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Grassland Enclosures: Catalyst of Land Degradation in Inner Mongolia

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Since decollectivization, Chinese government policies have promoted household enclosures as the best solution to maximize pastoral productivity and control desert expansion in grassland areas. Recent fieldwork from Inner Mongolia contradicts this optimism. Data and participant-observation reveal that enclosures, as implemented through village level social context, actually compound grazing problems for most residents and the wider ecosystem. Expanding household enclosures function to intensify hyper-critical stocking ratios on highly vulnerable rangeland, exacerbating wind and soil erosion processes across vast territories only to protect small isolated fields dedicated to poorly financed fodder cultivation. This case study indicates that privatization of land in modernizing pastoral societies can be less meaningful for good resource management than other factors, such as secure tenure, equitable access to community resources, and meaningful institutional supports in the form of credit, production services, and legal protection.

Key words: environmental degradation, pastoralism, common property resources, land tenure; China

Many influential people still insist that common property resources need only be parcelized and privatized to promote conservation in an increasingly crowded world. For pastoral societies, this facile doctrine has frequently instigated government policies that dramatically narrow access to forage and water across national rangelands. Typically, large tracts of land that once accommodated multiple uses and users become partitioned and distributed among single or small cluster households, always with highly significant consequences for land use and local social relations. New restrictions of access to land resources are widely conceded to introduce troubling social inequities, but policy makers usually justify this result as the necessary cost of good stewardship. The disposal of common herders and common lands, however, does not always enhance prospects for sustainable land use. As recent government initiatives come of age, evidence mounts that privatization is no tidy solution to land management problems.

Anthropologists have labored at length to demonstrate the many oversimplifications inherent in the popular interpretive framework described above that Hardin (1968) once (mis)coined the "tragedy of the commons." (For a comprehensive critique, see McKay and Acheson 1987; for a more narrow focus, see Feeny *et al.* 1990; Dove and Rao 1992). During the last decade, numerous studies have stressed the general inapplicability of the model to traditional societies, demonstrating from ethnographic research that indigenous forms of land utilization do not inevitably lead to range degradation (see Goldstein *et al.* 1990; McCabe 1990; Buzdar 1992). Other field studies argue conversely that privatization does not exactly guarantee conservative rangeland management (Little and Brokensha 1987).

This article documents yet another case study — an ongoing enclosure policy in the Inner Mongolia Autonomous Region (IMAR) of Northern China — and offers detailed field data as evidence to support a growing literature that privatization can easily complicate problems of grazing management among modernizing pastoral societies. In this example, privatization is a losing proposition for both the majority of residents and the wider ecosystem over a time frame of sufficient duration to merit serious concern. Furthermore, the article brings evidence to bear from a relatively uninvestigated corner of the world that land use is a socially embedded phenomenon of widely underestimated complexity. Whether a management regime be private or collective, human-land proprietary relations are not necessarily as straightforward as once imagined. Data from Chinese grasslands indicate that privatization avails no simple solution to sustainable land use, and requires definite institutional supports (not merely coercion) to prevent broad systemic distortions.

A village-level case study of land use from pastoral China is long overdue, and deserves attention for three important reasons. First, China has a huge pastoral industry of geopolitical significance, though scholars do not often realize it. Dwarfed by the numbers and political centrality of ethnic Han cultivators, minority pastoralists in China remain obscure, marginalized on

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the fringes of Chinese geography, scholarship, and national economic priorities. Yet China has 260 pastoral counties accounting for 39 million people. It has some 400 million hectares of grassland comprising 42% of its land mass. Northern China contains the world's third largest grassland, which supports the world's largest population of sheep and goats and the fourth largest concentration of cattle (Zhang Xinshi 1992:47). Inner Mongolia itself constitutes fully one fourth of China's total rangeland area, and over recent years has produced more wool, cashmere and camel hair than any other province (Zhang Cungen 1990:57).

Second, little published ethnographic data are available about contemporary life and land use in the grasslands. The limited information available in English can be explained by problems of long-term access to sensitive border regions that have only recently relaxed (see Sneath 1991; Pasternak and Salaff 1993; Longworth and Williamson 1993). The need for information from this area only grows stronger with China's own reassessment of its importance for continued national development. Within a domestic agenda, China hopes to increase the dietary intake of protein among its citizens by eating more red meat. It also hopes to secure more fully the strategic border regions that are populated by minority ethnicities by raising the low standards of living. Within an international agenda, China hopes to expand exports not only in meat and leather products but also in light industry, which relies heavily on raw materials provided by sheep and goat husbandry.

Third, a critical situation prevails across most of China's northern grasslands. Severe and widespread land degradation has seriously limited prospects for sustained agro-pastoral production. Official reports from China routinely assert some figures that have become familiar in mainstream media: formerly fertile grassland has been lost to moving sand at a rate of 2,100 square kilometers per year over the last decade, critically affecting eight percent of total land mass and compromising the livelihood of about 170 million people (China State Council 1994:180-181). This article testifies to the direct relevance of anthropogenic factors on wind and soil erosion processes that contribute to desert expansion.

Case Study

Not unlike the critical juncture of the Dust Bowl era in American history, accelerating land degradation in the Inner Mongolia Autonomous Region especially challenges Chinese policy makers to reconsider development strategies for endangered rangelands. The sandy lands of Inner Mongolia are widely considered to be man-made disasters, prime examples of an environment "sabotaged" for centuries by excessive grazing, inappropriate cultivation, and deforestation (see Xu 1993; Zhu 1990:70; Hu 1990:204-207). In recent years, central and provincial level governments have formulated explicit grassland policies to address human dimensions of resource management. Ironically, interventions imposed from outside have in many respects only made matters worse for much of the indigenous population. Whatever combination of physical, biological, and social forces may have originally turned grass into sand, over the last fifteen years it has been the policy-initiated grazing management system itself that has magnified wind and soil erosion processes.

The favored policy since decollectivization has been an enclosure movement that, once implemented at the village level and mediated by local social realities, actually accelerates the very chain of ecosystem decline which the policy intended to bring under control. That assertion may well sound counter-intuitive to anyone who has toured the grasslands, where even casual observation confirms a consistent structure to the degraded landscape: enclosed territories appear green from light grass cover while land outside the fences appear patchy at best, marked by semi-fixed dunes. Given the stark contrast, it is easy to misperceive the reality of the situation and imagine enclosures to be a promising solution to the problems of household resource management. Perhaps it is just such superficial grassland tourism that accounts for the longevity of this erroneous but popular view among so many China policy makers. Despite appearances, fences are not saving the grasslands. If one stays long enough to observe local behaviors, a much different perspective emerges.

My research indicates that as privately enclosed land area has steadily increased since 1980, local elites have advantageously manipulated stocking ratios in such a way as to intensify grazing pressures on precisely those tracts of land most immediately vulnerable to erosion processes, and at the worst possible period in the vegetation growth cycle. In essence, the greenery of private enclosures is purchased at the expense of the larger regional ecosystem. A presentation and discussion of data to support this finding will follow a brief review of the post-reform policy initiatives intended to facilitate discussion.

Policy Initiatives

Grassland degradation processes in large areas of Inner Mongolia were already advanced at the time when decollectivization began in the late 1970s. Chinese leaders and specialists, apparently hoping to protect against further ravages expected to follow from minority pastoralists herding private livestock on public range, instituted the new "double contract" household production responsibility system of management whereby local production brigades distributed land use rights (in 1984),[1] as well as animals (in 1981), among independent herding families. Privatization of rangeland resources was intended to be an initial step in a long series of adjustments intended to "rationalize" the animal husbandry sector. Li Yutang, Director of the Grassland Division of the Ministry of Agriculture in Beijing, has outlined the basic reform strategy: first, distribute animals to private households; second, distribute grazing lands; third, assign carrying capacities for each plot of land; and finally, implement incentives and sanctions to enforce a sustainable balance between animals and vegetation at the household level (NRC 1992:33; Li 1992). Prominent scientific publications have likewise endorsed a similar formula to attain the desired "rational management system" (see NRC 1992:49; Huang 1989; Jiang 1989; Zhang 1989).

Chinese policy makers have assumed that private enclosures would force independent households to confront the contradictions between forage demand and forage availability among their separate herds. The logic of that policy requires animals to be contained within a bounded territory. Furthermore, household managers were expected to gradually substitute labor and capital for increasingly scarce fertile land, and thus a

traditional, "rely upon heaven," extensive grazing regime would eventually yield to a conservationist, "scientific," intensive regime made possible through technical inputs and motivation born of private ownership. Despite the visionary objectives, neither assumption has proven valid. One simple reason is because the vast majority of households have been left to their own devices to cover the high costs of capital investment. However, more complicated social factors are also involved, with the result that most animals still do not graze within private enclosures, and more sustainable land use practices have not evolved.

To investigate and better understand the situation from a household perspective, I conducted fieldwork over a period of twelve months during 1993-94 in the remote Nasihan Township of Wengniute Banner, Chifeng City Prefecture. This area is located about 500 kilometers northeast of Beijing in the triangle of land between the Xilamulun and Laoha rivers. I engaged in participant-observation and collected data throughout the entire township, but the bulk of my contact occurred with residents in my host village of Wulanaodu, where I enjoyed relatively unimpeded access to government documents, household registries, and personal interviews. Wulanaodu is a community where the proliferation of household enclosures is relatively advanced. It is likely that their experiences thus anticipate somewhat the transformations that are just now beginning, or yet to occur, in other pastoral areas of Inner Mongolia.

In 1993, Wulanaodu had a population of 740 people divided among 174 households. The population is 98% Mongol ethnicity, and stock herding of cows, sheep, and goats still accounts for 87% of community income. Wulanaodu is situated in the western portion of the Keerqin Sandy Lands, with only 51% of total land area officially classified as "usable pasture". Local vegetation is characterized as transitional (from forest to steppe system) and includes woody plants such as *Alnus pumula* and willows, *Betula microphylla* in dune areas, and *Ephedra distachya* and *Caragana microphylla* as predominant shrub species. The predominant grass species is *Pennisetum flaccidum*. This remote window onto pastoral China revealed some interesting and previously unreported facts about contemporary resource management in the northern grasslands.

Policy Impact

Distribution of privately managed real estate and the explicit promotion of enclosures resulted in the creation of distinctly different categories of land throughout pastoral IMAR. Within residential districts where herders have lived a relatively settled existence since at least the 1950s, there are four categories of land: 1) privately enclosed land, utilized either for supplemental hay production, gardening, or tree nurseries; 2) private unenclosed land and 3) public unenclosed land, both of which are made up of narrow sections of compacted turf functioning primarily as thoroughfares; and 4) enclosed collective property, held in reserve from June to mid October as fields for hay and fodder production to carry the community through lean months of winter and spring. User rights to the hayfield were originally distributed in 1982. Mowing strips were assigned to each family by lottery, with the size determined according to a formula based 40% upon family livestock and 60% upon male population.

Out on the range, removed quite a distance from residential districts, only two principal varieties of land exist: enclosed and unenclosed. Theoretically, each hectare of rangeland has been equitably distributed among all households in allotments roughly ranging from 47 to 67 hectares in size, depending upon quality of pasture conditions and remoteness from the village residential center. Private contracts issued at the time of decollectivization did not create clear property boundaries; they refer only to boundary outlines roughly demarcated by indistinct landmarks such as sand dunes, hills, or treestands. Over the years, barbed wire of various quality has come to define vast stretches of privately enclosed land, creating disconnected pockets that etch out territorial claims among semi-fixed dunes.

Within the rangeland enclosures, some areas may be more intensively nurtured for fodder production than others. Such areas are designated "improved pastures," in distinction to the term "semi-improved pasture," which applies to any fenced land. Territory that remains outside the fences constitute what is still the largest category of land in all of Inner Mongolia: unenclosed land that is utilized as public range.

The impact of enclosures on local land use and grazing management strategies has been dramatic. Contrary to the intended logic of privatization and parcelization, residents graze their animals as sparingly as possible on their own enclosed land. Since decollectivization, those households who could actually afford enough costly wire to protect their pasture allotments have faced no pressure whatsoever to alter their traditional grazing habits, and so quite rationally keep livestock outside enclosures so long as forage is available on the wide unenclosed range. This strategy permits them to maintain larger herds. They essentially pick clean the grass of those too poor to fence, saving their own for hay production or emergency grazing during winter and spring. Indeed, it is not uncommon for households with large enclosures to graze greedily all year long outside their own fences. Generally, cows and valuable transport animals (horses, donkeys, camels) are stall-fed throughout winter and spring, while sheep and goats are enclosed anywhere from one to the full six months of cold weather. But from the beginning of spring growth until late autumn, only select transport animals ever see the inside of a private enclosure.

Those residents who managed to acquire fencing early, either through direct purchase or as part of the decollectivization process, or by gaining access to limited bank loans through social connections, have enjoyed a tremendous advantage in local competition for present and future grassland resources. The most immediately productive tracts of land were coveted and enclosed first, regardless of proprietary contracts held by others. Furthermore, those with financial leverage have enclosed far more than their allotted share of rangeland, essentially squatting until the day that someone dares to push them back on rightful boundaries. To the majority of Wulanaodu households, the single most limiting factor of production has not been land, labor, or livestock, but barbed wire. Over time, more and more households have gained the means to claim some portion of rangeland, but they have in turn adopted the same exploitative grazing strategies.

Both the ambiguity of boundaries and the exercise of power through nepotism on the part of local officials have been instrumental in allowing this situation to arise. But more entrenched social factors are also at work. Limited access to rural credit is one problem. Since the enclosure policy was launched, only eight different families in Wulanaodu have

managed to secure loans significant enough (in excess of 2000 yuan, or about 250 USD) to finance production investments. These loans went to village elites — members of clout belonging to either the dominant kin network, the Communist Party, or both.

Furthermore, exploitative land use practices are actually encouraged, rather than curtailed, by grassland regulations. After the distribution of land use rights to households in 1984, policy statements circulating among township and village level officials stipulated that land must be well managed as a condition of tenure. Otherwise, pasture resources might be confiscated and entrusted to families more capable of using it productively. Good management is defined as a two-step process involving first "protection," which means surrounding property with fencewire, and second "construction," which means developing productive capacity by planting grass and trees (PGWC 1984). At village level implementation, this condition has been construed as license for illicit possession of property; that is, whoever has the leverage to enclose land, by definition becomes the rightful caretaker. Policy thereby becomes an unintended source of economic exploitation and chaotic grazing practices, despite official rhetoric to the contrary. This is the context in which influential scholars and policy makers in Beijing, apparently oblivious to local conditions, repeat their calls for "rational" land use that extol coercive measures (China State Council 1994:169). Under prevailing conditions, their sanctions would not penalize exploitative elites, but instead would punish a large number of poor households who are losers in the race to control community resources.

Beyond the problematic implications of such land use for social justice and community harmony, the enclosure movement has both perpetuated and aggravated pre-existing land tenure insecurities that have long exerted a detrimental influence over grassland management strategies. In some areas of Inner Mongolia, over the span of just one generation personal property rights have changed some nine times since 1949. Variations in the exercise of livestock ownership have especially fluctuated through several stages moving toward both collectivization and decollectivization. For a review of these various changes, see Longworth and Williamson (1993:42-47). Substantive changes in land tenure relations have also occurred at least four times, not including all the instances since decollectivization when the government announced alterations in the contractual duration of private land use rights. Property rights have changed far too often for these settled herders to see the sense of investing much energy or capital into pasture reconstruction. Residents of Wulanaodu simply laugh when asked how long they expect to enjoy utilization rights to the land over which they now tentatively assume control. When interviewed, at least 52% of Wulanaodu household managers openly doubt the long term stability of current tenure relationships. The free-for-all atmosphere created by unregulated enclosures has only fed this insecurity for all.

In addition to the problem of illicit enclosures on the range, land tenure insecurities are aggravated by changes in policy regarding access to the collective hayfields. For example, after 1982, mowing rights were redistributed in 1987 to accommodate the population growth and provide for newly created households. In 1993, however, in some villages of Nasihan Township, local authorities decided to raise revenues by charging residents substantial new fees for their mowing rights, which must be paid in advance. People are free to refuse the new tax, but they simultaneously forfeit their rights to harvest precious winter fodder. Further, these changes occur without warning or any guarantees about future rates.

Land Degradation

As enclosures expand, grazing pressure and erosion both intensify and the poorest residents bear the brunt of ecosystem decline. Seeking to prevent a "tragedy of the commons" scenario, enclosure policies in Nasihan since decollectivization have actually precipitated it. I have arranged the relevant summary data into three related tables.

Table 1 reports the increase of privately enclosed land in Wulanaodu since 1980. Table 2 reports yearly sheep equivalent units (SEU) for summer/fall months from 1984-1993 in the village. It also indicates yearly stocking ratios (SEU/hectare) on unenclosed and enclosed public range during the critical vegetation growth season from late spring to late autumn. Table 3 likewise reports yearly sheep equivalent units for winter/spring months from 1988-1994 (the only years Wulanaodu officials collected such data).[2] It also tracks stocking ratios on household enclosures. I collected enclosure data and herding strategy for each household through private interviews conducted in the home, while livestock data came from annual village registries. Combining these data sets, I then computed how many total cows, sheep, goats, horses, donkeys, and camels for the entire village grazed outside all private enclosures during each season of the year.

Figures for Tables 2 and 3 are based on a total land area defined as 100,000 mu, or 6,670 hectares (1 mu = 0.067 hectares). The most recent land survey estimates total land area of Wulanaodu to be 132,914 mu, but roughly 33,000 mu must be subtracted to account for moving dunes (22,000 mu), forested area not included among household enclosure data (10,200 mu), land reserved for cultivation of fodder crops (600 mu), and unenclosed pond area (200 mu). Following the Chinese convention as outlined by the Chifeng Grassland Regulatory Office (CGRO 1990:217), one SEU is defined in Tables 2 and 3 as any combination of animals with a total forage demand roughly equal to that of one adult ewe, or 2.4 kg of dry matter per day. Each cow counts as 5 SEUs based on an assumed forage demand substitution ratio of 5, or 12.0 kg of dry matter per day. Each goat counts as 0.9, each horse as 6, each donkey as 3, and each camel as 7 SEUs.

The data reveal several important points. First, stocking ratios on the unenclosed range have climbed well beyond recommended levels year after year. Officially sanctioned stocking ratios in this degraded area have an upper threshold of 2.15 SEU/hectare. County level officials estimate that the range in its current condition can produce on average only about 925.19 kg of forage per hectare (or 61.71 kg/mu) over the entire growing season. At such low output levels, the nutritional requirements of each adult cow is said to require 35 mu of rangeland, with each sheep and goat requiring 7 mu (NTOD 1988). A look at Table 2, however, reveals that in Wulanaodu, summer/fall stocking ratios on unenclosed land have not fallen below 3.0 since decollectivization, even climbing as high as 5.96 in 1989. This figure is more than 2.7 times the estimated critical stocking rate.

Table 1. Yearly and Cumulative Wulanaodu Land Enclosure Totals (Hectares)

Year	Total (ha)	Cumulative (ha)	Rangeland (%)
1980	471.57	471.57	.03
1981	113.72	585.29	.09
1982	667.93	1253.22	.19
1983	183.76	1436.98	.22
1984	270.67	1707.65	.26
1985	223.11	1930.76	.29
1986	407.87	2338.64	.35
1987	394.00	2732.63	.41
1988	368.52	3101.15	.46
1989	244.46	3345.61	.50
1990	318.03	3663.63	.55
1991	82.51	3746.14	.56
1992	50.89	3797.03	.57
1993	29.41	3826.45	.57

Table 2. Summer/Fall Sheep Units and Rangeland Stocking Ratios (SEU/ha)

Year	Sheep Units	Unenclosed Ratio	Enclosed Ratio
1984	16531.8	3.307	0.093
1985	15111.6	3.151	0.114
1986	16252.0	3.700	0.116
1987	15890.6	3.969	0.112
1988	19290.3	5.292	0.148
1989	20272.2	5.961	0.154
1990	14865.1	4.769	0.161
1991	14682.1	4.827	0.169
1992	17203.7	5.773	0.181
1993	16204.8	5.483	0.178

Table 3. Winter/Spring Sheep Units and Rangeland Stocking Ratios (SEU/ha)

		Enclosed		Unenclosed	
Year	Sheep Units	(winter)	(spring)	(winter)	(spring)
1988	17361.8	2.876	2.327	2.415	2.793
1989	15577.7	2.606	2.140	2.361	2.492
1990	11814.1	1.855	1.422	1.690	2.110
1991	13171.3	2.092	1.633	1.855	2.322
1992	14243.3	2.381	1.846	1.877	2.439
1993	13281.5	2.116	1.604	1.857	2.405

Second seasonal stocking ratios (and thus grazing pressure) can increase significantly over time without any remarkable change in livestock numbers. In recent years at least, relentless stocking pressure derives not so much from ever larger numbers of animals, but from the effects of a shrinking land base during summer/fall. As the total land area of private household enclosures increase yearly, grazing pressures from late spring to late autumn intensify on the unenclosed public range even though total SEUs in the village may remain steady, increase somewhat, or even decline. For example, since 1990, the stocking ratio on unenclosed land during summer/fall surpasses that of 1984 despite the fact that sheep equivalent units are generally down by an average five percent.

Third, late spring and early summer grazing seasons on unenclosed range can no longer be assumed to provide ample nutrition for livestock trying to recover from bitter winter months. With only 130-150 annual frost free days, the traditional animal husbandry production bottleneck of winter/spring feed has now, in a sense, been stretched into the summer months as well. Livestock in Wulanaodu are increasingly more likely to experience nutritional distress for longer periods. This phenomenon manifests itself in recent years through decisions to extend by up to ten days the usual June 1st cutoff for open grazing on collectively enclosed hayfields.

Fourth, the data testifies to what the majority of grassland residents already know to be true. That is, in Wulanaodu, any pre-reform imbalance between livestock forage demand and available forage has only been exacerbated in post-reform years by an unregulated enclosure policy that drops all animals on a shrinking land base for the entire growing season year after year. Fully 100% of interviewed household managers assert that the productive capacity of unenclosed rangeland has declined significantly since privatization. At least 39% of those same people dare to assert openly (in front of a foreigner!) that enclosures, as they function in their community, are not a good policy initiative from the collective point of view. This accords with the experiences of herders all across IMAR grasslands, as reported by Hinton (1990:107): "no matter where we went the people all said the grazing was worse than it had been ten years ago and much worse than in their childhood." If ground cover is crucial to impede effects of wind and soil erosion so integral to land degradation processes, then increased stocking ratios on large tracts of sparsely vegetated scrubland amounts to a grazing regime that deliberately puts the majority of land at risk in order to protect an occasional oasis of enclosed greenery.

Enclosures as implemented in Wulanaodu doubly jeopardize the wider ecosystem by training grazing pressure on the same vulnerable land throughout the entire growing season. Any potential relief that enclosures might provide the system through rotational grazing with public access land is largely diluted because of uncoordinated herding routines among households. Nor does rotational grazing occur within enclosed land on any large scale. When households manage to acquire fencewire, they typically seek to expand their net holdings, rather than parcel up what they have by sub-fencing.

There are serious ecological implications from this uncoordinated management system. Contrary to what seems to be a common perception among grassland officials, intensive grazing during the growing season is just as harmful to the range as overgrazing during early spring or late autumn. Soil studies conducted in the region stress the need to allow grass to regrow at least 15 cm between periodic grazing, as well as to prohibit grazing during the first 12-18 days of spring growth, and for 30 days at season's end to maximize vegetation performance and protection (Liu 1990). Soil carbon levels may decline by as much as 15% when 50% of plant production is removed during summer grazing, with losses estimated to be even higher on sandy Chifeng soils (Chuluun and Ojima 1993). Furthermore, above-ground biomass is believed to decrease "heavily" when grazing intensity during growing periods approaches 40% of plant growth, with additional detrimental consequences for soil salinity, pH, nutrient cycling, and organic matter (Kou *et al.* 1993).

Loss of soil cover from intensive grazing is particularly detrimental in eastern Wengniute County where yearly average

wind speeds are 4.0 m/sec and gale force winds greater than level seven occur at least 70 days per year (Xu Lan 1990:235). Sheet and gully erosion from water constitutes a significant hazard as well, despite average precipitation levels of only 368.8 mm for the past thirty years. Rainfall tends to be concentrated within two or three months, causing frequent summer floods.

The ratios listed in Tables 2 and 3 should not be construed as absolute values, given the unavoidable potential for informant error in the estimation of either livestock or enclosure data. Nevertheless, they do constitute the best available record, and accurately reflect upon a phenomenon that hundreds of household interviews across the township confirm to be true. The figures are certainly reliable enough to demonstrate the essential trend of a grazing management system that is contributing to ecosystem decline.

Policy Adjustment

It was in tacit recognition of some of these problems that a new direction in grassland management policy emerged in 1988. By then, some Chinese grassland specialists began to acknowledge that grassland reconstruction could not keep pace with rangeland degradation (Ba 1993:19). Subsequently, officials have enthusiastically promoted a different policy, known as the "small grassland enclosure" (*xiao cao ku lun*). The policy hopes to encourage independent households to devote their resources to more modest goals on a restricted scale, like intensive production of hay and fodder crops on enclosed plots of land no bigger than 20-30 mu. The small enclosure would serve as an artificial pasture, bringing together for maximum productivity five key elements: water, grass, grain feed, trees, equipment.

The plan first calls for sinking private wells and constructing a system of water conservancy. Next, leguminous grasses should be planted on 40% of the land area, with another 30% dedicated to silage grain (usually corn), and 20% reserved for other grain feed (usually soybeans). A shelter belt of poplar, willow, or elm trees should occupy the remaining ten percent of land area, both as a means to manage enclosure micro-climate and to diversify family economy with tree farming. Finally, electric water pumps operating 4-6 hours a day should complete the set, but additional recommended equipment includes: sprinklers, tractors, harrows, hay balers, and other processing tools.

The program is believed to be an efficient way to quickly raise technological levels and managerial skills where they are sorely lacking among "backward" communities (Ba 1993). Implementation of these goals, however, remains subject to the initiative and financial capabilities of each household. According to optimistic officials, after an initial downpayment of 2,500-3000 yuan (roughly 300-375 USD) toward the purchase of fencewire, seeds, tree saplings, and water pumps, 60% of the investment is recouped within the first year of production, and profits accrue by the second year.

Even if productivity could meet these high expectations, not many families can afford such expensive startup costs. The average net income for residents of Wulanaodu is only around 400 yuan per year (about 50 USD). And despite policy plans to make available benevolent loan options, credit remains hard to come by in rural China. As a result of poor financing, the artificial pastures rarely work according to plan, often missing two or three elements from the intended set of five. Even the crucial component of grass production seldom meets specifications, as households typically forego managed alfalfa cultivation and make do with what grows naturally. In Wulanaodu, the best managed artificial pasture yields about 370 kg. of haystraw per mu, an admirable harvest by local standards but far short of the projected 541.9 kg/mu for heavily fertilized fields (Hu 1990:216).

Epilogue

The Chinese have an expression that translates: "going out empty-handed to capture wolves." Rural people say this usually in the context of inadequate or improper preparation to tackle a difficult task. In Wulanaodu, some residents use it to mock grassland policies that call upon common herders to fix moving sand dunes and check advanced wind and soil erosion processes without the benefit of investment capital or even meaningful institutional support. For the majority of anxious herders who cannot exercise their land use rights, the smug enjoinder to flourish through the means of small enclosures amounts to a government invitation to lie vulnerable before the twin wolves of blowing sand and plundering neighbors.

Whatever the original intentions of the enclosure policy, the way it has been implemented at the village level does not promote sustainable pastoral production over short or medium-term considerations. The policy may yet produce a conservationist effect over much longer term considerations as the entire rangeland becomes parceled into separate enclosures and some guidance emerges to coordinate rotational grazing. As the situation now stands, however, chaotic grazing practices may substantially redefine the range and the community before any presumed long-term benefits have a chance to evolve.

NOTES

[1] Technically speaking, the 1984 distribution of rangeland resources allocated land use rights to "*lian hu*", or small household clusters (usually ranging from 3-5 households), who were supposed to manage and develop the land together. In reality, many of these small households functioned independently from the start. By 1988, discord was so prevalent that local authorities conceded to a second distribution which formally divided the range among independent households. My fieldwork investigations found that some land was claimed and enclosed for private use as early as 1980 in anticipation of rural decollectivization (see Table 1).

[2] The reason for the large difference between summer and winter livestock figures is that large numbers of animals are sold or slaughtered in the later months of the year, after they are fattened somewhat on autumn harvest but before the lean cold season begins.

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