

DEVELOPMENT AND THE ENCLOSURE MOVEMENT IN PASTORAL TIBET SINCE THE 1980s

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Abstract

This article discusses the implementation of development policies in pastoral areas of the Tibet Autonomous Region (TAR) since the reforms of the 1980s. It analyses why certain kinds of interventions – particularly fencing – have been introduced. The rhetoric and reality of markets, technology, degradation and land tenure in the reform era are put into ecological, historical and cultural perspective. The causes and potential consequences of widespread fencing are also considered and, based on these trends, the article speculates on the future development trajectory of pastoral areas in the TAR.

Keywords: degradation, development, fencing, land tenure, markets, reforms, Tibet

Introduction: China's Economic Reforms Come to Tibet

The post-Mao economic reforms engineered by Deng Xiaoping came late to the Tibet Autonomous Region (TAR), as had many of the policies and political movements initiated by the Chinese Communist Party (CCP) during the twentieth century. In 1980, Party General Secretary Hu Yaobang led a high-level 'Working Group' to survey conditions in the TAR. Far from impressed, Hu pointedly criticised the Party's performance. The tour resulted in a damning report that equated China's own rule over Tibet to colonialism, and urged that relief measures and resources be immediately released for development there (Shakya 1999).¹ Later that year, the People's Republic of China (PRC) initiated a policy known as 'reform and opening up' in the TAR. Among other things, this policy involved a tax amnesty for farmers and nomads, withdrawal of many Han cadres from the administration, and the rehabilitation of educated and high-status Tibetans (Diemberger 2000). These were the first of many significant shifts that culminated in the dissolution of communes and privatisation of collectivised property such as livestock.

The state had reason for anxiety with the coming of reforms, and not just in Tibet.² Taking the unprecedented step of privatising a centrally planned socialist economy, the Party risked losing its leading role in Chinese society. Some observers have argued that the sheer volume and speed with which communes were privatised after 1978 belies the notion that the Party initiated or was in full

control of decollectivisation (cf. Croll 1994, Yep 1998, Oi 1999). Instead, this argument goes, the announcements of reform were a *de facto* endorsement by the state of the lead already taken by China's peasants.

Yet, the tenor and direction of political, social and economic change in Tibet has been more tightly controlled than other parts of mainland China. While the informal privatisation of communal property was well under way in other parts of the People's Republic, the communes remained intact in the TAR until the 1980s (Goldstein and Beall 1991). Still, once reforms began, the state apparatus in Tibet quickly adopted the propaganda and policies emanating from Beijing, with Tibetan cadres dutifully broadcasting Deng's promises of reforms and 'the glories of getting rich'. These ideas were based on the economic assumption that production in the rural sectors would increase if the market's potential was unleashed and science was introduced to modernise traditional practices. In the sections that follow, we will see how these reforms played out in pastoral townships in Tibet.³

Study Area

This research was conducted between 2002 and 2004 in the TAR. Most of the evidence that supports this paper is drawn from translated government documents and interviews in Porong Township (Nyelam County, Shigatse Prefecture). This township is situated just north of the Himalayas that form the boundary between China and Nepal; Mt. Shishapangma (8,013 m), the world's fourteenth highest peak, falls within the borders of this basin, which drains into Peiku Tso lake (latitude: 28° 21' N, longitude: 85° 47' E). The township is located in the buffer zone of Chomolongma (Mt. Everest) Conservation Area and the southern road to Mt. Kailash passes through the area. According to Nyelam County government documents (Nyelam County 2003), the average altitude of Porong is 4,300–4,600 m, average temperature is 0.70 °C, and annual rainfall ranges between 200 and 236 mm. Porong Township is the largest animal husbandry production area in Nyelam County and comprises a third of its land area. Local cadres reported in 2003 that the total numbers of animals was 54,065 (6,643 yak and cattle; 37,789 sheep; 9,157 goats; 476 horses). There are nine administrative villages containing some 380 households, with a total population of just over 2,000 people; average per capita income was US \$228 (also in 2003).

In addition to research in Porong Township, interviews were conducted in pastoral areas of Nag Chu and Lhasa Prefectures, as well as the urban centres of Lhasa, Shigatse and Nyelam.

The Reform Era Comes to Pastoral Tibet

According to informants in Porong Township, privatisation was announced in 1981 at a meeting of all the commune leaders within Nyelam County. Everyone was given documents stating that the townships could choose between privatisation and continued collectivisation. The leaders returned to their communities and presented villagers with their options. Not surprisingly, these pastoralists decided to go the road of privatisation. A village headman put it this way:

During the commune, lazy people were happy. The leaders didn't know how to motivate them. Overall, life was not good. We weren't happy. During the first years of the communes we had good results. But after a few years, people stopped completing work assignments. Good workers lost motivation and production decreased. People didn't take responsibility. They didn't care. The leaders also cared less. The collective property – like ropes and barley bags – kept getting neglected or stolen. Our village got poorer and poorer. Then we broke the 'iron bowl' and that was very good.⁴ If that hadn't happened, we would have lost all our animals. After privatisation, things improved. People took responsibility and worked very hard.

But the proclamation of privatisation did not guarantee its timely implementation.

After the reforms were announced in 1981, a group of village leaders from Porong travelled to the county headquarters to seek approval for dismantling their work teams and redistributing livestock. But their requests were stymied and only one work team was given permission to do so. This delayed start may be attributed to the initial problems faced by the government in actually implementing the decollectivisation of animals. At first, the privatisation policy was described as a 'lending system'. It left ambiguous how long these animal loans would last: the result was that many animals were quickly slaughtered by pastoralists. An all-county meeting was subsequently held – livestock would henceforth belong to households. A former commune leader recalled a government official saying:

Before, we loaned the animals to you. Now we are giving them to you. We won't change this policy for a long time.

In this manner, the 'complete responsibility' system was announced and the PRC instituted sweeping reforms to its administration of Tibet's pastoral economy by dismantling the communes and privatising livestock. Animals were divided according to the number of members in each household (i.e., infants, children and seniors received the same share as adults). The actual distribution of livestock was carried out by village headmen and county policemen – an interesting combination of legitimisation through traditional symbols of authority and the state's threat of force. Local informants reported that this division of livestock was closely scrutinised by community members and widely perceived to be fair. Along with these moves, the commune work teams and production brigades were dissolved and

reorganised into smaller units that better matched the scale at which livelihood actions had been organised prior to the 1950s. The three former administrative levels – the commune, production brigade, work team – were replaced by the township, administrative village and natural village, respectively (Ho 2000, 2001).⁵

‘To Get Rich is Glorious’: The Push for Greater Production and Market Specialisation

A set of documents published by Nyelam County government during the 1980s is illustrative of the period after reforms. These documents are discussed below.

One of the government’s main tools of public education during the reform era was the mass distribution of booklets to village-level cadres; in turn, these leaders were directed to hold meetings and read to villagers from these edifying brochures. A senior official gave the author one such booklet, published in 1984, to review and photograph. The booklet, entitled ‘*Examples of the Nyelam County CCP Leading the Masses to Change from Poor to Rich*’, was subsequently translated. This booklet provides narrative accounts from different townships in Nyelam County: tales of individuals who had gone the way of privatisation and succeeded. Each essay gives examples of peasant families who introduced new technologies that dramatically improved their production and their incomes. A selection of titles exemplifies the gist of these essays:

- *Dram Township has gone the path of the rich by diversifying its economy*
- *How Sholbargang village changed immediately by using science to support livestock production*
- *Tsangling Township increased production by threefold*
- *The Communist Party’s get rich policy helped the family of Uncle Dragpa grow golden wings*

During this period, the Party was at pains to emphasise its vanguard position and these essays consistently seek to reinforce the impression that the CCP was still forging the people’s path to a better life. Is this rhetoric accurate, though? Did the Party-state lead Tibet’s pastoralists to privatisation? The 1980s essays provide a springboard from which to compare the state’s rhetoric with the reality of pastoral townships since the reforms. A lengthy quotation is offered from one of these essays, to give the reader a feel for these documents and to explore some of the claims that the government made in relation to pastoral Tibet.

‘How Sholbargang village changed immediately by using science to support livestock production’

The initiative of the masses is unprecedented and everyone is active using the Communist Party’s flexible policy of the Household Responsibility

System. When they have this initiative, everything is possible to get economical results and they are practising the way to get rich. To develop pastoral production, people are most important, as we can see from this case. Now they are using fine breeding and they have turned to the way of business ... Compared to last year there was an increase of 73.7 per cent in income because they attached importance to the scientific method of raising animals. The Household Responsibility System is being perfected, science is being used to raise animals and the people's level of knowledge is increasing. In the future the people of this village will get rich.

As this quote illustrates, initiative and hard work are basic tropes in these essays: a model peasant, for example, was one who took up a sideline of raising chickens, ducks or pigs to sell in the regional markets that developed (or re-emerged) quickly after reforms in the PRC. But what of pastoral areas in Tibet? Were such sideline activities viable? Did markets develop after the economic reforms? Was there even a market to be had in pastoral Tibet?

Certainly, the population of Tibet has increased in the past fifty years (Gruschke 1997, Fischer 2005). Increasing population in rural areas, however, did not necessarily translate into greater market opportunities; in fact, demographic growth in rural areas may have simply meant greater subsistence demands among larger families. On the other hand, the growth of urban populations has led to a rise in demand for livestock products. But these markets are practically accessible only to those pastoralists who can find means of transport, live in close proximity to these centres, and have the necessary business networks to dispose of goods. Yet Tibet's transport network is designed around military and security needs first and secondly for travel between urban centres (e.g., Naqu, Lhasa and Shigatse), rather than connecting small villages with each other (Karan 1981, Bauer 2004).

Although the privatisation process aimed to introduce competition in livestock marketing, a small number of monopolies control these markets in Tibet's major urban centres. For example, in the TAR's two largest cities (Lhasa and Shigatse), the meat markets are run by Chinese-speaking Muslim merchants from Gansu and Sichuan Provinces – a major barrier to Tibetan-speaking and economically marginalised pastoralists seeking to sell their goods in urban markets. Regional markets, in turn, operate as satellites of larger urban areas. For example, Tibetans from Damshung (Lhasa Prefecture) control the meat market in neighbouring Naqu Town (Naqu Prefecture) (Richard 2005). As such, the reform-era benefits anticipated as a result of growing markets have not accrued to the vast majority of Tibet's pastoralists.

Specialisation has also been put forward by state and international non-governmental organisation (INGO) planners as a means to develop and modernise pastoral production. For example, cashmere – the fine wool of the Tibetan goat – holds promise as a speciality product.⁶ But the processing centres and marketing networks for these higher-value products are controlled by non-Tibetan businessmen, with revenue streams flowing out of Tibet rather than towards rural

pastoral areas (Fischer 2005). The government also hopes that rural residents can earn more from other kinds of business operations and sideline products. In a county like Nyelam, a few entrepreneurs can indeed trade in high-value items like silver or otherwise sought-after goods such as tea, clothes, packaged foods, and thermoses. However, such specialised trade is also dominated by relatively few traders and lack of start-up capital is a major constraint.

Developing alternative sources of income has been put forward as a solution for the pastoral sector of the Tibetan economy. Off-range employment could, the argument goes, ease the cash bottleneck nomads face and encourage consumption. In 2004, the TAR Statistics Bureau director estimated that per capita income among herdsmen in the TAR would reach US \$224, 22 per cent higher than the previous year (TIN 2004). But do these governmental claims bear out in pastoral communities?

In their annual work directives, Nyelam County officers are given explicit instructions to promote employment as a way to increase pastoralists' income. One township leader stated that, out of nine villages under his jurisdiction, perhaps a third of the labour force travels outside for work at some point in the year. Indeed, any traveller who plies the Plateau's roads can verify that, during the summer months, Tibetans are employed by the score to construct and reconstruct its high-altitude transport network. Unskilled manual tasks such as filling in potholes and carrying rocks are typical jobs performed by these road crews for 2–3 dollars a day. However, access to this kind of off-range employment is, ironically, a matter of access to roads.

Regardless, the numbers of scattered Tibetan road crews pale in comparison to those hired for construction of the world's highest railway, currently being built from Qinghai Province to the TAR. Yet, according to the PRC's deputy railway minister, only seven hundred Tibetans are among the twenty-five thousand migrant labourers building the railway (McDonald 2002). Government officials claim that the railway will redress the huge and growing gap between landlocked, isolated western provinces and the booming cities of China's east, whose ports give them ready access to export markets. But this railway will only reach the city of Lhasa and a narrow, northern corridor through Naqu Prefecture. Nomad entrepreneurs living in areas adjacent to the railroad may gain – for example, selling meat or other livestock products to train passengers – by way of increased linkage to mainland China. However, if other trends hold true, the consequence of greater connectivity will be the increased migration of non-Tibetans from provinces such as Qinghai, Gansu and Yunnan. These economic migrants from densely populated, highly competitive areas will further monopolise the trade and employment opportunities made available by this 'railway to heaven'.

Arguably, today's asymmetric economic and political structures will continue to work against illiterate, non-Chinese speaking and poorly capitalised Tibetans (Fischer 2005). And for pastoralists living beyond the railway's main corridor, its promised markets will remain distant and out of reach. Moreover, securing higher-

paid, skilled work is a function of employable skills that pastoralists seldom have. A dearth of vocational schools in the TAR has been consistently noted by government officials and INGOs as a major constraint to developing job skills among rural Tibetans. A literate monk put it this way, 'Village people are not skilled enough to go and work in cities. Only a few of us can read or speak a little Chinese.'

As livestock markets have been slow to develop and chances for off-range employment remain slim for most Tibetan nomads, there is an acute shortage of cash in the countryside. According to one Tibetan INGO employee, interest rates for ordinary entrepreneurs and producers are high; access to credit through government schemes is limited, at best. With the retraction of state subsidies that accompanied reforms, fuel costs have risen, further constraining the development of regional markets. Meanwhile, livestock products have not seen rises in prices to match increasing costs for inputs like veterinary medicine and transport.

In sum, the rosy picture painted in government publications concerning the boons of 'unleashing' market forces only faintly applies to the situation of most Tibetan pastoralists. They continue to produce very much along historical lines, particularly in terms of technology, herd composition and culling practices. At present, land use and stocking decisions among Tibetan nomads appear to be aimed more towards increasing reliability and minimising natural and economic risks than maximising profits per se (Edström 1993, Roe et al. 1998). Interestingly, research has found that ranchers in the USA, too, strive less for profits than to maintain their lifestyle (Rowe et al. 2001, Torell et al. 2001, Walker and Janssen 2002).

Modernity's Anodyne: Deliverance from 'Degradation' Through the Application of Science

The state's claim that it would deliver the market to Tibet's pastoralists in the 1980s has been contested above. But let us return to the privatisation essays to learn how else the government proposed to help nomads get rich in the reform era. Beyond hard work and fearlessness, *the* critical input to catalyse increased production was to be science. A sample of the rangeland literature produced by and for the Chinese state reveals that science is presented as the panacea for the malaise of Tibetan pastoralism.

After some years of using scientific methods, the village has achieved good results. Using science to raise livestock, they were able to get rich. So they have emerged from poverty ... Before, the people were ignorant about raising livestock and abused the animals. Before they freely mixed all the animals in one grazing area without a plan and without limiting numbers. They were only thinking about numbers. They didn't care about quality. They were just thinking about subsistence, even if they did not have quite enough. Now they use a scientific system of herding animals. Animal numbers, animal quality, offspring mortality rates – these have yielded unprecedented results because they use science. (Nyelam County 1984)

The implication here is that the existing system of production was inefficient, despite the fact that Tibetan pastoralists had exploited rangelands for millennia in an environment with a punishing climate, short growing seasons and high altitude.

Degradation is the dominant framework within which government officials and 'experts' from international organisations discuss Tibet's rangelands.⁷ Many policy-makers and development workers have adopted a generic, globalised framing of Tibet's pastoralists, wherein livestock numbers are too high – the result of 'illogical' and 'backward' practices. A senior government professional in the Animal Husbandry Bureau described the situation of pastoralists in this way:

The main problems are human and animal populations. Because of our special status, Tibet has not had birth control. So nomads can have nine children. Before a family might have had five hundred sheep. Now more children live and every child needs his own herd with two hundred sheep. So now we have many more sheep. Before liberation [1951], Tibet had five million livestock. Now there are fifty million.

In such characterisations, rangeland users are putatively operating within a 'tragedy of the commons' scenario. Here, degradation of rangelands is man-made, caused by inadequate institutional arrangements and anachronistic cultural customs. According to these arguments, traditional grazing systems are unscientific and not sustainable. Such representations reinforce the view that ignorant herders are the primary agents of grassland degradation.

The discourse of degradation illustrates the power of science to construct knowledge, in this case about environmental issues.⁸ This discourse – disseminated in the forms of government policies and 'expert' reports, conference presentations, official speeches and bureaucratic regulations – perpetuates the state's representation of itself as powerful, effective and benevolent. In touting the improvements that science will bring, the government's case for intervention is strengthened. A dialectical straw man – the 'traditional' nomad – is placed opposite modernising science, that great historical interdiction to backwardness; the government must, by implication, come forward with policies to 'modernise' animal husbandry.

Rangeland deterioration is described as a technical and institutional problem, for which the state must provide answers. According to the government and INGO view, in order to transform the Tibetan plateau into a 'prosperous modern livestock base' (Gélek 1998), 'rational' and 'scientific' planning must overcome pastoralists' patterns of production, which tend inevitably towards degrading rangelands. The consistent political message has been that pastoral communities require intensive administrative control in order to develop and modernise. Backed by scientific language and reasoning, state planners use the discourse of land degradation as a pretext to impose technological fixes that result in increased social control: such a sketch of the Tibetan body politic would follow Foucault's eponymous concept of 'governmentality' (Foucault 1972, Foucault 1980; see also Yeh's arguments about green governmentality in this issue).

Government documents describe the need to 'construct grasslands', as if grass, soil and water could be mechanically mixed, moulded and made easily into rangelands. But we should make explicit some of the assumptions about degradation in China: first, that knowledge of land degradation is objectively measured; second, that the current government can justifiably deflect culpability for the crisis by blaming others; and third, that rangeland enclosure policies will save the grasslands. Scientific pronouncements carry authority, even though we hear little about the methods by which conclusions are derived, including potential flaws in estimations. Despite their seeming gravity, and the sense of legitimacy bestowed by quantification, government and INGO reports rarely offer clear definitions of degradation or clarify why specific pastures are deteriorating.

And there are alternative hypotheses about the causes of degradation – assuming that it does indeed threaten rangelands in the TAR. Case studies from Central Asia suggest that pasture degradation is associated with the loss of mobility in pastoral systems (Williams 1996 and 2002, Humphrey and Sneath 1999, Wang and Wang 1999, Sneath 2000 and 2002). During both feudal and collective periods, pastoral movement was facilitated by large, herd-owning institutions (Sneath 2000). One of the effects of de-communisation, then, was to reduce the spatial range of movements undertaken by pastoral households. Ironically, the TAR's nomads have become both more and less mobile. On the one hand, individuals (especially men) have gained mobility through greater access to roads, buses, lorries, motorcycles and other transport, particularly in the reform era. On the other, Tibetans are increasingly marginalised and excluded from effective participation in the economy and so languish in rural areas with growing populations and declining resource productivity (Fischer 2005).

Clarke (1986 and 1987) argues that degradation on Tibetan rangelands is localised and severe in peri-urban areas, around resource extraction points and in areas of major development. For example, the spatial pattern of transport infrastructure development in Tibet has placed markets close to roads and thereby concentrated grazing along these corridors. Products and services pass in and out of these nodal points, creating localised environmental pressures that may ultimately undermine the environmental viability of pastoralism. As such, permanent settling by Tibetan pastoralists in winter grazing areas may have reduced once larger grazing orbits, even if seasonality of livestock movement remained consistent.

As we have seen, current Chinese government policy rests on the idea that rangeland resources are being squandered. Amelioration of this situation requires institutional change, specifically land reform in the direction of privatisation. The way posited to prevent degradation and enhance pastoral production is to strengthen the 'pasture contract system,' which privatises rangelands and assigns plots to households. In theory, the implementation of this contract system takes place in three phases: (1) official assessment of township and village rangeland boundaries; (2) issuance of pasture use contracts by the county government; (3)

distribution of pasture contracts to individual households or joint units within an administrative village (Ho 2000).

Since the 1980s, then, the central government has attempted to convert extensive range systems of grazing throughout pastoral China into more intensive production regimes based on enclosed pastures, irrigated forage production and improved breeding (Clarke 1987, Williams 2002). In the Tibetan context, enclosure by fencing has been the widest spread means of achieving these ends.

The Push for Ranching and the Fencing of Tibet

A tool that physically, socially and symbolically demarcates territory, barbed wire fencing has seen expanding use in pastoral areas of China since the 1950s. It was first used in Inner Mongolia, following the example of the USSR's collectivisation of Mongolia and subsequent fencing of fodder pastures. Barbed wire then made its way through other pastoral areas in Ningxia, Sichuan, Qinghai, Gansu and Yunnan. Enclosure with fencing began in Tibetan areas of Qinghai, Gansu and Sichuan Provinces during the commune period. The first fencing in the TAR was installed during the 1960s in the Damshung Valley, north of Lhasa, due to its proximity to the regional capital and the convenience of using this pastoral area as a 'model' demonstration area. In the mid-1980s, fencing in winter and lambing pastures spread quickly; increasingly, summer grazing lands are also being fenced. In fact, China's tenth Five-Year Plan put forward the goal of fencing an additional 150 million *mu* (10 million ha) of pastures (Government sources, cited in Miller 2001).

Fencing is seen as the most effective development intervention in pastoral areas, based on an economic logic that assumes if people own their land, then they will invest more resources in managing, improving, or conserving it. Economic arguments have been prominently employed to rationalise land tenure policies. Government policy-makers have reasoned that privatisation will increase users' incentives to invest in better management because individuals lacked incentives when operating on communally owned grasslands (Miller 1998). International development organisations, too, have directly and indirectly influenced the discourse of privatisation and the push for enclosures.⁹ Ho (2000) argues that privatisation of land tenure fits within the larger modernisation framework of free enterprise and entrepreneurship strongly advocated by the World Bank and the Chinese state.

Fences are the most common and, seemingly, favoured mode of pastoral development in the TAR. The word 'mode' is used deliberately, since fences are not just a simple matter of strung wire and rows of iron posts. Foucault (1972) and his followers argue that technology is not neutral and must be seen as intertwined with projects of surveillance, control and power. Development interventions are not merely attempts to provide technical solutions for production constraints (cf. Salih 1990). In this vein, fences can be seen as a political activity that expresses the nature

of governance and the dominant values in the culture. Razac (2002) argues that the history of westward expansion in the American West and the use of barbed wire show that fences entail not only physical changes to a landscape, but also political and social consequences with which we must reckon. Fences are a way of marking boundaries and managing grazing. But they also imply a certain relationship between production units, communities, natural resources and governance.

Williams (2002) argues that enclosures constitute the final phase of a long historical process in China, by which the central government has tried to sedentarise – and thus more fully control – mobile herding populations at the nation's periphery. Smith (1996) and Gefu and Gilles (1990), among others, argue that enclosure policies are motivated from a desire to exert political control over nomads and to assimilate them. Given the rapid and accelerating proliferation of fencing in Tibetan pastoral communities, it is important to consider such critiques. Yet, it is necessary to weigh this Foucauldian analysis against empirical examples from today's TAR. Do these theories adequately capture or frame the economic, political and social dynamics at work in pastoral areas of the TAR?

Views of Fencing: Academics and the State

Critiques of fencing dismiss the benefits attributed to barbed wire. The results reported in scientific experiments are conducted under controlled conditions, where livestock are excluded. But such practice cannot be broadly replicated if a majority of pastoral households begin to enclose grasslands. Fencing, if managed properly, will increase standing crop biomass but not necessarily rangeland productivity, depending on the initial conditions of the site (Richard 2005). On the rangelands of the Tibetan Plateau, the first order controls on productivity are more likely to be factors such as snowpack and available soil moisture (Klein 2003).¹⁰

In Central Asia, shifting from subsistence pastoral production to a market-driven ranching system depends on controlling access to, and increasing the productivity of, winter pastures. In pastoral regions on the Tibetan Plateau, winter pastures support two-thirds of the year's grazing but account for only one-third of total available rangeland area (Ning and Zhaoli 2002). In regions like the Tibetan Plateau, winter storms act as a natural mechanism of population control. By aiming to provide more fodder for animals during the cold season, policies that encourage the enclosure of winter pastures and subsidise inputs of forage from other regions into marginal pastoral areas may actually accelerate degradation – especially in non-winter pastures – as more animals survive (Kerven 2004). This, despite the fact that more animals surviving does not necessarily mean more robust or more productive animals. The effect may, instead, be that a greater number of weak animals survive, breed and provide poor quality products. Nevertheless, since the 1980s, the government has heavily subsidised the fencing of winter pastures throughout the TAR.

These arguments aside, it is important to consider the social implications of fencing as we survey the effects of planned state interventions in the TAR. Critics have argued that fences are socially divisive and exacerbate the disparities between the have and have-nots. For example, Yeh (2003a) and TIN (1999) report an increase in communal conflicts over boundaries and fences in eastern Tibet. A Tibetan from Qinghai Province – an area that has seen extensive parcelisation of pastures at the household level – saw it this way: ‘Only if a family is poor and can’t afford it, you see no fence. These families’ pastures are grazed by the herds of others.’ As another interlocutor from the eastern Tibetan Plateau revealed, fences can intensify tensions over resource use within and between communities: ‘Fights over fence lines are very common. And hay theft happens all the time – people sneak into each others’ pastures at night to cut grass.’

Critics of fencing raise another socially centred issue when they point out that fences can act as a force of division within communities where land management has relied on unity of action in livestock movements and resource use. Another dimension of the social divisions resulting from fencing is on a landscape scale. Generally, fences break up a heterogeneous landscape crisscrossed by trails, streams and other resources that every member of a pastoral community requires. Water, in particular, is a critical resource from which users are cut off with the parcelling of landscapes and the application of fences.

Fencing has been criticised as socially divisive, exacerbating class differences and, finally, ineffective. This article asks: is fencing the product of planned policies to sedentarise – and thereby better control – pastoral communities in the TAR? Or, is it the most expeditious way for the government to provide infrastructure for livestock production in marginal and remote pastoral communities? Regardless of these arguments, most of the nomads met during fieldwork spoke passionately of their *need* for current fencing and even for more fencing. If all these social and ecological ills inhere to fencing, why would these Tibetan pastoralists – those whose livelihoods depend most directly on workable labour arrangements and sustained range productivity – be asking for more?

Fencing, State Policies and Administrative Practices

Thus, the question of fencing is complicated, and the argument should not be quit by accepting an interpretation that sees the Chinese state as a monolithic and seemingly all-powerful entity in relation to pastoral communities at its margin. Where fencing has been or is being installed, what do pastoralists and cadres at the township level actually think about this intervention? How do they discuss the benefits and drawbacks of this transformative technology? Based on interviews with nomads, government workers and INGO consultants as well as observations of pastoral areas in Tibet and Nepal over more than a decade, it is argued here that the real momentum behind fencing we observe in Tibet is the result of: (1) the

incentive structure for township and county officials; (2) the imperative that local government bureaux raise their own revenues; and (3) pastoralists actively engaging the development apparatus, using gainful strategies to wrest material benefits from the state. An important point to make with regard to fencing is that various local governments in Tibetan areas have implemented enclosure policies quite differently. A little remarked-upon phenomenon is the divergence in fencing patterns between pastoral communities of the TAR and those of Gansu, Yunnan, Sichuan and Qinghai Provinces (but see Zhaoli et al. in this issue). In these other provinces, fencing is common, if not ubiquitous. Fences most often enclose private plots along roads and near administrative centres – where extension workers have pushed them; more remote areas retain communal control over pastures and accordingly fence larger spatial units (Richard 2005).

Meanwhile, inside the TAR, fencing is far less common and the vast majority of fences are used to enclose communal plots. Moreover, government subsidies of fencing in Tibetan areas outside the TAR have been far lower. The government as well as INGOs have typically fully subsidised the cost of fencing in the TAR since the 1980s and only required local community members to provide free labour to install the fences. This situation may be changing throughout the TAR, if its largest pastoral region – Naqu Prefecture – is any indication. For herders there, fencing is no longer free and locals are required to pay partial costs, even for large projects, such as those sponsored by the Poverty Alleviation Office.

A parallel example further illustrates this point of divergences in policy implementation between Tibetan areas. Houses in pastoral areas outside the TAR are today built with private money, without government subsidy. This stands in marked contrast to the TAR, where subsidies are available to, if not forced upon, local populations so that they settle and build houses. Not surprisingly, PRC documents consistently and explicitly state that the central government's policy towards TAR is 'special' and 'privileged'.

To what can we attribute the differences in governance between these areas? Historically, regions like Kham and Amdo followed quite different trajectories than central and western Tibet in terms of their relations with various Chinese ruling regimes, latterly the CCP. The implementation of the Communist Party's policies in the eastern Tibetan areas came earlier and was, arguably, carried out more thoroughly and radically. Furthermore, there has been more and closer interaction – commercial, political and cultural – with the Han, as well as Hui and other minority nationalities in the Tibetan-populated areas of Gansu, Yunnan, Sichuan and Qinghai Provinces. These, in turn, were assimilated into non-pastoral models of land tenure, economic production and household structure more systematically than in the TAR. Moreover, it should be noted that in areas of the eastern Tibetan Plateau which receive more precipitation than central Tibet, pastures are more productive and may therefore subject to greater competition in claims; demographic density is also higher, which has lent momentum to enclosure of household parcels on the eastern Tibetan Plateau. The fact that

pastures were parcelled out to households by cadres in Kham and Amdo (Sichuan and Qinghai Provinces) as opposed to communal units, as in the natural villages and townships in the TAR is, therefore, not surprising. The benefits of group tenure in a pastoral setting – particularly in a marginal environment such as Porong, where less than 250 mm precipitation occurs annually – include the economies of size achieved with respect to herding labour: group tenure represents the lowest-cost institutional arrangement for facilitating this, particularly in the absence of markets for grazing rights (Dalhman 1980, Stevenson 1991, Baland and Platteau 1998).

According to one well-placed Tibetan, when the reforms were announced at the TAR People's Congress, there was a lengthy discussion of the tenure of grasslands. Village-level representatives had raised concerns about the division of pastures to the household. There was, in other words, concern at a high level of government for the potential social divisiveness that could result from dividing pastoral land. The candidates to the congress no doubt anticipated what it would mean to privatise Tibet: a difficult and consuming campaign of surveying land and settling disputes across a swathe of rugged range. Both households and cadres, it seems, continued to have vested interests in pooling and maintaining resources and government services at the natural village level (cf. Croll 1994). Even in areas outside the TAR, Banks et al. (2003) observe that collective and group tenure arrangements have persisted despite attempts to allot land to individual households. Thus, while land was parcelled out to private entities on paper, herders continued to use pastures in common and entrusted regulation of rangelands to communal entities.

Another critical factor that explains the contrasts between the implementation of central government policies in the TAR and other pastoral regions is, quite simply, timing. Though the first TAR Grassland Law was passed in 1994, government and local informants alike reported that it was not until the most recent revision in 2002 that these land management laws were implemented. Critically, these revisions included a provision that permitted grasslands to be distributed not just at the household level (in congruence with other aspects of the Household Responsibility System), but also at the natural village and administrative village levels. Subsequently, the great majority of pastoral communities in the TAR have chosen to administer pastures at the village level.

An important question to ask is whether these time lags in policy implementation were deliberate (i.e., the central government exercising caution in a restive minority region), coincidental (i.e., inept or slow management), circumstantial (i.e., manifestations of the diffuse reach of a state) or political (i.e., the Tibetan People's Congress was effectively exercising autonomy)? Or, was a combination of all these forces at play?

Fencing On the Ground

The case of Porong Township can illustrate how the ecological, social and political dynamics of fencing play out on the ground. The oldest fence in this pastoral community dates back twenty years. This small winter fodder plot was put up by the labour of local villagers drawing on government funds. Like other pastoral townships, members of Porong's work teams had been compelled to erect stone and sod walls around pastures during the commune era (1969–1980). These walls are today invariably crumbling and not maintained. Conversely, fences are frequently repaired and expanded if possible. The differences have to do with technology and the terms under which these two types of enclosure were built. Fences are a simple and sturdy technology that can be put up in a matter of days. With proper equipment (a tractor, rolled barbed wire, tools), hundreds of hectares can be fenced quite quickly. In contrast, stone and sod walls must have been exhausting and time-consuming to build (much less maintain). Moreover, harvesting sod breaks down the root systems of grassland turf, making soil more erodible and causing extensive damage to rangelands. Finally, commune era walls were built under duress (i.e., commune members were assigned to build walls), and required labour above and beyond the work commune members had to perform in order to earn points and a ration of food and other necessities. The result today: as commune walls crumble, fences are multiplying.

In 2003–2004, more than 4,000 ha of rangeland were newly enclosed by Porong villagers with fences purchased by the government. Evidently, pastoralists have actively cooperated with the government in erecting enclosures for two decades – revealing a situation quite different from the picture painted by critics that fencing is compulsory. Still, can we discern an agenda of regimentation and control in the government's advocacy and funding of barbed wire?

Here, a finer grain analysis of the state illustrates why seeing the state *without* seeing the individuals who act – be it in self-interest, self-defence or self-abnegation – as its agents misses an important part of the picture. Scott (1985, 1998) and others (Gellner 1983, Anderson 1991) have highlighted how nationalist projects draw on the symbols of modernity – technology and consumption, for example – to construct for citizens not only an identity with the nation but also a destination. While this paper highlights the importance of mid- and low-level actors in the making and implementing of pastoral development in Tibet, national narratives *do* play a role in this progression of policy and praxis. For example, parallels can be drawn between the United States' claims of 'Manifest Destiny' and the settling of its western territories and China's Great Leap Forward and the development of its western provinces. In both cases, fences figure prominently in the transformation of landscapes and land management.

Our models of pastoral development in China must account for the motivations and the constraints within which township and county government officials proceed. The first explanation raised in connection to the momentum behind

fences, then, has to do with the incentive structure of local-level government officials. Bureaucracies reward bureaucrats based on quantifiable performance indicators, such as annual increases in production (Strathern 2000). A member of the Nyelam County Animal Husbandry Bureau (AHB) described the rewards system within which township cadres operate:

How do I judge their performance? Every year, the township leaders submit their work reports. We look at these reports and see if there has been an increase. How much butter and cheese did they produce? How many baby animals lived? How much did incomes go up? Then we have a big meeting and banquet – this is where we announce the best performances. We give prizes [cash] and a big red banner to that township.

In a system where government officers are rewarded for progress measured in numbers, fencing fits in well. Fencing is easy to quantify: you can measure how much land has been fenced in a given period; you can buy, deliver and install it in a fiscal year. For instance, in Porong Township, more than 1,300 ha were enclosed with fencing after just a week's labour by a volunteer, non-professional work crew of community members.

The results of fencing are quantified by government officers not only in relation to how much area has been enclosed, but also in terms of biomass production – a neat extension of the state-supported ideology in praise of 'science'. For example, one township document (Nyelam County 2002) claimed that building 241 winter shelters for animals would result in the following effects on animal health and rangeland productivity:

[We will] decrease the livestock mortality rate by more than one-third annually. It will reduce economic losses by RMB 120 million. [We will] eliminate the loss of 30,000 m³ of sod and increase the amount of fresh grass by 3163.5 kg. In the meantime, the size of pasture will increase and the ecological environment will be conserved.

Such reports illustrate how one quantified variable leads to a quantifiable result in government thinking. Another intervention suited to this incentive structure is veterinary services. Again, it is the numbers of vaccinations, animals surviving and animals born that are recorded, and rewarded, in local government reports.

In practical terms, too, there are incentives to fence: it is a one-off intervention that requires less follow-up than vaccination campaigns, for example. Compared to other development interventions (e.g., irrigation), fencing is relatively easy to deliver and demands less maintenance labour of local villagers and government workers. With a handful of labourers and a tractor, fences can be erected remarkably quickly: installation requires little training, technology or tools – a handful of labourers, a tractor to provide the necessary leverage and tension on fencing rolls as they are stretched between posts, and some simple tools (pliers, wire cutters, hammers, etc).

As such, the incentive structure for government workers encourages interventions like fencing. Even more, government officials are encouraged, if not obliged, to find ways of generating revenue for their work units. This puts Tibetan cadres in a curious position, since the TAR is almost completely subsidised by the central government: more than 90 per cent of the TAR's budget comes from outside this autonomous region. Nevertheless, Tibetan cadres must raise funds to carry out development projects within their local jurisdictions.

Development monies are funnelled through a select few agencies in the TAR, especially the Poverty Alleviation Office (PAO) and the Ministry of Commerce. Consequently, government offices must apply to these higher-level agencies for what are essentially grants to carry out development work intended to alleviate poverty at the local level. A government officer in the Nyelam County AHB related how he solicits projects from the townships in his jurisdiction:

The high government [TAR] gives us plans and a budget. Then the county sends a letter to all the townships asking them to submit proposals for development projects. The township officials then have the responsibility to make sure these projects are completed.

Given the built-in system of rewarding quantitative measures of development interventions (previously discussed), the tendency is for township cadres to take a 'things' rather than a 'process' approach. (Naturally, this is true in many places and not exclusive to China). In other words, the grants for which Tibetan cadres apply are typically designed to fund the purchase and construction of physical infrastructure. For example, the 2004 work plan for Porong Township proposed only two major interventions for funding: the construction of livestock shelters and the fencing of winter pastures, illustrating this proclivity of the developmental state in Tibet's pastoral areas.

Sometimes the money for fencing comes from unlikely sources. The TAR's administrative units have been assigned 'sister' provinces in a revenue-sharing scheme set up by the central government that attempts to even economic disparities between booming provinces of the mainland and the stagnating interior provinces along China's western margins.¹¹ As a result, county-level units in the TAR apply for funding from 'sister' provinces in mainland China, who are obliged by the central government to disburse funds to their poorer 'siblings'.¹² One year, the Sanitation Bureau of Shigatse Prefecture gave Porong Township RMB 10,000 to build a small enclosure. The township leader remembered, 'That same year, RMB 4,000 was sent to us by the sister province to build a restaurant in our township. Instead, we used the money for fencing'.

Consequently, the sources of revenues available to townships in the TAR are both broad and shallow: a township may apply to a wide range of higher-level institutions for development funding but the kinds of planning interventions that get funding are limited. Much, if not most, of the money directed by Beijing to the TAR is channelled through prefectural branches of the PAO. Some of these monies

are provided by the province-to-province partnerships designed to link rich, eastern seaboard provinces to poor, interior provinces, including the TAR.

So, one way for township and county-level government officers to generate 'revenue' – despite the fact that they work in a budget deficit region – is to apply for grants and use these inputs to buy fencing. According to several PAO workers interviewed, there is little accountability between levels for how these monies are spent. Not surprisingly – given the financial and political incentives – the government has gone into the business of making fences. An example is the Naqu Grassland Station, which produces and distributes fencing: the incentive to sell more fences to raise revenues is manifest.

In an environment where the reach of the state is fiscally attenuated in the aftermath of reforms and monitoring mechanisms are weak, the top-down grant structure for implementing development in the TAR creates incentives for the use and spread of fencing as a way for local government offices to 'generate' revenue. Fences may actually be much cheaper at source than the final cost paid in TAR. According to a well-placed source in Nyelam County, the funds set aside for fencing are skimmed at each level of the government. For example, PAO offices at the regional, prefectural and county levels set progressively higher prices for the materials needed to install fencing in a township like Porong. In other words, raw materials such as barbed wire that costs RMB 4/metre when bought from the factory increases to RMB 7/metre by the time it reaches the township. This price just reflects the cost of physical fences and does not include transport expenses. In their carefully kept ledgers of expenditure and revenue, township accountants budget higher than actual fencing costs; unspent funds from 'fence grants' are subsequently reported as 'revenue' at the end of the year.

Transport costs, like raw materials, increase as they move down the ladder of government offices from the TAR level to the township; though it may be supposed that, the more marginal the area of fenced pasture, hauling costs rise with distance to transport. The real economic costs of transporting fencing to the TAR's furthest and prefectures (Ngari and Nag Chu) helps explain the lack of fencing in these most remote and rugged townships. Beyond this, an important (and often unacknowledged) element in the incentive structure for fencing is the profit that individual actors take as money trickles down the system.

Are the Nomads in Favour of Fencing?

The paper has so far explored some of the explanations for why fencing might be spreading in the TAR. Despite all of the potential ills that are imputed (particularly by academics) to this technology, there is also empirical evidence of a bottom-up momentum among Tibet's pastoralists.

An INGO worker in Lhasa was incredulous about the widespread demand for fencing among nomads. Later, she had travelled through the Changtang – Tibet's

great northern plains, a land of seemingly endless open range with nary a fence in sight – to plan a development project among livestock-dependent communities there. She asked community members, ‘What do you need? What do you want?’ She recounted their reply, ‘In one voice, they said, fencing.’

But is this refrain for fencing only an artifice of the Participatory Rural Appraisal (PRA) method employed by government and INGO development workers? PRA as a methodology for gathering information has been heavily criticised as inherently biased (Chambers 1994, Mosse 1994, Cooke and Kothari 2001). In the instance related here, had powerful members in the community coopted the process by vocalising ‘shared needs’ that were, in fact, interventions which would benefit the power brokers? Development – planned social change – can not be a neutral thing. As Ferguson (1994), Escobar (1995) and others argue, development can perpetuate existing political relations and systematically skew benefits on behalf of the powers-that-be.

So, are these requests for fencing a display, a behaviour among a group of rural peasants who have learned how to respond to the questionnaires of development agents? Are we observing a ‘good sense strategy’ (see Yeh 2003b), used by community members to gain goods from the developmental state (and now, in some areas, INGOs)? When local people ask for fencing, is it a calculated response emerging from years of dealing with government interventions, the limits of which they know first-hand? Are they simply resigned to yet another intervention – like communes and the collectivisation of their herds in an earlier period? This paradox was posed to the director of an INGO working in Tibetan areas of China. ‘Fencing in the TAR may not be just a top-down thing,’ he conceded, despite his own misgivings about this method of land management. ‘But it is the consequence of years of policies and pressures that give people no other choice.’

Alternatively, are pastoralists reproducing state discourse in strategic ways in order to access government goods? That is, rather than asking for unrealistic assistance from the government, are local community leaders and township cadres settled on a mutually agreeable use of limited state resources? A critical element of the desire for fencing on the part of nomads is that it represents one of the few concrete benefits that they can get from the government. Indubitably, fencing brings herders a number of immediate and long-lasting benefits, including reductions in shepherd labour; preventing weak animals from starving in winter time; and improving water sources. And pastoralists are willing to invest their own resources – particularly labour – to enclose pastures.

It is important to remember that fencing is not a one-time labour obligation. A well maintained fence is an expression of a certain level of community commitment and by correlation, households’ perception of its utility. In Porong Township and other pastoral areas of the TAR where fences enclose communal pastures, at least everyone has equal access (if not equal use, a function of herd size) to shared resources. Perhaps the mechanism at work parallels that of group tenure in pastures, including economies of size *vis-à-vis* herding labour and maintenance: communally

fenced pastures are a low-cost institutional arrangement, particularly in the absence of markets for grazing rights or rangelands.

The apparent popularity and expressed need for fencing among pastoralists in Tibet seems to belie any simple assumption that we are observing a kind of 'false consciousness' in land management. Given all of this, how do we explain the grass-roots swell for fencing? Perhaps we are observing a bandwagon effect, in which word of innovation spreads quickly over rugged country. Or perhaps fencing has become an emblem, a social totem of progress for pastoral communities? Tibetans are certainly not immune to the attraction of things modern: witness the breathtaking proliferation of products like televisions, mobile phones and motorcycles on the range. Privatisation may be a rapidly expanding concept in China, but one should not equate Tibetan herders' demand for fencing with a desire to privatise and parcel out the Plateau's grasslands. For herders, fencing is an innovation they see as helping them to meet their livelihood needs more reliably. Whether it will or not is another story.

Is Fencing a Response to Climate Change?

An array of Chinese and international scholars have weighed in upon – and are, no doubt, trying to model and predict – the effects of global climate change on the Tibetan Plateau (Miehe 1996, Liu and Zhang 1998, Miehe and Miehe 2000). Dawn Chatty (2005) observes,

All peoples need to manage and adapt to change, and some do it better than others. Pastoralists, because of their special relationship with the land and their animal wealth have a very carefully nuanced appreciation of change and how to manage and adapt to it.

If Tibet's rangelands are drying out, protecting critical seasonal pastures may be a pragmatic adaptation, or more disturbingly, a last line of defence for pastoralists to maintain their lifestyle. In the context of this kind of macro-scale change in the fundamentals of their production system, Tibet's pastoralists are adapting. They are responding to one of the limited means they have available to them – fences.

Another way of interpreting the fencing phenomenon is as a reflection of the eclipse of a frontier – the end of Tibet's open space. Might we see Tibetans as newly conscious of resource limitations and increased competition for rangelands as households and herds subdivide? Perhaps we can draw a parallel between the behaviour of US investors rushing the banks after the stock market collapse in 1929 and the behaviour of pastoralists enclosing rangelands. Roy Behnke (1988) gives a Sudanese example, among an agropastoral group who started to enclose land around boreholes for irrigating hay to be grazed at the end of the dry season (the equivalent of enclosing hay pastures for winter and lambing pastures in Central Asia)

everyone had panicked, anticipating a land shortage, and enclosed huge fallow areas for future use. But like a run on a bank, the panic was self-fulfilling. Those who did not take the precaution of enclosing surplus land subsequently found that they were hemmed in on all sides by other people's fences, and that it was impossible to expand their farms. No one planned to enclose the area; residents say it just happened, the unintended result of each individual protecting his own interests.

Does the gravitation towards fencing signal the dawning of an era in which property relations, especially between townships, are more contentious due to demographic pressure and administrative gerrymandering? The government can exacerbate long-standing historical tensions between communities when it demarcates new boundaries and adjudicates old ones. Or, more simply, does fencing work because it can be adapted to pastoral production in Tibet?

In October 2003, a group of herders were encountered in the Damshung area, north of Lhasa. They were collecting hay as members of a 28-household collective, which has reconstituted at this scale several times in the past fifty years. They were taking down and rolling up a seasonal fence around an area they protected for winter hay. This area had traditionally been protected by moving animals to pastures that now belong to other administrative villages. They explained that with more and more animals and people they have to fence in order to guard their grassland areas.

Traditional resource use boundaries continue to be actively monitored. But since these boundaries are less visible than fencing, they are also likely to be subject to greater dispute and/or negotiation. As such, one of the incentives for fencing may be that it provides a solid, incontrovertible marker of boundaries and removes pastures from the possibility of negotiation. It could be fruitful as well to see fences as a reaction to the state and its now abandoned notions of communisation. We may, in this vein, be tempted to label this an assertion of agency such that pastoralists are seizing on fencing as a means to control resources critical to both economic production and cultural reproduction.

It is important to distinguish where fencing is reorganising locally practised modes of production, and where it is merely formalising and legitimating existing social patterns of resource management. For example, the protection of certain pastures for autumn harvest has been widely practised for generations in the TAR. Whereas pastoral households previously collectively claimed and defended pastures through physical mobility and socially reinforced sanctions, today barbed wire is being used. Fences are then a mechanical means of keeping animals off the same pastures that were traditionally kept free of livestock in certain seasons.

Fences act as physical *and* psychological markers of status, ownership and control and we may be watching new iterations of old forms of tenure. A 63-year-old headman commented on the areas that are being fenced under his watch.

These areas have old names. You could not go inside these areas during the forbidden times. Before there was no fencing but these grasslands

were protected. If someone's animals crossed our boundary and strayed into our [winter] pastures, we killed one of their sheep. Then we put the entrails on the boundary to warn them and to show everyone where our land lies.

Thus, it is important to deliberate whether fences are indeed producing a 'topomorphic revolution' – the fundamental transformation of resource use and landscape features (Williams 2002). In the TAR, the pastures where fencing is being installed are typically located in historically protected areas. It is not unusual that the nomads would want to continue to guard these areas, and that they are enthusiastic about using labour-saving herding technology to do so.

Whither the Mutton Eaters?

At this point, we come to a heuristic close. We leave hanging the question of future rangeland management amidst demographic, economic and social change, especially in the context of China's 'Great Leap Westward' and accelerated economic immigration by non-Tibetans with the completion (anticipated in 2005) of a railway connecting Tibet to Qinghai Province, and from there to the rest of mainland China. As we have seen from the recent past, the kinds of resource use we can anticipate in pastoral Tibet will be subject to a dynamic and complex interplay between political economy, social organisation and environmental constraints.

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Notes

1. Notwithstanding ongoing debates over the geographical/cultural/political definition of 'Tibet', this article uses the term interchangeably with the Tibet Autonomous Region (TAR). Unless specifically indicated, this research does not cover other provinces of the PRC, such as Qinghai, which have significant Tibetan-speaking pastoral populations.
2. There is a large literature that describes the reform era – its contents and discontents – in mainland China. One of the main concerns of this literature is to characterise the nature of the Chinese state. How would governance operate after Mao? How would the

CCP adapt and continue to govern? Prominent among these accounts of state–society relations are Shue (1984), Chan et al (1984, 1992), Dassu and Saich (1992), Croll (1994) and Blecher and Shue (1996). A related literature tackles the question of what the reforms have meant for minority nationalities in China (see Herberer 1989, Choeden 1992, Mackerass 1994 and 2003). Fewer authors have dealt with the effects of the reforms on land management, especially in pastoral areas (see Ho 2001, Sneath 2002, Williams 2002). Accounts of the reform era among pastoral Tibetans include Clarke (1987), Goldstein and Beall (1989, 1991, 1990, 2002), Levine (1999), Shakya (1999), Manderscheid (2001), among others. Development topics in Tibet are taken up by Karan (1976, 1981), Clarke (1986, 1987), Forbes and McGranahan (1992), and Yeh (2003b).

3. Tibet's rangelands cover 80 million ha, or 69 per cent of its total land area and one-fifth of the PRC's total grassland. China has 260 pastoral counties comprising 39 million people, mostly in minority nationality regions. It has 400 million ha of grasslands – the world's third largest – constituting 40 per cent of its landmass; these rangelands support the world's largest combined population of sheep and goats, and the fourth largest concentration of cattle (Banks 2003: 717).
4. The 'iron bowl' refers to the Communist Party's guarantee that everyone living under the socialist system would be fed, regardless of performance in work or contribution to production.
5. These are the terms assigned throughout the PRC to the administrative entities below the level of county, with the 'natural village' being the smallest unit within the government.
6. Other efforts to develop speciality Tibetan products from pastoral areas include the following: (1) the Trace Foundation of New York has invested heavily in a cheese factory run by monks in Qinghai Province; (2) several Chinese manufacturers are producing yak jerky and yak yoghurt for sale; (3) the Tibet Poverty Alleviation Fund has hired international consultants to help in the design of custom-woven wool products like scarves, sweaters, blankets, etc.
7. According to some official sources, up to 90 per cent of China's rangelands are degraded (Chinese government sources cited in Banks (2003: 718); estimates of 'moderate to serious' degradation range from 30 per cent to 40 per cent of these rangelands. The total area of degraded rangeland almost doubled between 1989 and 1997, with a notable acceleration in the mid- to late-1990s (Chinese government sources cited in Banks (2003: 718). Miller (2001: 5) uses government sources to estimate that 12 million ha of rangeland in the TAR are degraded (or about 15 per cent of Tibet's total grasslands) and gives the rather precise figure of 684,853 ha that are 'badly degraded'; this report specifies that Nag Chu Prefecture has the biggest problems, with 4.8 million ha or about 40 per cent of the total degraded rangeland in the TAR. Literature that has linked overstocking to a 'tragedy of the commons' scenario in Tibet includes Ellis (1992), Longworth and Williamson (1993), Tuoman (1993) and Wang (1995).
8. This article will not reprise the efforts of numerous other scholars to deconstruct the naturalised assumptions about scientific 'truth', and how scientific knowledge is culturally constructed and mobilised for political ends (Nader 1996, Adams 2001, Fairhead and Leach 2003). Williams (2002) argues that Chinese officials deflect responsibility for existing environmental degradation by diverting blame either in space or through time. The space-oriented strategy places blame on local land users far from Beijing who are routinely portrayed as ignorant, irrational, backward, and

- uncooperative, while the temporal strategy lays responsibility at the feet of previous governmental regimes.
9. Compare Williams (2002). Since the 1990s, there has been a proliferation of INGOs working in PRC. China's embrace of international aid began in 1978, when the government sought technical aid from the UNDP; within two years, China entered the IMF and World Bank, while UN development agencies were supporting some two hundred projects (Croll 1994). There has been a dramatic expansion of INGOs working in the TAR, too, though their field of operations are more strictly controlled by the government, which sets narrow limits on the geographic location of projects as well as hiring stipulations for Tibetan staff.
 10. It has been more than a decade since rangeland scientists, including Behnke et al. (1993), Ellis et al. (1993), Westoby et al. (1989) and Illius and O'Connor (1999), weighed in against the carrying capacity concept (wherein stocking rates are limited by planners' calculations of productivity and grazing pressure). They argued that Western range science was missing the temporal and spatial dynamism of pastoral movements and therefore overestimating the impacts of grazing pressure in the marginal rangeland environments where pastoralists typically live. These 'non-equilibrium' theorists argued that climate – as opposed to human-induced pressures like grazing – controlled bioproductivity. There is an ongoing debate regarding ecological dynamics in semi-arid rangelands and scientists now argue that both climate and human impacts may be driving productivity in such non-equilibrium systems.
 11. Humphrey (1995) mentions similar schemes in the former Soviet Union, where the state acted in a redistributive role that was 'geographically egalitarian' and richer, more productive regions of the USSR subsidised poor ones.
 12. Examples of these 'sister' partnerships follow, listing the Tibetan administrative unit first, and the mainland province second: Kongpo – Fuxien, Lhoka – Hubei, Lhasa – Jinju & Beijing, Medrogonkhar – Nangjing, Ngari – Shanxi, Naqu – Liaoning, Chamdo – Sichuan & Trungxing, Shigatse – Shangdong.

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