includes yaks, sheep, goats, and horses, were unable to reach any forage and started to die in large numbers.

By early April 1998, it was estimated that the Tibetan Autonomous Region had lost over 3 million head of livestock. In the Tibetan Autonomous Region (TAR), Naqu Prefecture in the north and Ali Prefecture in the west were especially hard hit and parts of Shigatse, Shannan, and Chamdo Prefectures and Lhasa Municipality were also affected by the heavy snow storms. Parts of southwestern Qinghai Province were also hit hard. Losses in Naqu Prefecture in the TAR alone were estimated at 1.03 million animals or about 15 percent of the Prefecture's total livestock population. In Naqu Prefecture, almost all areas were affected by the severe snowstorms but the counties of Amdo, Nyerong, Jiali, Sokshan, and Naqu were the most seriously affected. In Nyerong County, one of the areas hardest hit, 30 percent of the livestock died, but some townships in the county lost 70 percent of their livestock. In Naqu County, a number of townships lost 50 percent of their livestock. In Jiali County, the three townships hardest hit by the snowstorms lost 40 percent of their domestic animals. It is estimated that economic losses just from livestock deaths alone may reach RMB 1 billion (US$ 125 million) in the Tibetan Autonomous Region.

Tibetan nomads, dependent almost solely on livestock for a livelihood, suffered greatly as a result of the heavy snowfalls. Since the snow came so unusually early, many nomads were unable to even sell animals they had planned to market in the fall of 1997, or to even barter livestock for barley grain they require. Many nomad families even fed whatever grain they had for themselves to their livestock to try to save the animals from dying. Thousands of nomad families, who lost most of their animals, are now confronting a situation of dire poverty. Last year, before the snowstorms began, it was estimated that 20 percent of Naqu Prefecture's 340,000 nomadic population (about 50,000 households) were considered to be living in poverty. Now, as a result of the

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1 Nomads are considered to be in poverty when the per capita income is less than about RMB 700. With respect to the number of animals in relation to poverty, it was reported that 25 Sheep Equivalent Units (SEUs) per person was the break-off point for poverty. Families with less than 25 SEUS per person would
livestock losses experienced over the winter, it is estimated that about 40 percent of the nomad population in Naqu Prefecture will be facing poverty situations. Many other nomad families will have their livelihoods reduced as a result of livestock losses, although they will still technically be above the poverty line.

Although the winter is now over and grass is growing again (in many places much better than normal because of the increased meltwater from the winter's heavy snow), the effect of last winter's livestock losses will reverberate among many Tibetan nomads for years to come. The government has initiated livestock restocking programs to assist nomads that lost animals, but resources are insufficient to replace all the livestock lost. Even with restocking, it will take considerable time for nomads to build their herds up again to levels they were at in 1997 before the heavy snow storms started. Thousands of nomad families with fewer animals now will be facing great difficulties in meeting their basic needs for subsistence for some years to come.

Many government agencies and various NGOs provided emergency relief assistance to nomads affected by the snowstorms and now there is greatly increased interest by the government, NGOs, and donors to assist Tibetan nomads with restocking and pastoral development. This briefing note has been prepared to provide readers with more information about Tibetan nomadic pastoral production, and to briefly outline some of the issues and challenges that exist regarding livestock restocking and pastoral development on the Tibetan Plateau in Western China.

Tibetan nomadic pastoral production systems vary widely across the Tibetan Plateau. Nomads usually raise a mix of different animal species. Each species has its own specific characteristics and adaptations to the environment. The multi-species grazing system – the raising of yaks, sheep, goats, and horses together – maximizes the use of rangeland vegetation. Different species graze on different plants and, when herded together on the same range, make more efficient use of rangeland vegetation than a single species. Different animals also have varied uses and provide diversified products for home consumption or sale. Maintaining diverse herd compositions is also a strategy employed by nomads to minimize the risk of losses from disease or harsh winters. A mix of different species provides some insurance that not all animals will be lost and herds can be rebuilt again. The refinement that nomads attained in devising herd compositions is illustrated by one nomad area in northwest Ngamring County of Shigatse Prefecture. There, sheep comprised 45% of all livestock numbers, goats made up 40%, yaks made up 14%, and horses were 1%. Such herd composition also requires complex strategies for managing livestock, as each species has its own specific grazing and production-related characteristics.

In terms of livestock species mix, the herd design of Tibetan pastoral system is not haphazard or irrational, but, instead, demonstrates sophisticated adaptive responses by

not be able to meet their basic needs and would be in poverty. One adult sheep is 1 SEU; 1 yak equals 5 SEUs. In other words, a person would need at least 25 adult sheep or 5 adult yak to meet their basic needs.
nomads to the environment in which they live and the resources available to them. The proportion of different livestock species raised varies regionally across the Tibetan Plateau, generally according to rangeland factors and the suitability of the landscape for different animals. Herd compositions within a geographic area can also vary with the skills, preferences and availability of labor of the nomads. For example, in Shuanghu County of Naqu Prefecture in the Tibetan Autonomous Region, yaks only make up 4 percent of total livestock numbers while in Jiali County, about 400 km to the east in Naqu Prefecture, yaks comprise 53 percent of all livestock. These differences can largely be explained by differences in vegetation between the two areas. In Shuanghu, it is drier and the dominant alpine steppe vegetation is more suited to sheep and goats, but in Jiali there is more annual precipitation and vegetation is dominated by alpine meadow which is more conducive to raising yaks. In the very northeastern part of the Tibetan Plateau, in Hongyuan County of Sichuan Province, yaks are even more important in the pastoral economy. In Hongyuan, yaks comprise over 85 percent of all livestock numbers.

Yaks are one of the most important domestic animals found in most of the pastoral area on the Tibetan Plateau. Although Tibetan nomads also raise other animals, they place so much value on the yak that the Tibetan term for yaks, nor, is also translated as “wealth”. The yak, in many ways, defines nomadic pastoralism across most of the Tibetan Plateau. Yaks provide milk and milk products, meat, hair, wool, and hides. Yaks are also used as draught animals and for riding. Yak dung is an important source of fuel in an area where firewood is not available. The yak makes life possible for man in one of the world’s harshest environments. There is little doubt that the presence of wild yaks, and their later domestication, was the single most important factor in the adaptation of civilization on the Tibetan Plateau. China has a yak population of about 13 million, which is about 90 percent of all the yaks in the world. There are about 4.7 million yaks in Qinghai Province, 4 million in Tibet, 3.4 million in Sichuan, 900 thousand in Gansu, 230 thousand in Xinjiang, and 50 thousand in Yunnan Province.

In terms of numbers of animals that nomads raise, it varies considerably across the Tibetan Plateau depending on herd composition, however, the following data provides some insight on numbers of livestock nomads maintain. In Shuanghu and Nyima counties in Naqu Prefecture in the TAR, an average income nomad family keeps about 250 sheep, 100 goats, 15 yaks and 2 horses. In Naqu County in the TAR, a typical nomad family of 5-6 persons would have 60-80 sheep and goats, 30-35 yaks and 2 horses. A rich family in Naqu may have perhaps 200-300 sheep and goats and 100 yaks. In Hongyuan County of northwest Sichuan Province, a typical nomad family would have 100 yaks, 5 horses and only a few, or no, sheep. Of the 100 yaks that the nomad household in Hongyuan has, only 30-40 of them would be adult, milking female yaks. In the nomad region of Phala, Ngamring County, Shigatse Prefecture of the TAR, the richest nomad family had 286 sheep, 250 goats, 77 yaks and 8 horses.

Almost all animals are owned by individual nomad families, which has been the case since the Household Responsibility System was implemented in the early 1980s. Each family is responsible for its own livestock production and the marketing of livestock
products. Rangeland, until just recently (see more on this below), has remained the
property of the state and nomads generally use the rangelands communally, often in
groups that reflect the previous communal structure, and in some cases, livestock grazing
by the nomads now mirrors the traditional management structure that existed prior to
collectivization. Livestock subsists almost entirely on grazing on the rangelands year
round. Some hay is made to feed weak animals and horses in the winter and spring, but
for the most part, animals acquire all their forage requirements from grazing.
Increasingly, nomads are fencing rangeland to reserve pastures for winter and spring
grazing and planting artificial pasture for either winter-spring grazing or for hay making.

Regarding livestock production, nomads maintain milking and non-milking herds of
yaks, sheep, and goats. Across most of the western Tibetan Autonomous Region, sheep
and goats are more common than yaks and both sheep and goats are milked in the
summer. When sheep are found in the eastern TAR, and in the Tibetan nomad areas of
Qinghai, Sichuan, and Gansu they are usually not milked. Female yaks usually have their
first calf when they are four years old and usually only have one calf every other year,
although the yak cow is still milked in the second summer. Where forage conditions are
better, yaks will have a calf every year. Male yaks are usually slaughtered for meat at
four years of age.

Yaks are generally thought to characterize Tibetan nomadic production, however, in
much of the western Tibetan Autonomous Region sheep and goats are more important
economically. For example, in the Phala nomad area of northwestern Ngamring County,
Shigatse Prefecture, in a large nomad family where sheep made up only 28 percent of
livestock biomass, or Sheep Equivalent Units, they contributed about 60 percent of total
income derived from livestock. Goats, which made up about 21 percent of livestock
biomass, contributed about 35 percent of total livestock income. Yaks only accounted for
about 5 percent of total livestock income, yet they comprised about 46 percent of total
livestock biomass in the nomad’s herd. Sheep and goats, although they require more
care and attention than yaks, can deliver handsome economic returns to nomads where it
is practical to raise them. Since they generally give birth every year, unlike yaks which
usually calve every other year, sheep and goats can proliferate quickly, an important point
to remember when restocking is being considered for nomads that lost animals as a result
of severe winters.

Regarding the large livestock losses that occurred last winter, it is important to keep in
mind that nomads have been herding livestock on the Tibetan Plateau for thousands of
years. For millennia, Tibetan nomads and their livestock have dealt with snowstorms and
severe winters in the highly dynamic ecosystem that exists on the Tibetan Plateau.
Tibetan pastoralism has always been a high risk enterprise. Nomads learned to cope with
the uncertainties of the environment by adopting a number of flexible production
strategies that minimized risk and made optimal use of the resources available to them.

Heavy snowfall, such as the one that took place this last winter in Tibet, should be
viewed as natural events of the Tibetan Plateau environment, not as disasters. In fact,
snowstorms probably serve a very important natural regulatory mechanism in the grazing land ecosystem. Periodic heavy snowfalls reduce the number of livestock and wild ungulates grazing on the rangelands, thereby enabling the grasses to recover from grazing. Unlike severe droughts in semi-arid pastoral areas which can also greatly reduce livestock numbers, heavy snowfalls do not negatively affect the vegetation as droughts do. In fact, heavy snowfalls can actually lead to improved grass growth the following spring due to increased water infiltration into the soil. So, rather than a disaster, heavy snowfalls should be seen as a part of the ecology of the Tibetan landscape. Nomads survived severe snowstorms in the past, when there were no PLA trucks to transport NGO-supplied relief supplies, and they will survive winters in the future when there is heavy snowfalls as well.

It is widely believed by many government officials that the large livestock losses experienced in the severe winters in recent years are because nomads are backward and do not practice modern, scientific animal husbandry methods. The structure of nomads’ herds is often thought to be irrational and uneconomic with too few breeding females and too many unproductive animals. Many officials also believe that the traditional nomadic, or migratory, grazing practiced by Tibetan nomads is an improper use of the grassland and, since grazing is usually communal, officials often believe there is no incentive for individual nomads to manage the grasslands or to invest in improving the grasslands.

As a result, say many officials, the nomads keep too many unproductive animals just as a status symbol, traditional nomadic grazing systems do not allow for management of the grasslands, and the grasslands are overgrazed and degrading. In addition, since the nomads are not settled, officials often mention that it is difficult to provide social services such as education and health services to nomads. Many officials insist that for development to be achieved in Tibetan pastoral areas the following activities need to be undertaken: the nomads have to be settled and they need to construct houses and barns; rangeland has to be divided into individual parcels and given to nomads on a long-term contract and fenced; livestock numbers need to be limited to the carrying capacity of the grassland; artificial pasture needs to be grown; and herds need to be restructured. It is widely believed that such improvements would help prevent large livestock losses during snow disasters, improve the management of the rangelands, increase livestock productivity, and raise nomads’ overall livelihood.

About ten years ago, in Tibetan nomad areas near Qinghai Lake, in Qinghai Province, pastoral development programs were initiated by the government that promoted the settling down of nomads and the division and allocation of rangeland to individual nomad households. Starting first in the traditional winter grazing lands, each nomad family was allocated a specific amount of rangeland on a long-term contract in what was essentially a privatization of the previously communal managed grassland. Pastures were also fenced to demarcate boundaries between pastures belonging to different nomads. The amount of land each nomad household was allocated was based on the supposed carrying capacity of the rangeland and the number of livestock the family had. The construction of houses for nomads, sheds for livestock, fencing, and development of artificial pasture was also
encouraged and, in fact, heavily subsidized. This program, deemed a success by officials, was later expanded to privatize all the grazing lands used throughout the year, not just the winter pastures. This same pastoral development program is now being rapidly extended throughout Qinghai Province and into the Tibetan nomadic areas of Gansu and Sichuan Provinces. Due to the high cost involved in fencing, the TAR is not yet allocating grazing land to individual nomad households, rather they are allocating the grazing land to nomad groups. But, even in the TAR, official policies promote the settling down of the nomads, construction of houses and barns, fencing of pastures and the growing of artificial pasture.

Many misconceptions abound regarding nomads, nomadic pastoralism, and pastoral development on the Tibetan Plateau. Sifting fallacies from facts is often confounded by the lack of good data on nomadic pastoral production systems and the often political and donor driven push to alleviate poverty among poor nomads and to develop the hinterlands of China. In addition, there is also now increasing clamor to assist with disaster prevention in nomad areas that experienced large livestock losses last year, as if it is already ordained that snow disasters will strike again in the same areas. Given the generally poor regard that livestock development now has throughout much of the developing world, perhaps it is easier for NGOs to obtain funding for support to Tibetan nomads and pastoral development in Tibet if it is presented as disaster prevention. As a range and livestock specialist, however, I have trouble with calling what needs to be done to assist nomads as disaster prevention. Nevertheless, it is still possible to separate out some of the realities and myths regarding nomadic pastoral production on the Tibetan Plateau.

Nomadic existence on the Tibetan Plateau – undoubtedly the world’s harshest pastoral area – yet today is proof of the rationality for and efficacy of many aspects of traditional Tibetan nomadic pastoral production practices. Over centuries, Tibetan nomads acquired complex knowledge and understanding of the environment in which they lived and upon which their lives depended. The fact that numerous, prosperous pastoral groups remain to this day bears witness to the extraordinary knowledge and animal husbandry skills of the nomads. Unfortunately, pastoral development policies on the Tibetan Plateau, as elsewhere in much of the pastoral world, often maintain that nomads are ‘backward’ and that their traditional nomadic practices need to be ‘improved’. Nomads, however, should be considered as ‘experts’ even though they may be illiterate. Many old Tibetan nomads have probably already forgotten more details about rangelands and yaks than many young range ecologists and animal nutritionists will ever learn in college.

In terms of herd structure, or the proportion of different sex and age classes of livestock, the traditional structure of nomads’ herds also illustrate nomads’ expertise in animal husbandry and in managing grazing land and animal resources available to them. In a nomad area in northwest Shigatse Prefecture, almost 60 percent of the adult sheep and goats are females. Although adult male sheep and goats make up about 30% of the flock, which, at first, may seem like a high percentage, it needs to be pointed out that a significant portion of the nomads’ income is derived from sheep wool and goat cashmere.
harvested from adult males and from the sale of adult male animals for meat. The traditional nomadic pastoral system also required pack yaks to move nomads’ supplies between different pastures. A nomad family, therefore, had to have a number of pack yaks in its herd in order to survive. Unfortunately, the utility and economic viability of nomads’ existing herd structures are still very much unappreciated and pastoral policies for restructuring nomads’ herds to contain a higher percentage of breeding females usually do not acknowledge the reasons behind the existing herd structure in the first place. Too often, policies for Tibetan nomadic areas are made by officials who do not know which end of a yak gets up first.

Mobility is an important feature of nomadic pastoralism on the Tibetan Plateau. The pastoral system was designed around the movement of livestock to different pastures at different seasons of the year and the tracking of favorable forage conditions. Decisions on herd movement also took into consideration factors such as past use, snowfall and rainfall, growth stage of the grass, and the condition of animals. Contrary to widespread views by many people that nomads just wandered freely and there was no management of the grassland, the fact of the matter is that Tibetan nomads do not move randomly across the landscape. Rather, their movements are often well prescribed by complex social organizations and are highly regulated and, always have been.

While much of the rangeland in the agricultural valleys of Central Tibet are heavily overgrazed and in a badly deteriorated condition, the situation in many of the nomadic pastoral areas is not as bad. Many rangeland areas in Tibet are, in fact, in good condition, despite centuries of livestock grazing. There is increasing concern with rangeland degradation in pastoral areas, especially in parts of Amdo County in the TAR and in Dari and Magen counties in Qinghai Province where ‘black beach’, or badly degraded rangeland with soil exposed, is common. However, the dynamics of the degradation process in these ‘black beach’ areas is still not well understood and the jury is still out on whether or not heavy livestock grazing is the real cause of the problem or if other factors, such as climate change, are also involved. Despite their extent and importance, rangeland ecosystem dynamics on the Tibetan Plateau are still poorly understood and good, scientific data on ecological processes taking place throughout the different rangeland types are limited. Many questions concerning how rangeland vegetation functions and the effect of grazing animals on the pastoral system remain unanswered for the most part. The socioeconomic dimensions of the Tibetan pastoral production systems are also not well know. This lack of information limits the proper management and sustainable development of the rangelands.

In recent decades, nomads across most of the pastoral areas on the Tibetan Plateau have built houses for themselves and shelters for their livestock, usually in the traditional winter-spring pastures where they may spend up to 6-7 months of the year. As such, the vast majority of nomads are already ‘settled’ and actually have been for some time, although they have continued to graze their livestock in a nomadic manner. The view by many officials that nomads still need to be settled is, in many respects, a misnomer. Unless, what officials have in mind is for nomads to stop their periodic movement to
different pastures throughout the year and simply graze out of a home base every day like dairy farmers in New Zealand do on improved pasture. Given the generally poor experience with settling nomads in other pastoral areas of the world, it will be interesting to watch the process of sedentarization as it unfolds on the Tibetan Plateau. What effect will the grassland contract system have on rangeland condition in the future? Will nomads overgraze pastures that they view as their own property now? What effect will private rangeland and fences have on traditional mechanisms for pooling livestock into group herds and group herding? These, and other related questions, will be important questions to seek answers to in the future.

With current pastoral development policies on the Tibetan Plateau, nomadic herders are being transformed into commercial livestock ranchers. While these developments are certainly improving nomads' standard of living, the long-term sustainability of these large subsidized investments in fences, buildings, and range improvements needs to be questioned. Fencing and barns are expensive, relative to the benefits. Is the huge investment being made in buildings and fences really economically sustainable? Fencing is a valuable tool for managing livestock use of grazing lands, but fencing can also restrict movement of livestock which can lead to overgrazing. Rangeland monitoring programs need to be set up to monitor rangeland condition where fences are being built. Many of the current policies for privatization of grasslands are based on the mistaken belief that traditional pastoral systems did not give nomads any responsibility for the rangeland and that, therefore, nomads tried to maximize herd sizes with no regards to carrying capacity. In fact, many traditional nomadic systems were often well regulated and, in some areas, quite elaborate management systems were in place to periodically reallocate grazing land among herders depending on rangeland condition and livestock numbers.

What can be done to help nomads that lost many of their animals this last winter? Restocking is valid option, but consideration needs to be given to the type of livestock nomads are supplied with. In many areas, yaks will probably be the animal preferred by nomads, but restocking with sheep and goats, at least initially to provide a base of production for nomads, should not be ruled out. Nomads need to be active participants in any decisions made about animals provided for restocking and their knowledge of which animals are best suited to local conditions needs to be considered.

Animal husbandry will continue to be the major land use for much of the Tibetan Plateau. In fact, for many areas, extensive livestock production is the only mode of production to support people. The key to improving livestock productivity centers on providing animals with enough forage throughout the year. The winter and spring are the main forage deficit times and more attention needs to be directed towards providing more forage, either in the form of grazing or from hay that is made from native grass or artificial pasture. Growing artificial pasture for hay is a fairly simple technology that could provide additional feed to improve livestock productivity and/or, in the event of heavy snowfall, help prevent large livestock losses. Fencing pastures to reserve areas for
livestock grazing in the winter and spring is another option, but the economics of fencing still needs to be properly assessed.

Improved pastoral production in Tibetan nomad areas requires that ecological principles regulating rangeland ecosystem functions are linked with the economic principles governing livestock production and general economic development processes. New perspectives emerging on the non-equilibrium dynamic nature of rangeland ecosystems and innovative, pastoral development paradigms that actively involve nomads in the development process also suggest new possibilities for and fresh approaches to working with Tibetan nomads. There are no simple solutions to addressing pastoral development in the harsh environment of the Tibetan Plateau and due to the multifaceted dimensions of the problems, actions will need to be taken on several levels: at the central policy level; at the university and research center level; at the level of range and livestock extension services, and at the nomad level.

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