

Pastoralism: the custodian of China's grasslands

Scientific evidence is mounting that rangeland degradation is intensifying and expanding in China's rangelands, as a consequence of 30 years of inappropriate policies, as well as climate change. Such policies have simultaneously brought negative impacts to herder livelihoods and to the development of pastoral society. Policies have included grasslands property rights reform, an enforcement of ecological protection, and the settlement of herders into more intensive sedentary livestock production systems. This policy brief explores the effectiveness of the policies based on an analysis of academic papers. It highlights the unique value of traditional pastoralism, particularly in maintaining efficient and sustainable livelihoods, avoiding degradation of the environment, responding to extreme events, and preserving culture and traditional knowledge. The brief recommends the redirection of policy to reflect these values.

Policy pointers

- **Pastoral systems** characterised by high livestock mobility and common property tenure regimes can promote social harmony, economic productivity and sound environmental management.
- **Policies have decoupled** the interaction between livestock production and the rangeland ecosystem which has evolved over thousands of years.
- **Policies should strengthen** pastoral customary institutions and indigenous knowledge, rather than in importing approaches and technologies from western countries that are inappropriate for China.
- **Mobile pastoralism is an** adaptive strategy that can respond to global climate change.

Rangeland management policies

The poverty and rising environmental degradation in China's pastoral areas is of major concern to the government.¹ The response has been a focus on the implementation of property right reform and 'ecological construction' projects to protect the grasslands. The government policies are underpinned by the belief that rangeland degradation is inevitable if the pastoral production system is not modernised; for example holding land in common while livestock are privately owned is believed to lead to a 'tragedy of the commons' thesis. Livestock mobility is perceived by government to be a traditional, but now outmoded, 'coping strategy' in response to pasture scarcity and unreliability; and one that needs replacing with modern production methods to overcome the 'constraint' of environmental variability. The perceived low productivity of the traditional system is what is assumed to be contributing to pastoralists' desire to keep large herds beyond the land's 'carrying capacity' and their immediate requirements.

As a consequence of these perceptions, the state government has implemented a series of measures including a grassland contract system, a 'retire livestock, restore grassland' project, and herder settlement policies

– all of which would purportedly prevent grassland degradation and restore grassland ecosystem functions, while improving herder livelihoods. An analysis of the academic narratives that have explored the impacts of these government policies on the rangeland ecosystem, pastoral production, herder livelihoods and pastoral society has identified some critical issues and concerns.²

1. Grassland Household Contract System (GHCS)

The GHCS is a grassland property rights reform initiated in the 1980s under the market-economic development framework. Grasslands that had been used as common property for thousands of years were allocated to individual households through a contract. Underlying the initiative was the assumption that by clearly defining individual property rights, rights holders would change their behaviour, and manage their grasslands in a way that would promote production efficiency as well as ecological conservation (see Li and Huntsinger, 2011).

Out of 88 Chinese academic papers published on the GHCS since 1983,³ only a minority show support for GHCS' effectiveness in creating improvements to grassland ecosystems (28 per cent). Evidence of improvements to livestock production (28 per cent), livelihoods (33 per cent) and society (9 per cent) are

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also in the minority. Over time the papers have tended to increase their negative viewpoints; for example with regard to the root cause of the policy failure, the number of papers suggesting inappropriate policy design has increased from 13 per cent to 53 per cent.

Scientific research argues that the GHCS is not suited to the dynamic characteristics of rangeland ecosystems – namely, the high temporal and spatial heterogeneity of rangeland

resources – and it also argues that the system causes rangeland fragmentation, degradation and the reduction of rangeland productivity. This may explain why after years of policy interventions and efforts, the overall grassland conditions are still very poor (Annual National Grassland Monitoring Reports, MOA, 2010). Under the policy, rangeland management is decentralised down into individual household units, leading to less herd mobility and more settled pen-raised livestock. Herder ability to cope with natural disasters has been reduced, and the costs for both living and livestock production have increased. A case study in Sonid Left Banner of Inner Mongolia showed that the daily cost of settled pen-raised livestock (1.2 RMB/SSU) is about four times that for mobile livestock (0.32 RMB/SSU) during periods of drought, while the quality of the livestock is not necessarily better. (See Table 1).

2. The *tuimuhuancao* Programme (Retiring Livestock to Restore Grassland)

The *tuimuhuancao* programme, started in 2003, is a major ecological protection project that has brought great changes to the rangeland management system since the initiation of GHCS. Measures include: a year-round grazing ban; grazing rest during spring; rotational grazing, fencing or reseeding grasses to improve ecosystem condition, and coordinate grassland protection and pastoral development. According to the National Grassland Monitoring Report, 2011 (MOA 2012), the central government paid 15.6 billion Yuan cumulatively from 2003 to 2011, and 56.2 million hectares of rangeland was enclosure for *tuimuhuancao* in the pastoral areas by 2011.

A total of 136 academic papers were published on the *tuimuhuancao* programme between 2002 and 2012. Of these, 72 per cent demonstrate support for its effectiveness on rangeland ecosystems and 47 per cent support increased pastoral production during the programme period. However, the percentage of papers showing a lack of support for improvements in herder living levels, and society as a whole, are 60 per cent and 72 per cent respectively. This suggests that although the *tuimuhuancao* programme has had a positive impact on the improvement of the grassland ecosystem,⁴ a majority of academic papers regard the policy as generating high negative impacts on herder livelihood and pastoral society. In response to declining livelihoods, most academic studies suggest shifting herders into intensive livestock production systems and/or alternative livelihood approaches, with increased technical inputs and government subsidies, in order to increase pastoral production and income generation.

A case study in Inner Mongolia illustrates the negative impacts of the *tuimuhuancao* programme. Before the implementation of the programme, the production cost of an individual household relying on pastoralism was approximately 1,296 USD each year. Following policy implementation, where herders are required to pen-raise livestock during grazing bans, the cost of managing livestock increased to 14,578 USD per year. The negative impacts on pastoral society included increasing livelihood risks for marginalised groups – such as poorly educated and low income groups, as well as elderly people and women. With their income immediately reduced following policy implementation, the majority of young people became engaged with alternative incomes sources, leaving old people and children at home without proper care, thereby challenging the cultural system.

3. Herder settlement policy

A herder settlement policy (HSP) has been underway since the collective period (1950s). HSP was implemented as a poverty alleviation programme, mainly targeted at improving herder living conditions. Herders were required to build houses at a winter camp while maintaining seasonal livestock mobility. Since 2006, under the Eleventh National Five-Year

Table 1. Cost comparison of mobile versus pen-raised livestock during drought (Xie and Li, 2008)

	Household A: Moving herds to Greener Rangeland		Household B: Settled Pen-raising	
General information	Herd Size Moved (SSU)	375	Herd Size Fed (SSU)	350
	Pasture Area (ha.)	1053	Pasture Area (ha.)	1044
	Starting Time	Jun. 01	Starting Time	Early Jun.
	Days out	50	Period of Pen-raising (days)	50
Cost analysis	Pasture Rent (RMB)	3500	Hay (RMB)	9375
	Transportation Fee (RMB)	2000	Silage (RMB)	4000
	Animal Watering Fee (RMB)	500	Corn (RMB)	625
	Livestock Loss (RMB)	0	Animal Disease Treatment (RMB)	1000
	Diurnal Cost (RMB/SSU)	0.32	Diurnal Cost (RMB/SSU)	1.2

Plan (2006-2010), the HSP has been expanded to focus on the settlement of both herders and livestock, targeting improved livestock production and herder living conditions, as well as the reduction of grazing pressures on grassland ecosystems. In 2012, the Twelfth National Five Year (2011-2015) Plan for Herder Settlement was promulgated by the State Council, which aimed to settle the remaining 246 thousand households of unsettled pastoralists. Of the total 414 thousand households of herders, the other 168 thousand households have become settled. The implementation of the plan was further reinforced into three categories of implementation: 1. settle in winter camp with maintenance of livestock mobility; 2. resettle to the township; and 3. resettle in a new location totally abandoning of pastoralism.

A total of 72 academic papers were published on the impacts of the HSP between 1986 and 2012. Most are supportive, but highlight problems with the rangeland ecosystem (14 per cent), pastoral production (10 per cent), improvements in herder living conditions (18 per cent), and social issues (36 per cent). Narratives on the poor social impacts argue that the majority of the settled herders are not able to adapt to alternative livelihoods, and instead end up relying on government subsidies. Treating the herders as individual beneficiaries also fails to recognise that they are part of a larger social community, with unique cultural and institutional arrangements. Realising these problems, some local governments have acknowledged the importance of herd mobility and have used settlement project money to help herders buy a mobile yurt/house to increase their efficiency of moving.

Pastoralism's potential contribution

Research papers are increasingly highlighting the need for a new perspective on pastoralism in China. Specifically, there is a need for the 're-recognition' of the uniqueness of traditional pastoralism and its institutional arrangements – particularly in maintaining efficient and sustainable livelihoods, avoiding degradation of the environment, responding to extreme events, and preserving culture and traditional knowledge.

1. *An efficient and sustainable livelihood*

Compared to pastoralism, intensive livestock production systems in China have encountered various challenges, including the increased costs of production (for example, the case of Alashan Left Banner in which the cost of the pen-raising system is 10 times higher than natural grazing system – see Gu, 2012); and poor quality of livestock products (for example, the 2008 Chinese milk scandal). Some economists have criticised the assertion of lower production costs in traditional pastoralism, pointing out that this calculation is due to the 'free' use of rangeland resources. A more important question perhaps is whether or not the concept of consumption from classical economics is appropriate for understanding pastoralist systems: the interaction between grassland and

livestock is a co-evolved and co-adapting relationship, not a relationship of consumer and consumed. Pastoralism is a coupled system in which livestock grazing facilitates ecological processes in the grassland ecosystem.

Another issue to note is that the application of intensive livestock production in pastoral areas is failing to recognise the unique characteristics and qualities of livestock products from pastoralism, especially in terms of food safety. Further, mobile pastoralism also depends primarily on renewable forage resources from rangeland ecosystems, while intensive livestock production systems rely on non-renewable resources like fossil energy. Given global climate change, the sustainability of current pastoral development models should be questioned.

2. *Avoiding environmental degradation*

Mobile pastoralism has co-evolved with dynamic rangeland ecosystems, and as a result rangeland management strategies – such as seasonal livestock mobility and the maintenance of a diverse livestock herd – promote the sustainable use of rangeland resources. Short-term livestock trampling, fertilisation, and movements all serve to assist vegetation decomposition and soil nutrient cycles, thereby improving ecosystem productivity. In contrast, herder settlement with its reduced livestock mobility and intensive livestock production – along with planting of artificial forage – serve as mechanisms of rangeland fragmentation, degradation, and shrinkage. Indeed, studies by Li and Zhang (2009) in Inner Mongolia demonstrate that larger concentrations of livestock in fenced rangeland are one of the main causes of rangeland degradation.

3. *Preserving pastoral culture and traditional knowledge*

The pastoral areas of China encompass diverse ethnic groups – Mongolian, Tibetan, Kazakh, Kirgiz and Tajikistan – each with a rich cultural diversity. The culture of traditional pastoralism has resulted from a long-term interaction with local dynamic ecosystems and social organisations. This pastoral culture and traditional knowledge play a crucial role in how herders develop their institutions, their livestock production practices, and their use of grassland resources. Rangeland policies that 'reform' pastoral society have simultaneously weakened pastoral culture and customs, and changed traditional pastoral living styles (see Figure 1).

4. *Responding better to extreme events*

Mobile pastoralism has developed over thousands of years, co-adapting to dynamic local climate variability and the heterogeneity of rangeland resources. In unpredictable and uncertain environments, the herder's choice of livestock mobility in coping with extreme weather conditions is less costly than providing external inputs of forage and other livestock support resources, as was shown in Table 1.⁵ Some pastoral communities have now initiated a return to the practice of livestock mobility as drought events have increased in recent years, after nearly 30 years of grassland privatisation (Wang, 2011).



Figure 1 After herders settle down they start to engage with modern living and traditional pastoral livelihoods and customs disappear.

Recommendations for policy change

1. Pastoral areas need flexible property rights and diverse institutional arrangements to be able to maximise productivity levels. The GHCS should consider supporting re-aggregation of rangelands according to herders' needs. This can be done, for example, through the development of herder cooperatives and group-tenure management. In pastoral regions where GHCS is not actually being practiced, or not able to be implemented (such as in some regions of Xinjiang and Tibet), it would be preferable to provide policy and legal support to permit herders to continue with existing community-based rangeland management practices, and avoid top-down forces that intervene at the household level.

2. State government should pay the same amount of attention to herder livelihood improvement and pastoral development when considering ecological protection in the pastoral regions. Ecological construction projects should not decouple the interaction between social and ecological systems. The perspective of 'ecological protection being the priority' needs to be reassessed, given the long-term co-evolved interaction between social and ecological systems in pastoral regions.

3. Pastoralism's culture, traditional knowledge and unique institutional arrangements require considerable attention and recognition; the value of pastoral culture and customs needs to be re-discovered in policy development and the design and implementation of herder settlement programme need to be changed accordingly.

4. Traditional pastoral production systems, and their co-evolved social organisations and institutional arrangements, are the result of thousands of years of rangeland management practices in highly dynamic and fluctuating climatic conditions. This system provides a crucial model for global adaptive strategies to climate change. Instead of applying intensive livestock production models, more emphasis should be given to the development of mobile pastoralism models that are adaptive to internal ecological and socio-economic contexts.

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About the project

IIED, in partnership with University of Peking in China, the Revitalising Rainfed Agriculture Network and Rainfed Livestock Network in India, and the Arid and Semi-Arid Lands Secretariat of the Ministry of State for Development of Northern Kenya and other Arid lands in Kenya, is implementing a one-year project entitled *New perspectives on climate resilient drylands development* (2012/13). Funded by the Ford Foundation, the project is researching the assumptions, arguments and evidence that underpin national and global narratives on the drylands in order to formulate more progressive perspectives based on scientific evidence and traditional local knowledge and experience. The views expressed in this briefing, however, do not necessarily reflect the position of the Ford Foundation.

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Notes

■ ¹ According to the 2011 China Economic and Trade Yearbook, in the six main pastoral provinces, around 42 per cent to 53 per cent of the local herders still depend on primary production while the average income per capita is 714 USD. This is 24 per cent lower than the national rural average income per capita (940 USD/person). In addition, the National Grassland Monitoring Report 2010 states that 90 per cent of China's grasslands are degraded to some extent. ■ ² Herder livelihood in this case focuses on the individual level, including individual household income and living conditions, while pastoral society focuses on the community level including social capital and organization. ■ ³ These papers were selected from China Academic Journal Network Publishing Database [<http://epub.cnki.net/kns/default.htm>], being published at key Chinese Journals in Chinese. ■ ⁴ The non-supportive narratives that demonstrate the ineffectiveness of the policy in improving of ecological protection point out that vegetation recovery is observed within the fenced grassland areas, transferring the grazing pressure to the non-fenced grassland areas in which the level of grassland degradation has accelerated. This clarifies the government's perspective that states that "some parts of the grassland has been recovered though the overall has been degraded" (MOA, 2011). ■ ⁵ See also Xie and Li, 2008; Li and Huntsinger, 2011; Zhang and Li, forthcoming.

Further reading

■ Gu, Y.C. 2012. *Assessment on the sustainability of livelihood and grassland restoration under Payment for Ecosystem Service Policy: case study of Grazing Ban Project in Inner Mongolia*, M.A thesis of Peking University [in Chinese]. ■ Li, W.J. and Zhang, Q. 2009. Understanding grassland challenges: discovery of grassland use and management issues at arid and semi-arid regions. [in Chinese: Jiedu Caoyuan Kunjing: Duiyu Ganhan yu Banganhan Caoyuan Liyong he Ganli Ruogan Wenti de Renshi]. *Economic Science Press*. [Jingji Kexue Chubanshe]. ■ Li, W.J., and Huntsinger, L. 2011. China's grassland contract policy and its impacts on herder ability to benefit in Inner Mongolia: tragic feedbacks. *Ecology and Society* 16(2): 1. ■ MOA (Ministry of Agriculture). 2011. National Grassland Monitoring Report. ■ MOA (Ministry of Agriculture). 2012. National Grassland Monitoring Report. ■ Wang, T. 2011. *Analysis on the Impacts of Pastoralists' Adaptive Capacity to Climate Change under Government Interventions: A Case Study in Hexigten Banner, Inner Mongolia*. M.S. thesis of Peking University. [in Chinese]. ■ Xie, Y. and Li, W.J. 2008. Why do herders insist on Otor? Maintaining mobility in Inner Mongolia. *Nomadic People*. 12(2):35-52. ■ Zhang, C.C. and Li, W.J. Forthcoming. Privatisation of rangeland-use rights and herders' adaptation to droughts in the arid Alxa Left Banner of Inner Mongolia. *Journal of Environmental Management*. ■ Zhang, Q. and Li, W.J., 2009. Distributed overgrazing: A neglected cause of grassland degradation in Inner Mongolia. *Journal of Arid Land Resource and Environment*. 22(12):8-16. [in Chinese].

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