Labour Organization and Hay–Feed Relations in Intensive, Semi-Intensive, and Pastoral Livestock Systems

Byambabaatar Ichinkhorloo, National University of Mongolia
Narenqimuge, National University of Mongolia
Xiangyun, National University of Mongolia

Abstract

This article compares pastoral and intensified livestock systems in Mongolia and Inner Mongolia, China, by examining how labour organization, feed dependence, and market relations reconfigure livelihood vulnerability and autonomy. Drawing on ethnographic fieldwork conducted between 2023 and 2025, including household interviews and participant observation, the study analyzes three contrasting production systems: intensive pen-feeding cattle farms in Tongliao, semi-intensive fenced-pasture households in eastern Inner Mongolia, and mobile pastoral herding in western Mongolia. The analysis shows that pastoral and intensified livestock systems are structured by fundamentally different forms of dependence. Pastoral livestock production remains directly exposed to climatic variability and pasture conditions; livestock survival depends on herders' continuous labour, seasonal mobility, and ecological knowledge. Yet despite its sensitivity to nature, pastoralism retains a relatively high degree of socio-economic autonomy, as households rely primarily on pasture and labour rather than on external inputs. Intensified livestock production, by contrast, reduces direct exposure to pasture variability through enclosure and feed-based systems, but becomes deeply dependent on state policy, feed prices, and integrated supply chains. As livestock numbers decline and production concentrates within feed- and capital-intensive clusters, herders are increasingly embedded in networks of suppliers, subsidies, regulation, and markets. By comparing Inner Mongolia and Mongolia, the article argues that livestock intensification does not eliminate risk but relocates it—from nature to institutions, from labour to markets, and from household autonomy to policy and price volatility. The findings challenge linear narratives of livestock "modernization" and demonstrate that pastoralism and intensification represent distinct socio-ecological regimes rather than stages along a single developmental path.

Keyword: intensive farm, ped-feeding, pastoralism, risk, agricultural incentive

Introduction

Livestock production in Mongolia and Inner Mongolia is often discussed through a shared language of crisis: pasture degradation, climate volatility, and pressure on rural livelihoods. These challenges are frequently framed as evidence of a necessary transition from extensive pastoralism toward intensified livestock systems. Yet such narratives obscure a more fundamental distinction between production regimes—namely, the different ways in which pastoral and intensified livestock systems organize dependence, risk, and autonomy.

Historically, both Mongolia and Inner Mongolia were characterized by mobile pastoralism grounded in seasonal movement, flexible land use, and labour-intensive herding. Over the past several decades, however, livestock systems in the two regions have diverged sharply. In Mongolia, livestock production remains predominantly pasture-based. Grazing continues to supply most animal nutrition, while hay and supplementary feed function as buffers during

winter and spring rather than as structural foundations of production. Despite rising livestock numbers and recurrent winter losses, intensification has remained partial and uneven, layered onto pastoral systems without replacing mobility or continuous herding labour.

In Inner Mongolia and northern China, livestock development has followed a different trajectory. Enclosure, pasture contracting, feed cultivation, and pen-feeding have been promoted as systematic responses to pasture degradation and rising demand for animal products. Through policies such as the Grassland Ecological Protection Subsidy and Reward Policy, pastoral land has been reorganized into bounded, regulated units, and livestock production has been integrated into spatially differentiated value chains linking breeding areas, feed-producing regions, and distant markets. These interventions have reduced direct reliance on open pasture while increasing dependence on purchased feed, infrastructure, and administrative compliance.

This article argues that the key distinction between these systems lies not simply in their degree of "intensification," but in the form of dependence they produce. Pastoral livestock production is more directly dependent on nature: climatic variability, pasture conditions, and seasonal uncertainty shape everyday work and livestock survival. Yet it remains relatively autonomous in socio-economic terms. Herding households rely primarily on their own labour, mobility, and pasture access, and can reproduce livelihoods without continuous engagement with markets, suppliers, or state programs. Intensified livestock production, by contrast, appears less exposed to nature but becomes structurally dependent on state policy, feed prices, and clustered supply chains. As livestock numbers decline and production concentrates, households become embedded in dense networks of input suppliers, subsidies, veterinary systems, and market regulation.

By focusing on labour organization, feed relations, and price structures, this article examines how these contrasting forms of dependence are lived at the household level. Drawing on ethnographic vignettes from Tongliao, eastern Inner Mongolia, and Zavkhan Province in Mongolia, the analysis compares intensive pen-feeding farms, semi-intensive fenced-pasture households, and mobile pastoral families. Rather than treating Inner Mongolia as a model toward which Mongolia is converging, the article approaches the two regions as operating within distinct socio-ecological regimes. This perspective allows for a more precise understanding of how risk is redistributed—from pasture to policy, from labour to markets, and from households to institutions—under different livestock systems.

This study employs a comparative ethnographic approach based on multi-sited fieldwork conducted between 2023 and 2025 in Inner Mongolia, China, and western Mongolia. Data were collected through participant observation, semi-structured interviews, and household-level documentation of labour routines, feed use, expenditures, and income. Fieldwork focused on three production settings: intensive pen-feeding cattle farms in Tongliao, semi-intensive fenced-pasture households in eastern Inner Mongolia, and mobile pastoral households in Zavkhan Province, Mongolia. Households were treated as the primary analytical unit, allowing the study to examine how labour, feed, and risk are organized in everyday practice rather than as abstract system categories. Interviews with herders, spouses, livestock traders, and local veterinarians were open-ended and iterative, complemented by direct observation and cross-checking of quantitative data. Comparative analysis proceeds through relational contrast, emphasizing how pastoral livelihoods depend primarily on pasture, mobility, and labour, while intensified systems rely on policy, feed markets, and clustered supply chains, without treating these regimes as stages of linear development.

The article first reviews the literature on livestock transformation in Mongolia and Inner Mongolia, focusing on labour organization, feed relations, and policy-driven restructuring. It

then presents ethnographic case studies from semi-intensive and intensive livestock systems in Inner Mongolia and a mobile pastoral household in Mongolia, before concluding with a comparative analysis that highlights how risk and dependence are differently configured across pastoral and intensified production regimes.

Extensive and Intensive Herding

The literature on livestock production in Mongolia and Inner Mongolia reveals two distinct but historically entangled trajectories of transformation. Both regions share a pastoral legacy grounded in seasonal grazing and mobility, yet their contemporary livestock systems are shaped by divergent institutional responses to pasture pressure, market integration, and climatic risk.

In Mongolia, livestock development is consistently described as remaining fundamentally pasture-based. National-level reviews emphasize that grazing continues to provide the primary source of animal nutrition throughout the year, with hay and supplementary feed functioning mainly as seasonal buffers rather than as structural replacements for pasture (Nyamgarav Tseveg-Ochir et al., 2024). The persistence of extensive grazing is not portrayed as a static tradition but as a system under intensifying pressure. Livestock numbers have increased rapidly since the 1990s, exceeding estimated pasture carrying capacity by more than forty percent, while over seventy percent of pastureland shows signs of degradation (Nyamgarav Tseveg-Ochir et al., 2024). As a result, pastoral production is increasingly characterized by heightened vulnerability during winter and spring, when forage scarcity, snow cover, and animal condition converge to produce high mortality risk.

Despite these pressures, the literature does not describe Mongolia as undergoing a wholesale transition toward intensive livestock systems. Instead, scholars repeatedly emphasize partial and uneven incorporation of intensification measures. Feed crops, silage production, and fattening enterprises exist, but they remain spatially concentrated, institutionally mediated, and limited in scale (Yang et al., 2022; Gombosuren et al., 2024). Even where semi-intensive fattening is promoted as a solution to pasture pressure and low productivity, it is framed as a targeted intervention rather than a systemic transformation. Mongolia's livestock system thus appears as a hybrid regime in which extensive grazing remains dominant, while intensive practices are selectively layered onto specific stages of production.

In contrast, the literature on Inner Mongolia and northern China frames livestock development as a deliberate restructuring of production systems. Studies of the farming–pastoral ecotone describe a coordinated shift toward enclosure, forage cultivation, feed processing, and drylot or semi-drylot feeding as a response to grassland degradation and rising demand for animal protein (Gao et al., 2021). Rather than attempting to restore mobility, policy and research emphasize replacing grazing with feed-based systems that integrate crop and livestock production across space. In this framework, pastoral land, cropland, and processing infrastructure are reorganized into linked chains, enabling breeding in grassland areas, fattening in crop-producing zones, and marketing near consumption centers.

This divergence is particularly evident in eastern Inner Mongolia, including areas such as Chifeng and Tongliao, where the literature documents rapid livestock growth under severe pasture constraints. These regions are repeatedly identified as sites of high-intensity livestock development, where enclosure and feed dependence are not optional but structurally necessary responses to ecological overload. Livestock transformation in Inner Mongolia is therefore narrated less as a gradual adaptation and more as a policy-driven reconfiguration of land use, production space, and supply chains.

Labour intensity and the reorganization of livestock work

Across both regions, labour emerges as a central axis of livestock transformation, but it is conceptualized in markedly different ways. In Mongolia-focused scholarship, labour is analysed primarily as a social relation embedded in authority, inequality, and moral obligation. Ethnographic work shows that herding labour is not merely a technical input but a key medium through which power and dependence are produced. Murphy (2015) demonstrates how post-socialist marketization has reintroduced contract herding and hired labour as dominant forms of labour organization, particularly among large herd owners. These arrangements stabilize herd accumulation for wealthier households while locking poorer households into labour-intensive roles that rarely lead to independent accumulation.

This reorganization of labour is further shaped by risk and crisis. Studies of dzud and insurance highlight how labour is mobilized through kinship networks, neighbourhood cooperation, and reciprocal obligations during periods of extreme stress (Murphy & Ichinkhorloo, 2023). Mutual aid, shared herding, and negotiated access to pasture function as informal insurance systems grounded in everyday labour and care. Importantly, the literature suggests that market-based risk management instruments may undermine these labour relations by individualizing responsibility without reducing exposure to climatic risk. Labour, in this sense, is inseparable from moral economy and from competing visions of security. Recent qualitative studies add a demographic dimension to this analysis. Out-migration of younger generations, gender imbalance, and aging herder populations have reduced household labour capacity, intensifying the burden of seasonal work such as birthing, haymaking, and winter preparation (Bai & Batsaikhan, 2025). Labour scarcity thus constrains not only herd management but also the adoption of more labour-demanding practices such as feed cultivation and confined fattening.

In the Inner Mongolia and northern China literature, labour is discussed less through moral economy and more through management intensity and cost structures. Studies of beef cattle development distinguish between continuous and intensive fattening systems, explicitly noting that these systems require sustained attention to feeding, breeding, and animal management (Liu et al., 2023). Although framed as technical management, these descriptions implicitly describe a shift toward more time-disciplined, continuous labour regimes. Enclosure and feed-based systems reduce the need for mobile herding labour but increase demand for wage labour, machinery operation, and technical expertise.

The literature further suggests that labour reorganization is scale-dependent. Smaller operations experience sharper cost increases under intensified feeding regimes, which can limit their ability to sustain labour-intensive systems (Liu et al., 2023). As a result, labour commodification and mechanization tend to favour larger, better-capitalized operations, reinforcing differentiation among producers. In Inner Mongolia, labour transformation is thus closely tied to enclosure, feed dependence, and integration into vertically organized value chains.

Economic and social dimensions of feed: pasture, hay, corn, and purchased fodder

Feed occupies a central position in the comparative literature, not simply as an input to animal growth but as a socio-economic infrastructure linking land, labour, and markets. In Mongolia, the literature consistently emphasizes the seasonal and climatic variability of feed availability. Pasture conditions determine not only summer grazing but also the ability to produce hay and maintain animal condition into winter (Nyamgarav Tseveg-Ochir et al., 2024). Hay production has increased, yet remains highly sensitive to drought and extreme weather, while forage

crop cultivation occupies a small share of cultivated land and fluctuates sharply year to year. National reviews stress that feed supply is structurally insufficient. Even when considering all forage enterprises and imports, available feed could meet only about half of estimated demand if allocated solely to intensive systems (Nyamgarav Tseveg-Ochir et al., 2024). This shortage has clear social implications. Winter feed deficits translate into higher mortality risk, reinforce reliance on emergency measures, and constrain the expansion of fattening enterprises. Feed therefore functions as a bottleneck that reinforces dependence on extensive grazing rather than enabling a transition away from it.

In Inner Mongolia and northern China, feed is framed as both a market commodity and a policy object. Studies of the farming–pastoral ecotone emphasize a shift from concerns over grain security toward feed security, driven by rising consumption of animal products (Gao et al., 2021). Corn silage, alfalfa, and processed straw are promoted as strategic resources, supported by investments in processing technology, microbial inoculants, and feed formulation databases. Feeding techniques are presented as central to reducing grazing pressure and stabilizing production. At the household level, however, the literature reveals significant economic tension. Semi-intensified feeding systems have become standard in some Inner Mongolian pastoral areas, but purchased fodder constitutes the largest single expense. Studies document how extended droughts lengthen feeding periods from four months to six or even eight months, pushing fodder costs to consume more than half of household income and driving some households into debt (Land, 2024). High feed prices, in turn, incentivize intensified use of remaining pasture resources, creating feedback loops between feed markets and grazing pressure.

Corn, hay, and purchased feed thus operate as economic and social forces. They reshape household budgets, influence decisions about herd size and mobility, and reconfigure relations between herders, markets, and the state. In Mongolia, feed scarcity reinforces social cooperation and moral economies of care, while in Inner Mongolia feed markets intensify commodification and differentiation. Across both contexts, feed emerges not as a neutral technological fix but as a key site where ecological constraint, labour organization, and economic risk intersect.

Policies implemented in Inner Mongolia and local practices

In the grasslands of eastern Inner Mongolia, long imagined as a space of open mobility and nomadic freedom, pastoral life in Tongliao and Chifeng has been reorganized into a tightly structured system of fixed plots, regulated schedules, and fiscalized compliance (Williams, 2002). This transformation is not simply an ecological intervention or a market-driven adjustment, but a fundamental re-engineering of pastoral social life, achieved through the coordinated deployment of law, technical standards, and state finance (Bauer, 2015; Yeh, 2009). At its core lies China's Payment for Ecosystem Services (PES) framework, operationalized through the Grassland Ecological Compensation/Protection Policy (GECP), which provides the fiscal foundation for contemporary pasture governance.

Pasture contracts and incentives

Institutionally, pasture protection in Tongliao and Chifeng is anchored in the "Double Contract" Responsibility System, which dismantles communal pasture arrangements and reallocates grassland use rights to individual households through Grassland Contracting Management Right Certificates. While ownership remains vested in the state, households acquire conditional use rights bound by explicit legal duties to protect grassland resources,

prevent overgrazing, and avert degradation (Inner Mongolia Autonomous Region Grassland Management Regulations, 2021). Through this contractual mechanism, herders are transformed into individualized stewards of bounded plots, their ecological obligations rendered legible and enforceable (Scott, 1998).

This legal grid operates across a vast spatial and fiscal scale. During the 2021–2025 policy cycle, Inner Mongolia's GECP framework encompasses approximately 1 billion mu of contracted pastoral land, supported by annual fiscal transfers exceeding 4.5 billion RMB (Inner Mongolia Forestry and Grassland Bureau, 2021; IMAR Finance Department, 2022). This macro-scale system cascades downward to prefectural administrations. Chifeng City administers roughly 51.6 million mu, receiving about 1.2 billion RMB annually, while Tongliao City manages approximately 48.2 million mu, with annual transfers of around 1.05 billion RMB (Chifeng Agriculture and Animal Husbandry Bureau, 2024; Tongliao Forestry and Grassland Bureau, 2023).

Implementation responsibility is formally assigned to flag/county governments, while league/city governments such as Tongliao and Chifeng supervise, inspect, and coordinate implementation to ensure standardization (Department of Agriculture and Animal Husbandry of Inner Mongolia Autonomous Region [DAAH-IMAR], 2023). Policy execution is divided among functional departments: finance departments manage fund allocation and performance assessment; agriculture and animal husbandry departments oversee household registration, policy rollout, and training; and forestry and grassland departments supervise compliance with grass–livestock balance, grazing bans, and seasonal grazing-rest systems, including the operation of a regional digital supervision platform (DAAH-IMAR, 2023). At the frontline, sumu/township governments and street offices organize day-to-day enforcement through grid-based accountability systems extending to the gacha (village) level, enabling routine inspection, data reporting, and public disclosure of subsidy eligibility and violations.

Incentives: ecological payments and layered subsidy structures

Within this institutional framework, pasture protection is incentivized through a two-tiered subsidy structure. The first tier consists of universal, area-based cash transfers tied directly to ecological zoning. Under the third round of the national policy, the central fiscal baseline is set at 7.5 yuan per mu per year for grasslands designated under no-grazing (禁牧) subsidies, and 2.5 yuan per mu per year for grass–livestock balance (草畜平衡) rewards (Ministry of Agriculture and Rural Affairs [MARA], 2021). These baseline rates apply uniformly in Tongliao and Chifeng as part of the central transfer system.

Policy instrument	**Monetary amount** **1 mu= 0.066 ha** **15 mu=1 ha**	**Trigger/condition**	**Source**
No-grazing subsidy (central baseline)	7.5 yuan/mu/year	Designated no-grazing area, compliance	(moa.gov.cn)
Balance reward (central baseline)	2.5 yuan/mu/year	Balaity	(moa.gov.cn)
No-grazing subsidy (banner example)	9 yuan/mu/year	Banner implementation standard	(sntzq.gov.cn)
Balance reward (banner example)	3 yuan/mu/year	Banner implementation standard	(sntzq.gov.cn)

Minimum guarantee (banner example)	≥ 5,000 yuan/person/ year	Cap/bottom mechanism in no-grazing zone	(sntzq.gov.cn)
Fine for overstocking (if not corrected)	100 yuan per overloaded sheep unit	Over approved carrying capacity, fail to correct	(zlq.gov.cn)
Fine for illegal grazing (ban/rest)	120 yuan per illegal grazing sheep unit	Grazing in no-grazing zone or rest period	(zlq.gov.cn)
Example applied fine	1,800 yuan	15 sheep units × 120 yuan	(zlq.gov.cn)
Carrying capacity example standard	10.14 mu / sheep unit	Local approved theoretical standard	(xwq.gov.cn)
Spring rest minimum	≥ 45 days; start ≥ Apr 10	Spring green-up rest	(sntzq.gov.cn)

Table 1. Policy instrument on pastoral herding

Local governments, however, are authorized to recalibrate these payments using autonomous-region and local fiscal resources. In practice, banner-level implementation plans raise effective rates and introduce equity mechanisms such as minimum guarantees (保底) and payment caps (封顶) to address disparities in pasture endowments and household size. A banner-level example illustrates this logic: subsidy standards are set at 9 yuan per mu for no-grazing areas and 3 yuan per mu for grass–livestock balance areas, while guaranteeing no less than 5,000 yuan per person per year in no-grazing zones and capping payments at levels linked to local per-capita disposable income (Sunite Left Banner People's Government, 2023). Comparable mechanisms are applied across banners in Tongliao and Chifeng, even though precise per-mu rates and caps vary locally.

For grasslands deemed ecologically fragile, Grazing Ban Zones impose absolute restrictions. Here, grazing rights are fully suspended and replaced by the Grassland Ecological Protection Subsidy, explicitly granted "for grasslands under grazing ban" (Tongliao Municipal People's Government, 2022). Standardized rates for this tier are set at 9.375 yuan per mu for grazing bans and 3.125 yuan per mu for grass–livestock balance zones (Inner Mongolia Forestry and Grassland Bureau, 2023). These funds flow downward with remarkable precision. In Hure Banner (Tongliao), for instance, approximately 31.8 million RMB was disbursed in 2023 across 7.89 million mu, with township-level allocations—such as 1.86 million RMB in Manghan Sumu—calculated directly from contracted pasture areas (Hure Banner People's Government, 2023).

Alongside GECP payments, households—particularly in Chifeng—may also receive the Cultivated Land Productivity Protection Subsidy, a separate universal cash transfer targeting grain security on farmland, with rates such as 85 yuan per mu in 2024 (Chifeng Finance Bureau, 2024). Together, these parallel subsidies embed pastoral households in a compartmentalized land-use regime that simultaneously governs ecological protection and agricultural production.

Regulations and sanctions in Inner Mongolia

Enforcement of pasture protection hinges on the conversion of ecological conditions into numerical limits and temporal rules. Most households in Tongliao and Chifeng are located in Grass–Livestock Balance Zones, where they must sign annual responsibility pledges that translate pasture ecology into a binding carrying capacity expressed in "sheep units."

Technical guidelines specify conversion rules—such as one head of cattle equaling five sheep units—making mixed herds commensurable and enforceable (Horqin Left Rear Banner Agriculture and Animal Husbandry Bureau, 2023). Exceeding the approved quota constitutes a contractual breach and triggers sanctions.

Time, as well as space, is regulated. Across Inner Mongolia, including Tongliao and Chifeng, the grass–livestock balance system mandates a spring green-up grazing rest period (返青期休牧). Policy interpretations specify that this rest period must last no fewer than 45 days, with start dates not earlier than April 10, though exact calendars are announced annually by banner governments in response to local climatic conditions (Sunite Left Banner People's Government, 2023). In Naiman Banner, for example, regulations require that from April 10 to May 25 all livestock be pen-fed during the spring rest period (Naiman Banner Government, 2023).

Violations are penalized through a combination of monetary fines and subsidy-based sanctions. For overstocking beyond approved carrying capacity, households are ordered to correct violations; failure to comply may result in a fine of 100 yuan per overloaded sheep unit. Grazing in no-grazing zones or during mandated grazing-rest periods incurs a higher penalty of 120 yuan per illegally grazed sheep unit (Zhenglan Banner People's Government, 2026). Administrative case disclosures demonstrate that these penalties are actively enforced; in one documented case, illegal grazing involving 15 sheep units resulted in a fine of 1,800 yuan, calculated directly on the per-unit basis (Zhenglan Banner People's Government, 2026). Beyond fines, local governments are authorized to withhold, suspend, or cancel grassland ecological subsidy eligibility, making fiscal exclusion a central and often more consequential enforcement mechanism than monetary penalties alone (DAAH-IMAR, 2023).

Taken together, the pasture-protection regime operating in Tongliao and Chifeng reveals how ecological governance functions as an integrated project of statecraft. The Double Contract System creates the cellular legal grid; zoning, carrying-capacity quotas, and grazing calendars translate ecological goals into enforceable obligations; and a layered subsidy regime provides the fiscal underpinning for compliance. Through this configuration, subsidies increasingly function as a state-paid quasi-wage, rendering household livelihoods contingent on the correct performance of state-mandated techniques such as semi-pen feeding (Kolas, 2014).

The result is a pastoral system that is settled, monetized, and legible. While it has contributed to curbing degradation and delivering predictable incomes at scale (Bryan et al., 2018), it has also entailed profound socio-ecological simplification: the fragmentation of the commons and the devaluation of mobile pastoral knowledge (Li & Huntsinger, 2011). In this system, the herder is no longer a navigator of open rangelands but a meticulous accountant of a bounded plot, living through the precise enactment of policy within a state-engineered pastoral grid.

Fenced pasture and pen-feeding under semi-intensive livestock production

A fenced-pasture and pen-feeding system can be illustrated through the household of Amarsain and Bayantsetseg, a couple in their early sixties living in Bayanzürkh gacha in Inner Mongolia. Like many households in the area, their children have migrated to the city: the couple has three adult children, all of whom now live and work in urban centers. The household currently keeps just over 200 sheep, along with six cattle and eight horses. They hold contracted use rights to 900 mu of winter pasture and 300 mu of summer pasture, and cultivate corn on more than 90 mu of land. Within the local context of fenced-pasture households, Amarsain's family is considered relatively well-off. They have enclosed more than 50 hectares of pasture

and prepare substantial quantities of supplementary feed for winter and spring, including approximately 18 tons of hay, 9 tons of corn, and 1.4 tons of corn powder.

Livelihoods based on fenced pasture and cultivated feed, however, are intensely labour-demanding. In earlier years, the household relied on the labour of their children during peak seasons, but as the children left for urban employment this support disappeared. Today, Amarsain and Bayantsetseg depend almost entirely on their own year-round labour, supplemented occasionally by hired help. This shift has led to a noticeable decline in net income, despite the household's relatively large asset base. Corn planting and irrigation, haymaking, and the preparation of soaked corn powder for daily feeding during winter and spring—over a period exceeding 150 days—require sustained physical effort. Daily routines include hauling feed, distributing hay and corn, watering animals, and cleaning pens. As labour capacity has diminished with age, the household has been forced to reduce livestock numbers and abandon seasonal movement to summer pasture. The herd has been stabilized at around 200 head, and livestock are now kept year-round within the fenced winter pasture.

This household's current production system is the outcome of decades of accumulated labour investment. In their younger years, Amarsain and Bayantsetseg devoted substantial effort to transforming their land: they constructed irrigation channels and embankments, planted shelter trees, erected fences, built housing and animal shelters, and gradually enclosed their pasture. Although now elderly, they continue to carry out daily herding and feeding tasks. The family is indigenous to the gacha and signed a pasture enclosure contract in 1997, after which they settled permanently on their winter pasture site. The shift to permanent residence on enclosed land marked a decisive break from earlier mobile practices.

The local pasture regime is organized around a division between winter and summer pastures. Winter pastures are individually contracted, fenced, and managed by households, while summer pastures lie in distant mountain valleys and are allocated collectively to gacha households without fencing. Amarsain's household has fenced 900 mu of winter pasture and holds 300 mu of unfenced summer pasture located approximately 15 kilometers uphill, in a mountain valley. Within the fenced winter pasture, land is internally subdivided according to function: approximately 700 mu are used for grazing, 150 mu are reserved as hayland, 65 mu are planted with corn, and around 3 mu are occupied by housing, animal shelters, and infrastructure. One mu is approximately 666 square meters, and 15 mu equal one hectare.

In addition to pasture, the household participates in collectively held cultivated land on the western side of the gacha. Land-use rights are distributed among households, while agricultural companies or hired workers are contracted for planting and harvesting. When vegetable plots were allocated, Amarsain's household received 15 mu. Land distribution was calculated at 4.6 mu per household member. The family later purchased an additional 8 mu from other households, bringing their total to 23 mu, which they now lease out rather than farm themselves—an adjustment reflecting labour constraints rather than land scarcity.

Livestock management follows a semi-settled, semi-pastoral rhythm structured around enclosure and supplementary feeding. Under a 30-year pasture contract signed in 1997, sheep are kept on the fenced winter pasture from late November through May. During this period, daily feed rations consist of approximately 300 grams of crushed corn per sheep, 500 grams of corn per horse, and 1.5 kilograms of corn powder per head of cattle, combined with limited winter grazing. Feeding is carefully timed. Sheep receive corn early in the morning and are released into the fenced pasture around 8:30 a.m., a practice intended to encourage longer grazing. In winter, they return to the enclosure around 4–5 p.m., are watered, and receive a small quantity of hay. On cold nights, sheep remain in sheltered pens; on milder nights, they stay in open enclosures.

Pregnant ewes are managed separately. They are fed 300 grams of corn in the morning, hay at around 4:00 p.m., and an additional 200 grams of corn in the evening. Lambing typically takes place in March, a period that intensifies labour demands and requires close monitoring. From May to November, cattle and horses are sent to other households for herding on open pasture. The herding fee is 800 yuan per head, rising to 1,300 yuan for cows with calves or mares with foals. In winter, cattle are brought back to the fenced pasture and fed 1.5 kilograms of corn powder per day, soaked in warm water.

Veterinary care is provided by the gacha veterinarian and includes treatments for mange, ticks, anthrax-like diseases, deworming, and injections. Annual veterinary expenditure amounts to approximately 2,000 yuan, while vaccinations for brucellosis and foot-and-mouth disease are provided free of charge. The household also uses 17 bags of salt and mineral lick per year, each weighing 25 kilograms and costing 25 yuan, for a total of 425 yuan.

With a herd of approximately 200 animals, the 900 mu winter pasture is sufficient to support grazing and supplementary feeding from December through April. In years with favorable rainfall and good pasture growth, the land can support up to 250 animals. When livestock numbers approach or exceed 300 head, however, pasture becomes insufficient and seasonal movement to summer pasture becomes necessary—a strategy that the household can no longer pursue due to labour constraints.

Through year-round labour and careful herd management, Amarsain and Bayantsetseg earn approximately 34,000 yuan annually (around 5,000 USD). This income covers daily household expenses, food and clothing, and occasional financial support for their children. In recognition of pasture enclosure and maintaining livestock numbers in balance with pasture capacity, local authorities provide an annual incentive of 5,000 yuan. Because livestock numbers cannot be expanded under the current labour and land constraints, it is not feasible for all children to sustain livelihoods as herders. As a result, the household's children have migrated to nearby cities for wage employment. This pattern reflects a broader trend in Inner Mongolia toward combined livelihood strategies, in which semi-intensive livestock production on fenced land is sustained alongside urban wage labour rather than replacing it.

EXPENDITURES	Unit cost	Total
Cost of mowing hay on 200 mu of land	12 yuan	2,200 yuan
Cost of baling and transporting hay: 1,300x2,5 for baling, 500x2,5 for transport, each 18 kg	2.5 yuan 2.5 yuan	4,500 yuan
Cost of planting and harvesting corn 9,000 kg	1.8 yuan	16,200 yuan
Shearing sheep and lambs	10 yuan	1,700 yuan
Veterinary services	—	2,000 yuan
Salt and mineral lick 17 bag, each 25 kg	25 yuan	425 yuan
Ram herding/service fee, rental	—	1,300 yuan
Absentee herding of 6 cattle, 8 horses	800 yuan	11,200 yuan
Artificial insemination of cattle	—	300 yuan
Fuel	—	1,000 yuan
Total expenditure		40,825 yuan

Table 2. Expenditure for herding

INCOME	Unit price	Total
300 bales of hay (16 kg each)	15 yuan	4,500 yuan
78 lambs (fattened)	650 yuan	50,700 yuan
5 old ewes	850 yuan	4,250 yuan
1 calf	7,600 yuan	7,600 yuan
Sheep wool	—	700 yuan
Sold hay	500 × 15 yuan	7,500 yuan
Total income		75,250 yuan

Table 3. Income from herding and hay making

Net balance (Income – Expenditure): **34,425 yuan annually**
(≈ 17.2 million MNT or USD 5,000)

The household's income–expenditure structure highlights both the productivity and the tight margins of fenced-pasture livestock production. Total annual expenditure amounts to 40,825 yuan, with feed-related costs dominating the budget. Corn planting and harvesting alone account for 16,200 yuan, while hay mowing, baling, and transport together add another 6,700 yuan, underscoring the centrality of cultivated and stored feed in sustaining livestock through winter and spring. Labour-related expenses—such as absentee herding of cattle and horses (11,200 yuan), ram herding fees, and shearing—further raise costs, reflecting both labour scarcity within the household and the monetization of tasks previously carried out through family labour. Veterinary services, mineral supplements, artificial insemination, and fuel represent comparatively smaller but necessary recurrent expenditures tied to herd health and reproduction.

On the income side, total annual revenue reaches 75,250 yuan, driven overwhelmingly by the sale of fattened lambs, which alone generate over two-thirds of total income (50,700 yuan). Additional income derives from selective livestock sales (old ewes and a calf), hay sales, and wool, indicating a diversified but livestock-centered revenue structure. The resulting net balance of 34,425 yuan (approximately 17.2 million MNT or 5,000 USD) suggests that the system is economically viable but highly sensitive to feed costs, labour availability, and market prices for lamb. Profitability is achieved not through herd expansion—which is constrained by pasture capacity and policy—but through intensive feeding, careful cost management, and strategic livestock sales. This income–expenditure profile illustrates how fenced-pasture households convert land, feed, and labour into cash income while operating within narrow margins that limit accumulation and intergenerational reproduction of pastoral livelihoods.

Cattle Farm and Settled Pen-Feeding System

We visited and interviewed the household of Mr. Su Yalatu (43) and Mrs. Hai Ri Han (44) in Nuguasaitai Village, Tongliao. The couple has twin sons. The visit took place on 30 July 2025, when we travelled from Tongliao city to a nearby gacha to observe livestock production under settled pen-feeding conditions. What are locally referred to as "households" in this area consist of more than fifty families living within a large fenced residential compound laid out like a street, with contiguous walled courtyards rather than dispersed pastoral homesteads. Livestock production is embedded within this enclosed residential landscape. We visited one such household compound.

The household compound measures approximately 200 meters in length and over 150 meters in width and accommodates 75 head of cattle. The spatial organization of the compound reflects the logic of enclosure and labour efficiency. The eastern section consists of an open yard for cattle; the central section contains brick-built cattle sheds; and another central area functions as a fodder storage facility, where corn stalks and leaves are bundled, compacted, and stacked in square formations. Entering the compound from the north, one encounters a large vehicle scale used for weighing trucks. On the western side are a feed storage building, two small grader-type tractors, and a workshop housing four different feed-processing machines. The family's residential quarters are located at the northern end of the compound. All structures within the compound are built of brick and concrete blocks. Cattle sheds are brick-built, while open enclosures are fenced with iron railings. This is a permanent pen-feeding farm in which livestock are fed year-round within enclosed space. There is no formal numerical limit on livestock holdings; households may raise as many animals as their labour capacity, infrastructure, and feed supply allow. Water infrastructure is privately installed and integrated into the compound. The household drilled a 60-meter-deep electrically powered well at a total cost of 10,000 RMB, including drilling, purification, motor, and piping. Water is distributed throughout the compound via plastic pipes. According to the household, no government permit is required to dig a well within a residential compound, while wells drilled on cultivated farmland require official approval. During spring, summer, and autumn, water storage tanks remain full. This secure water access underpins continuous enclosure and year-round feeding.

Daily labour follows a rigid and repetitive schedule structured around feeding, watering, and cleaning. The household rises at around 5:00 a.m. to distribute hay to the cattle. In the afternoon, at approximately 4:00–5:00 p.m., hay and water are provided again. In winter, watering occurs twice daily: once at 6:00 a.m., after hay and feed are given, and again at around 2:00 p.m., following the second feeding. Calves are kept in a separate enclosure, and calf pens must be cleaned three to four times per day. Manure in the open cattle yard is cleared every four to five days using a tractor and piled elsewhere. All routine labour—feeding, cleaning, manure removal, and maintenance—is performed by household members themselves. The household explicitly identifies itself as a livestock-raising family, and no hired herders or permanent labourers are employed.

Herd composition and reproduction are managed to minimize labour and feed risks while maximizing returns. Of the 75 cattle, 30 are breeding cows. Artificial insemination is conducted manually. At the time of the visit, there were 20 calves. Female calves of good breed quality are retained, while male calves are sold early. Calves are sold once they reach 400–500 jin (approximately 250 kg), usually within four to five months. Calves are not raised into yearlings, and no adult bulls are kept on the farm, reducing long-term feed and labour burdens. Most of the herd consists of breeding cows, with careful attention to reproductive age and breed quality. The household head pointed out a 15-year-old cow that had calved three times within two years, describing it as a high-quality animal. This cow was identified as a fourth-generation Simmental. Crossbreeding follows a generational logic: calves born from Mongolian cattle crossed with Simmental are considered first generation; when these are inseminated again with Simmental, the offspring become second generation, and so on. Fourth-generation cattle are regarded as optimal due to their fast growth, high milk yield, good meat quality, and large body size.

Feed dependence is central to the operation of the farm. Corn, the primary feed base, is prepared in two ways. One portion is self-cultivated. Each person is permitted to cultivate 8 mu of land, with total cultivated area determined by household size. Households that do not

wish to farm their allocated land may lease it to others, and it is also possible to rent land from other households. Labour can be hired for cultivation or livestock care, but most households prefer to do the work themselves, which requires rising early and carefully managing time. Most tasks are now mechanized. The remaining feed is purchased on the market. On average, one cow consumes approximately three tons of feed per year. During winter, when cattle tend to lose weight, additional supplementary feed is provided, significantly increasing costs. Corn is crushed and processed into silage and mixed with specialized feed additives for dairy and beef cattle.

Veterinary labour and disease management are standardized and routinized. The household administers vaccinations and veterinary medicines. Vaccination against foot-and-mouth disease begins in spring and is carried out two to three times per year, or four times annually for larger-scale operations. Two types of foot-and-mouth disease vaccines (Type A and Type O) are used. In total, five vaccines are administered: two for foot-and-mouth disease, one for contagious bovine pleuropneumonia, one for infectious skin disease, and one for brucellosis. These vaccines are provided free of charge by the state and administered in spring and autumn.

Feed prices represent a major structural constraint. Corn feed costs 500–800 yuan per ton. Because land is limited and population density is high, livestock are raised in enclosed pens rather than grazed. The interviewee remarked that cattle grazing on open steppe in Mongolia would likely require an enormous quantity of hay but might be healthier.

Bundled corn fodder is packaged in 25-kg units and fed into crushing machines that remove soil and finely chop the material. Corn is also milled into flour, mixed with crushed corn stalks and specialized supplements, and fed to livestock. Calves and adult cattle receive different feed formulations.

Capital investment is substantial and inseparable from enclosure-based production. Construction of facilities for a livestock operation of over 70 cattle, including buildings and infrastructure, cost more than 300,000 yuan (over 150 million MNT), excluding other expenses. Annual operating costs are estimated at approximately 4,000 yuan per animal. Market values vary sharply by breed quality: high-quality breeding cattle sell for around 10,000 yuan (approximately 5 million MNT), while lower-quality animals sell for 5,000–6,000 yuan.

Livestock, Tax Absence, and Circulation in Inner Mongolia

In Tongliao, Li Ming, a 46-year-old livestock trader with two decades of experience, describes livestock production and trade less through policy texts than through what he repeatedly emphasizes as absence: the absence of tax, the absence of informal pathways, and the absence of wasted animal parts. Within China, buying and selling livestock generates no tax obligation. Neither the buyer nor the seller pays tax, and herders who raise animals and sell live livestock pay neither profit tax nor value-added tax. Although a VAT exists nationally, agriculture and animal husbandry are excluded from it; this tax applies instead to other sectors and to non-agricultural goods. Income tax and VAT are paid by factories and shops, not by herders. If a factory receives a small quantity of milk or meat, tax may apply, but when delivery is large-scale, it does not. Live-animal sales by herders remain untaxed. Only when livestock or meat crosses a national border does tax appear, and even then it is temporary: taxes paid on export can be reclaimed several years later through refund mechanisms for cross-border trade.

Livestock circulation follows a tightly regulated but highly routinized sequence. Truck owners arrive directly at herders' households in Inner Mongolia to purchase animals, which

are then transported to centralized live-animal markets. These markets function as transfer points rather than endpoints. From there, animals are purchased by individuals and companies engaged in fattening or meat preparation. After a period of feeding and weight gain, livestock are sold onward to large slaughtering and meat-supplying companies, most of which are located in southern China. There, animals are purchased in bulk, slaughtered industrially, sorted, and processed. Fresh meat is immediately distributed to meat shops, meat-processing factories, and retailers. Time is critical: meat leaving the slaughterhouse must reach food stores and be sold on the same day. This same-day requirement applies across southern China and, more broadly, throughout the country. At every stage, inspection is stringent. Documentation of origin, disease status, and hygiene is mandatory, and oversight is described as extremely strict.

Individual herders are tightly constrained within this system. A herder is permitted to sell only one cow per year directly and is not allowed to slaughter animals for sale. Slaughter must take place in licensed slaughterhouses, where hides are removed, animals are killed, and carcasses are processed and separated. Meat is sold as meat, bones as bones, through authorized meat shops. Direct hand-to-hand meat sales are prohibited. By contrast, slaughter for personal consumption remains unrestricted: herders may kill and eat their own animals freely. The moment meat is intended for sale beyond the household, however, it must pass through slaughterhouses and meat shops, accompanied by official state documentation, including certificates of origin and stamped approvals. Meat enters the market only with paperwork.

Scale alters access. Owners of large herds—for example, those holding 5,000 cattle—may sign direct contracts with meat-processing factories. Hygiene and sanitation are inspected, but the pathway is clear. Slaughterhouses themselves are never located inside cities; they are built outside urban areas to manage blood, waste, and the risk of infectious disease, turning spatial distance into a component of biosecurity.

Within slaughterhouses, nearly every part of the animal is processed. Blood, intestines, organs, lungs, bones, and hides are separated and transferred to specialized processing companies. Each product has its own buyer: companies dedicated to intestines, hides, lungs, blood, or bones operate under contract and sell onward, under supervision, to restaurants and food establishments. Yet value is uneven. Cowhide, once valuable, is now nearly worthless, selling for around 130 yuan per hide; a bull hide may fetch up to 300 yuan at most. Synthetic leather has largely displaced animal hides in China, leading to the disappearance of hide-processing facilities and a scarcity of buyers. Wool follows a similarly differentiated trajectory. Prices fluctuate annually, but sheep wool sells for about five yuan per jin (0.5 kg), while goat wool (cashmere) sells for around one hundred yuan per jin. Demand for sheep-wool clothing has declined sharply, further reducing its value.

Taken together, Li Ming's account reveals a livestock system characterized by tax exemption at the production stage, strict regulation at points of transformation, and highly segmented value across animal products. Livestock move through the system not as pastoral assets but as regulated units, passing sequentially from herder to trader, market, feedlot, slaughterhouse, processor, and retailer, with documentation, inspection, and timing shaping each transition.

Pastoral family in Zavkhan, Mongolia

In this section, we present an ethnographic vignette from Zavkhan Province to ground our comparative analysis of pastoral livelihoods in Mongolia and Inner Mongolia. Rather

than treating herd size, winter hardship, or market participation as abstract variables, we attend to the everyday organization of labour, mobility, and risk at the household level. The vignette follows a household locally described as having "relatively few livestock," allowing us to examine how pastoral viability is sustained through seasonal movement, labour coordination, and limited but strategic use of cash and supplementary feed. Read alongside the Inner Mongolia vignettes discussed elsewhere in this article, this case provides a critical empirical anchor for understanding how similar ecological uncertainties are navigated within fundamentally different socio-ecological and institutional regimes.

Dalai, a man in his early forties, and his wife Jargal live in Zavkhan Province, western Mongolia, with their three children—two daughters and one son aged between eleven and fifteen. They married in 2010 and have made their living through herding ever since. Their soum lies near Otgontenger Mountain, one of Mongolia's officially recognized sacred mountains, and the surrounding landscape structures both their seasonal movements and their sense of place. Dalai comes from a herding family; both his parents were herders, and he himself is known locally for training racehorses.

When the couple married, livestock transfers from both sides of the family enabled them to establish an independent household. Dalai's side provided 130 head of livestock, while Jargal's side gave 20 head, and they became a household. Over time, their herd stabilized at two stallions and more than thirty horses in total, over twenty cattle, and more than 350 sheep and goats. They migrate year-round and have their own winter campsite. They move between spring, summer, and autumn pastures, migrating at least four to seven times annually. In addition to their more than 300 head of livestock, they own a truck, a motorcycle, and two gers—one winter ger and one smaller otor ger used for long-distance grazing. They also have a fenced house in the soum center. Dalai and Jargal live together year-round in the countryside. Schooling, however, temporarily reshaped their arrangements when the children were very young. Only when the children entered first grade—around six to seven years old—did Jargal temporarily live with them in the soum center. After that period, she left the children to live with Dalai's parents (the children's grandparents) during the school term, while Dalai and Jargal continued herding together.

Within the soum, the household is considered one with relatively few animals, but their pasture access is sufficient. They do not plant fodder or hay. In autumn, they obtain about two tons of hay. For feed, they purchase five 40-kg sacks of wheat bran, which they use in spring to feed breeding females during birthing. One sack of bran costs 48,000 MNT (approximately 13 USD), totaling about 65 USD. For hay, they go themselves to cut it; when gasoline and other expenses are included, this costs 300,000 MNT (around 83 USD). Veterinary medicines and treatments cost 250,000 MNT (around 70 USD). Mobility itself also requires cash. Seasonal moves require truck fuel, and herding relies on motorcycle fuel. When travel is extensive, they use roughly 600 liters of fuel per year, costing about 1.5 million MNT (approximately 450 USD). Livestock sales provide the major cash income. In the current year, meat prices rose, and a 20-kg sheep carcass was selling for 150,000 MNT. That year, they sold more than 140 sheep for 21 million MNT and five cattle for 10 million MNT. From meat they earned 31 million MNT (about 9,000 USD). They also earned more than 7 million MNT (around 2,000 USD) from cashmere from 150 goats.

Their seasonal routine follows a familiar cycle. Around mid-November they settle at their winter campsite. From December through February, they herd on winter pasture, choosing areas with the least snow. The man goes with the animals, while the woman prepares food and tea and, beginning in January, feeds weakened animals. Birthing begins in March. By mid-April, when new grass starts to emerge, they move to their spring pasture, after which

livestock generally grow without major problems. Risk remains ever-present. If snow is heavy and a dzud occurs, livestock losses can follow, and dzud years are understood to occur at intervals of eight to twelve years. In recent years winters have been relatively manageable. The main danger comes when snowstorms last for two to three consecutive days and animals cannot graze, making supplementary feeding necessary. If such snowstorms occur more than three times, herders' stored hay and feed can be exhausted, leading to mass livestock losses. In the warm season, by contrast, animals live without difficulty on pasture grasses.

When income and expenses are listed, livestock sales bring about 9,000 USD and cashmere adds about 2,000 USD. Expenses include 83 USD for hay, 65 USD for feed, 450 USD for fuel, and 70 USD for veterinary medicine, leaving a net balance of about 10,332 USD. Yet this balance sits alongside other costs: because the children attend school in the soum center while Dalai and Jargal continue herding together in the countryside, livelihood expenses increase sharply.

Labour in this household is continuous and coordinated. Dalai watches horses and cattle while also herding sheep and goats, managing the risks of mixing with other households' herds and guarding against wolves. In winter he takes livestock out around 9 a.m. and brings them back to the enclosure before sunset. In the warm season he takes animals out at 6 a.m. and returns them to the enclosure around 7–8 p.m. Jargal processes milk and dairy products and cleans animal pens, working together with her husband and children. This is an ordinary life described locally as that of a middle-level herder household with relatively few animals.

Read in relation to the Mongolian pastoral literature, this Zavkhan vignette documents a pastoral livelihood that has long been recognized but is often under-theorized in contemporary debates dominated by crisis and intensification narratives. As Mongolian ethnographies have consistently shown, herd size alone is not a sufficient indicator of vulnerability or success. What sustains households such as Dalai and Jargal's is their capacity to remain mobile, to coordinate labour across seasons, and to respond flexibly to short-term environmental disruptions.

The vignette also aligns with Mongolian scholarship that conceptualizes dzud as a conditional and socially mediated phenomenon. Winter hardship here does not arise automatically from snowfall, but from the accumulation of consecutive snowstorms that prevent grazing and exhaust prepared reserves. Loss occurs when household capacity—defined by labour availability, timing, stored hay and feed, and mobility—is exceeded. We read this as consistent with Mongolian analyses that frame dzud as an evaluative moment rather than as a uniform natural disaster.

When placed alongside the Inner Mongolia vignettes analyzed elsewhere in this article, the contrast becomes analytically productive. Inner Mongolian households increasingly manage winter risk through fenced pastures, pen-feeding, fodder cultivation, purchased compound feeds, and infrastructural investment under state regulation. Livestock survival there is mediated by markets, capital, and administrative governance. By contrast, Dalai and Jargal's household manages winter risk primarily through spatial strategies—moving animals to snow-light areas—and through sustained human presence with the herd, with feed and hay remaining supplementary rather than foundational.

Differences in schooling arrangements further highlight divergent pastoral trajectories. In Mongolia, children's education introduces temporary and reversible spatial adjustments without restructuring the pastoral economy. Jargal's brief residence in the soum center during first grade did not lead to settlement or enclosure, and the household quickly returned to a fully mobile configuration. In Inner Mongolia, schooling more often coincides with permanent settlement, fixed residence, and deeper integration into enclosed, feed-dependent systems.

Taken together, the Zavkhan vignette supports our broader comparative argument: although Mongolian and Inner Mongolian herders face similar climatic uncertainties, they operate within distinct socio-ecological regimes. In Mongolia, pastoral persistence—even among households with relatively few animals—continues to rest on mobility, labour coordination, and ecological attunement. In Inner Mongolia, pastoral livelihoods are increasingly reorganized around enclosure, feed markets, and administrative governance. We therefore read the Zavkhan household not as a lagging or transitional case, but as an expression of a distinct pastoral logic that remains fully legible within the Mongolian literature while standing in sharp contrast to the intensive systems shaping Inner Mongolia today.

Conclusion

This article has shown that pastoral and intensified livestock systems in Mongolia and Inner Mongolia are distinguished less by productivity or technological level than by the location and structure of dependence. Although herders across both regions face similar climatic uncertainties, the ways in which risk is managed—and by whom it is borne—differ fundamentally.

In Inner Mongolia, enclosure, pasture contracting, and feed-based production have reduced direct exposure to pasture variability, but at the cost of deepening reliance on external systems. Livestock production is sustained through purchased feed, infrastructure, veterinary regimes, and policy incentives embedded within tightly regulated clusters. As livestock numbers decline and production concentrates, fewer households remain directly engaged in herding, and livelihoods become increasingly sensitive to feed prices, subsidy standards, and market access. Risk is not eliminated, but displaced—away from nature and toward institutions, markets, and policy volatility.

In Mongolia, pastoral livelihoods remain exposed to environmental uncertainty, particularly during winter and spring. Livestock survival depends on continuous herding labour, seasonal mobility, and the capacity to respond to short-term ecological disruption. Yet this exposure coexists with a relatively high degree of autonomy. Pastoral households rely minimally on purchased feed and external suppliers, and their livelihoods are not structurally contingent on state subsidies or integrated supply chains. Risk is managed through labour, movement, and social coordination rather than through enclosure or feed-intensive buffering.

The comparison suggests that intensified livestock production should not be understood as a simple solution to pastoral vulnerability. While intensification can reduce grazing pressure and concentrate production, it simultaneously narrows the base of participation, reduces herder numbers, and reconstitutes livestock livelihoods as components of clustered, policy-dependent systems. Pastoralism, by contrast, accommodates larger numbers of animals and people, disperses risk spatially, and sustains livelihoods through labour rather than capital.

These findings challenge linear narratives of livestock modernization. Rather than representing successive stages of development, pastoral and intensified livestock systems constitute distinct socio-ecological regimes with different trade-offs between exposure, autonomy, and control. Understanding these differences is essential for evaluating livestock policy, sustainability, and rural livelihoods in grassland regions, and for recognizing that reducing dependence on nature often entails increasing dependence on markets and the state.

Acknowledgements

We thank the herders, livestock producers, traders, and local residents in the gacha and rural communities of Inner Mongolia who generously shared their time and knowledge, often through anonymous interviews. We acknowledge Acta Mongolica for its constructive peer review. Fieldwork in Mongolia was supported by National University of Mongolia and the ENDOW Project, Economic Networks and Changing Wealth Inequality (NSF Grants 2218860 and 2218861). We also thank the organizers of the International Symposium on Coexistence & Mutuality: Toward a New Pattern of Human Civilization, held at Inner Mongolia Normal University on 8 August 2025. Any remaining errors are our own.

References

Bai, A., & Batsaikhan, J. (2025). Pastoral life in rural Mongolia: Herders' experiences, challenges, and future adaptations. European Journal of Education Studies, 12(12), 227–239.

Bauer, K. M. (2015). New homes, new livelihoods: The political ecology of resettlement in Tibet. University of Washington Press. https://uwapress.uw.edu/book/9780295995046/new-homes-new-livelihoods

Bryan, B. A., Gao, L., Ye, Y., Sun, X., Connor, J. D., Crossman, N. D., Stafford-Smith, M., Wu, J., He, C., Yu, D., Liu, Z., Li, A., Huang, Q., Ren, H., Deng, X., Zheng, H., Niu, J., Han, G., & Hou, X. (2018). China's response to a national land-system sustainability emergency. Nature, 559(7713), 193–204. https://doi.org/10.1038/s41586-018-0280-2

Chifeng Agriculture and Animal Husbandry Bureau [赤峰市农牧局]. (2024). Implementation plan for the grassland ecological protection subsidy and reward policy in Chifeng City [Unpublished implementation plan]. http://nmt.chifeng.gov.cn/

Chifeng Finance Bureau [赤峰市财政局]. (2024). Announcement on the issuance standards for the cultivated land productivity protection subsidy in 2024 [Unpublished administrative notice]. http://czj.chifeng.gov.cn/

Department of Agriculture and Animal Husbandry of Inner Mongolia Autonomous Region [内蒙古自治区农牧厅]. (2023). Detailed rules for the implementation of the grassland ecological protection subsidy and reward policy [Unpublished regulatory document]. http://nmt.nmg.gov.cn/

Gao, S., Duan, R., Wang, H., Li, A., Shi, Y., Jing, H.-C., & Fang, J. (2021). Farming–pastoral ecotone of northern China plays important role in ensuring national food security. Bulletin of Chinese Academy of Sciences, 36(6), 643–651.

Gombosuren, U., Ulziit, E., Adilbish, O., & Khurelchudur, M.-O. (2024). Opportunities to develop the value chain of livestock products in Mongolia. Vestnik KNAU, 5(72), 286–294. Government Documents, Laws, & Unpublished Reports

Horqin Left Rear Banner Agriculture and Animal Husbandry Bureau [科尔沁左翼后旗农牧局]. (2023). Notice on the calculation standards for livestock carrying capacity (in sheep units) [Unpublished local notice]. https://www.hqgov.gov.cn/

Hure Banner People's Government [库伦旗人民政府]. (2023). Public disclosure of the distribution of grassland ecological protection subsidy funds for 2023 [Unpublished financial disclosure]. https://www.kulun.gov.cn/

Inner Mongolia Autonomous Region Grassland Management Regulations [内蒙古自治区草原管理条例]. (2021). Standing Committee of the Inner Mongolia Autonomous Region People's Congress. http://www.nmgrd.gov.cn/

Inner Mongolia Forestry and Grassland Bureau [内蒙古自治区林业和草原局]. (2021). *The 14th Five-Year Plan for grassland ecological protection in Inner Mongolia* [Unpublished government plan]. http://lcj.nmg.gov.cn/

Inner Mongolia Forestry and Grassland Bureau [内蒙古自治区林业和草原局]. (2023). Notice on adjusting relevant subsidy standards for the grassland ecological protection policy [Unpublished policy notice]. http://lcj.nmg.gov.cn/

Kolas, Å. (2014). The nomadic herders of Inner Mongolia. In R. L. Jones (Ed.), The Routledge handbook of Chinese studies (pp. 231–245). Routledge. https://www.routledge.com/The-Routledge-Handbook-of-Chinese-Studies/Jones/p/book/9781138936076

Li, W., & Huntsinger, L. (2011). China's grassland contract policy and its impacts on pastoralism and livelihoods: A case study from Inner Mongolia. Ecology and Society, 16(2), 18. https://www.jstor.org/stable/26268879

Liu, Y., et al. (2023). Promotion and sustainable development of beef cattle. Heliyon, 9, e12721.

Ministry of Agriculture and Rural Affairs of the People's Republic of China [中华人民共和国农业农村部]. (2021). Guidance on the implementation of the third round of the grassland ecological protection subsidy and reward policy [Unpublished policy guidance]. http://www.moa.gov.cn/

Murphy, D. J. (2015). From kin to contract: Labour, work and the production of authority in rural Mongolia. Journal of Peasant Studies, 42(2), 397–424.

Murphy, D. J., & Ichinkhorloo, B. (2023). Index insurance and the moral economy of pastoral risk management in Mongolia. Journal of Peasant Studies.

Naiman Banner People's Government [奈曼旗人民政府]. (2023). Regulations on the spring grazing rest period for 2023 [Unpublished local regulation]. https://www.naimanqi.gov.cn/

Nyamgarav Tseveg-Ochir, N., Lee, K.-W., Woo, J. H., & Choi, B. R. (2024). Review of the current status of pasture-based livestock industry in Mongolia. Journal of the Korean Society of Grassland and Forage Science, 44(1), 58–63.

Scott, J. C. (1998). Seeing like a state: How certain schemes to improve the human condition have failed. Yale University Press. https://yalebooks.yale.edu/book/9780300078152/seeing-like-a-state

Sunite Left Banner People's Government [苏尼特左旗人民政府]. (2023). Implementation plan for the 2023 grassland ecological protection subsidy and reward policy [Unpublished implementation plan]. http://www.sntzq.gov.cn/

Tongliao Forestry and Grassland Bureau [通辽市林业和草原局]. (2023). Work report on the implementation of the grassland ecological protection policy in Tongliao City [Unpublished internal report]. http://lyj.tongliao.gov.cn/

Tongliao Municipal People's Government [通辽市人民政府]. (2022). Measures for the administration of grassland ecological protection subsidies in Tongliao City [Unpublished local regulation]. http://www.tongliao.gov.cn/

Williams, D. M. (2002). Beyond great walls: Environment, identity, and development on the Chinese grasslands of Inner Mongolia. Stanford University Press. https://www.sup.org/books/title/?id=3366

Yang, J., Baoyin, D., & Su, R. (2022). Risk identification from the perspective of South–South cooperation: Evidence from China and Mongolia agricultural technology cooperation. Journal of Social Sciences and Economics, 1(1), 16–23.

Yeh, E. T. (2009). Greening western China: A critical view. Geoforum, 40(5), 884–894. https://doi.org/10.1016/j.geoforum.2009.06.004

Zhenglan Banner People's Government [正蓝旗人民政府]. (2026). Administrative penalty decision for violation of grassland grazing ban regulations (Case No. ZL-2026-015) [Unpublished administrative ruling]. https://www.zhenglan.gov.cn/