



## Local perceptions of grassland degradation in China: a socio-anthropological reading of endogenous knowledge and institutional credibility

Heng Zhao & Karlis Rokpelnis

To cite this article: Heng Zhao & Karlis Rokpelnis (2016) Local perceptions of grassland degradation in China: a socio-anthropological reading of endogenous knowledge and institutional credibility, *The Journal of Peasant Studies*, 43:6, 1206-1223, DOI: [10.1080/03066150.2016.1192609](https://doi.org/10.1080/03066150.2016.1192609)

To link to this article: <http://dx.doi.org/10.1080/03066150.2016.1192609>



Published online: 16 Aug 2016.



Submit your article to this journal [↗](#)



Article views: 117



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)

## Local perceptions of grassland degradation in China: a socio-anthropological reading of endogenous knowledge and institutional credibility

Heng Zhao<sup>†</sup> and Karlis Rokpelnis<sup>†</sup>

As the third contribution in the ‘Land’ section, this paper explores the interactions between institutional credibility and epistemic diversity within grassland management in China’s Inner Mongolia and Ningxia Hui Autonomous Region. It proceeds in two steps. First, a literature review ascertains that privatization of grassland use rights in Inner Mongolia is contested by a local predisposition for pastoral mobility. Advances in rangeland ecology validate the need for mobility, thus highlighting how pastoralists and policymakers have been evaluating the grasslands not only from unequal positions of power but also on epistemologically contradictory terms. Secondly, through a case study of two villages in Ningxia, it is demonstrated that – under equal circumstances of a Grazing Ban – the rural community that uses grassland primarily as a resource to be converted to agricultural production (thus posing a heavier use on grassland) perceives ecological improvement. Contradictorily, the community that is grassland-dependent for herding or opportunistic dryland farming, and is hampered in that use by land degradation prevention policies, does not perceive improvement. The diverging perceptions of degradation among semi-pastoralist communities examined in this study suggest a more participatory approach towards institution-making can bring closer the knowledge and environmental perceptions of various actors, thus opening up opportunities for more credible institutional arrangements.

**Keywords:** Chinese rangeland and natural resource management; grazing ban; institutional credibility; empty institution; environmental perception; epistemic relativism

### Introduction

The credibility thesis (see the introduction to this collection), with its strongly anti-teleological view on institutional development, has significant epistemological implications. In this contribution, we argue that during the endogenous and spontaneous emergence of institutions their function is likewise assessed in *endogenous* terms. As we heed the call to ‘move beyond concepts of formal and informal, private and common, or secure and insecure institutions’ and focus the discussion on institutional *function* (Ho 2014, 1), we need to recognize that the knowledge employed in assessing whether an institution or a whole set of them is functional is by necessity endogenous.

---

<sup>†</sup>Both authors contributed equally to this article.

In this paper we demonstrate that potential differences between emic, that is in-group, and etic, or external, ways of knowing, directly affect the credibility of land management institutions. Using the example of grassland management in the Inner Mongolia Autonomous Region, we demonstrate that differences between emic and etic knowledge can undermine institutional credibility. A juxtaposed, socio-anthropological case study from Ningxia Hui Autonomous Region suggests that an inverse process is possible and that credible institutions can mould local knowledge to accord with etic understanding of landscape processes. Thus, we argue that acceptance of the credibility thesis requires appreciation if not full acceptance of epistemological relativism insofar as the multiple-actor interaction implicit in the generation of credibility allows for diverse epistemic systems to both co-exist and co-evolve.

### ***Grasslands as a prominent example of contested knowledges***

By their incongruent nature, the rules in the game in China's land system have offered a cornucopia of evidence that, when it comes to the creation and persistence of institutions, function indeed comes before form (Dixon 2012). The fluctuation between informal arrangements and formalized tenure of property rights and particularly land in China has been described in detail (Zhang 1997; Ding 2003; Ho and Lin 2003) and does not have to be reiterated here. However, it is worth noting the locus of credibility contestation: while murky and at best tenuous, state land ownership arrangements for Chinese cities have not thus far been observed to impede real estate development and urbanization (Ong 2014). Despite ardent ideological and theoretical suggestions to the contrary, full-scale privatization of the formally collective farmland has not attracted support (Kung 2000; Yang, Zhao, and Yue 2008; Zhang and Donaldson 2013). In other words, the farmland rights system that privatizes use but eschews private ownership could be deemed by and large credible over the past period of reform. However, on China's grasslands following the market reforms, credible institutional arrangements have failed to emerge. The Grassland Law was intended to clarify the ambiguous state-or-collective ownership of grasslands after the collectivist first 30 years of the People's Republic of China (Wang and Wu 2012). In the end, it hardly did so, and instead an empty institution with little impact on the ground was formed (Ho 2005, 73, see also Ho's contribution on the Grazing Ban in this special issue).

Grasslands constitute about a third of China's land mass, and are located mostly in the northern and western parts of the country (Kram et al. 2012, 8). Instead of the Tibetan Plateau's alpine grasslands and piedmont transhumant pasturing in Gansu and Xinjiang, this paper focuses on meadow, typical and desert steppes located mostly in the Inner Mongolian Autonomous Region and the arid grasslands of Ningxia Hui Autonomous Region.

Grasslands are a particularly interesting case for considering the role of knowledge in the creation and persistence of institutions. It has been argued that in China, as in other parts of the world, attitudes and knowledge about grasslands are nowhere near uniformly shared among local inhabitants, state administrators and third-party players, such as academic researchers and non-governmental activists (Thomas and Twyman 2004; Taylor 2012). This differs from the case of farmland in China, where, arguably, despite on-going land-use conflicts, the system is underwritten by a shared understanding of what constitutes proper land usage by those farming the land and those who rely on access to land for uses ranging from urban planning to small-scale real estate speculation (Ong 2014). Land is commonly seen as a basic input into value creation and a rational livelihood (Wang 2005).

Quite what constitutes and embodies local knowledge or the emic perspective (Harris 1976), and even what it should be called, is a matter of on-going debate. Scott suggests

that *metis*, ‘a wide array of practical skills and acquired intelligence in responding to a constantly changing natural and human environment’, allows individuals to fine-tune their activities within larger social systems. Without such adaptations, systems such as manufacturing and bureaucracies become unviably cumbersome (Scott 1998, 313). Lévi-Strauss argues that the lived experience of all people constitutes a science of the concrete by seeking knowledge that extends beyond immediate practical needs, and proposes this kind of knowing as an equally valid alternative to the intentional abstraction of positive science (Lévi-Strauss 1966, 22). Applied specifically to the knowledge of ecological systems, a wide variety of terms has been used, usually evoking tradition or locality along with notions of indigeneity (Berkes 2012).

The extent to which knowledge is treated as communal differs between, for example, the *metis* of an individual factory worker and, to take another extreme, the capitalized Traditional Ecological Knowledge requested in some countries as input in institutionalized co-management of natural resources (Nadasdy 2003). Yet one cannot fail to notice that epistemic contradictions tend to be most prominent in situations where there is a ‘great historical divide between communities rooted in the land and those caught up in our contemporary global flows of capital, labour, and commodities’ (Hunn 2007, 8). Judgment of what constitutes degradation versus recovery or sustainability versus plunder takes place at the nexus of the interactions between what Hunn calls ‘communities’, or ‘actors’ in institutional evolution terminology. We term this epistemic space ‘endogenous knowledge’,<sup>1</sup> meaning the knowledge interactions that directly pertain to the endogenous emergence of institutional arrangements. While it undoubtedly makes sense to speak of emic and etic knowledge differences in land management, for example individual herd size management decisions versus landscape-scale stocking rate calculations by government or aid organizations (Campbell et al. 2006), both are directly connected to the formation of institutions and are thus endogenous to the process.

What is at stake is the recognition that knowledge of ecosystems and the natural resources and services they provide can be both concretely local and abstractly generalized. Actors involved in the game with institutions as its rules (Ostrom 2009, 17) will be judging the validity of those rules based on their own knowledge disposition somewhere along a spectrum of forms of knowing. Using participant observation and cultural domain analysis methodologies (Borgatti 1994), Fernandez-Gimenez has shown that ‘broadly shared ecological knowledge’ exists among current day herders in Mongolia and that ‘herders clearly articulate the relationship between local environmental conditions and their nomadic resource management strategy’ (2000, 1319). Aspects of such knowledge and practices, such as reciprocity, might be maintained by communities after taking on a settled lifestyle (Conte and Tilt 2014). This conclusion provides explanation to an observation and at the same time a plea ‘that pastoralists are often knowledgeable about their environments and capable of regulating resource use among themselves’ (Fernandez-Gimenez 2000, 1318).

In the coming pages we will demonstrate that the relationship between emic and etic knowledge shapes institutional credibility. First, a review of previously published literature on grassland management by nomadic herders in Inner Mongolia will be discussed to illustrate how a collision between local knowledge and external analysis and disregard for the

---

<sup>1</sup>It should be noted that this use of ‘endogenous knowledge’ is a radical departure from using this term as an equivalent or even enhancement over ‘local’ or ‘indigenous knowledge’, as some have proposed (Grossman and Devisch 2002).

differences has led to the creation of empty grassland ownership institutions. We will then describe an original case study on the perception of land degradation management in Ningxia Hui Autonomous Region. The results of that case indicate that the emic perception of institutional arrangements is shaped by the approach taken for creating institutional arrangements. Building on that observation, we will argue that an approach that involves and benefits local players can align local perceptions with etic knowledge, and increase the credibility of institutional arrangements.

### **Epistemological differences as the root of the emptiness of Chinese grassland institutions**

The Inner Mongolian grasslands of today have historically been part of a larger socio-ecological steppe system known for nomadic grazing-based lifestyles and cultures, subsumed under the Mongol ethnonym since the thirteenth century (Lattimore 1947). While very little is known about the grazing land management during the early Mongol period, according to a historic review of grazing regulation institutions by Fernandez-Gimenez, over time emergent nobility and Buddhist monasteries increasingly asserted control over land management in the steppe both through land ownership claims and controlling grazing arrangements (Sneath 2001). Increasingly stringent allocation of lands to nobles, particularly with the onset of Manchu control from Beijing, indicates a gradual move toward formalized land tenure at the macro level, although movement between nobles' domains was accepted in cases of hardship, particularly caused by weather (Xie and Li 2008). At the grassroots level, contradictory accounts describe more or less organized grazing communities constantly on the move (Fernandez-Gimenez 2010, 324). One conclusion is that up to the establishment of the People's Republic of China, to borrow vocabulary from Scott, increasing efforts to create administratively *legible* polities (Scott 1998, 6) on the grassland have historically accommodated local arrangements based on local understanding of the grassland.

Grasslands were legally made public property during the Land Reform in the 1950s, albeit without an existing definition of what constitutes public ownership, and only well after the turmoil of the Cultural Revolution were grasslands redefined as state-owned in the 1982 constitution (Ho 2005, 83). Further grassland reform came as part of the 1980s market reform, which started in the rural agricultural areas, but soon swept along the rangelands down a controversial path of privatizing grazing animals and the use rights of state-owned pastures (Yeh 2005).

The two-fold failure of this development has been well documented. Firstly, contradictory ownership claims between collectives and the state have rendered much of large-scale grassland ownership disputes unresolvable.<sup>2</sup> If indeed the grassland institution reforms were carried out to strengthen institutional stability thus reducing economic transaction costs and therefore enhancing the 'performance of [the grassland] economy' (North 1990, 69), such gains have not materialized (Li and Huntsinger 2011). As such, the concept of state ownership of grasslands is an empty institution insofar as it is stated in law and reiterated by officials and the representatives of the collectives despite recognition that full state ownership contradicts existing collective ownership claims and is *de facto* unenforceable.

---

<sup>2</sup>The collective is a contradictory entity on its own, since Chinese legal code does not include a precise definition of what constitutes collective ownership, and permits various permutations of collective title holders and management arrangements (Ho 2001, 406).

Secondly, allocation of use rights to state-owned grassland and subsequent incentivized enclosure of that land in parts of Inner Mongolia has created patches and regions where the use of at least some of the land has been assigned to households for exclusive use. This has led to decreased mobility and therefore more intensive grazing on some pastures, thus enhancing the overgrazing and degradation the reform was supposed to resolve by terminating the presumed ‘tragedy of the commons’ (Christensen, BurnSilver, and Coughenour 2005, 140). Given that actual posts and barbed wire are divvying up the land, this institution is obviously not empty, but instead it is non-credible since the rules it embodies are not perceived as common (Ho 2014, 7) and hence are seen as failing their stated purpose, particularly in terms of sustainable use and conservation (Yang and Wu 2012). Emic ecological knowledge is routinely cited as the reason for rejecting the imposed institutional arrangements in Inner Mongolia (Menghewuliji 2013; Tang and Gavin 2015).

The role of epistemic contradictions is particularly salient in the grassland ownership case since advances in ecology over the last few decades have confirmed the validity of the traditional predisposition toward pastoral mobility. Notably, the first version of the Chinese Grassland Law was promulgated somewhat before the academic emergence of disequilibrium understanding of grassland ecology in areas with significant inter-annual precipitation variation (Derry and Boone 2010). This change called for a re-appreciation of pastoral mobility, which from a wasteful and irrational atavism came to be seen as rational adaptation to a stochastic environment (Adriansen 2005). Adaptation to unpredictable variation, particularly in the form of mobility, fundamentally challenges the neo-liberal penchant for clearly defined and preferably exclusive control over the bundle of rights that constitutes land ownership (Banks 2001; Taylor 2012). Put another way, need for mobility redefines the meaning of ownership or tenure, because, as Fernandez-Gimenez has pointed out, an ‘institution that regulates mobility may constitute a *de facto* tenure regime by indicating when, where, and for how long grazing may occur’ (2002, 53).

The take-away lesson from the rise of the mobility paradigm and the subsequent ecological substantiation of it is that unconditional forcing of an etic understanding of grassland dynamics upon a rationally opposing emic grassland knowledge system determined the emptiness and non-credibility of the grassland management framework.

### **Divergent perceptions and the non-credibility of the Grazing Ban in Ningxia**

South of the Inner Mongolian steppes, Ningxia Hui Autonomous Region offers a very contrasting example of grassland management. An area historically characterized by grassland landscape and pastoral economy, in the twentieth century Ningxia has become a comparably densely populated region that is intensely farmed while maintaining grazing as a side-industry (Ho 2000). Concurrent with the rise of land cultivation came a concern for land degradation (Mitchell et al. 1998), which has become an integral concern within the larger framework of sustainable development for Western China (Yeh 2009).

A major component of land management in Ningxia is a ban on open grazing (Dong et al. 2007), which has been in place since 2003 (Zhou 2013). The ban stipulates that animal husbandry be limited to enclosed pens and no open grazing be permitted in certain time periods set by the Autonomous Region’s People’s Government (Ningxia Hui Autonomous Region grazing prohibition ordinance [Níngxìà Huízú zìzhìqū jìn mù fēng yù tiáolì] 2011 Article 8). In practice, clear time limitations are not implemented. Instead, enforcement is tightened in the key phases of the forage growth cycle.

This approach has been found to be effective: applying normalized difference vegetation index (NDVI) analysis to satellite data, Li et al. have reported high grassland

recovery success rates for central and northern Ningxia: a decline of overall desertified grassland area and a sharp drop in severely desertified grassland area between 1993 and 2011 (2013). The annual decrease of total desertified grassland had been at the rate of 1.87 percent for 2000–2006 and 0.61 percent for 2006–2011.

Li et al. concluded ‘that grassland desertification in Ningxia has reversed during the past two decades. The vegetation is in a state of recovery, and the grassland environment has achieved marked improvement, especially after the 2003 region-wide Grazing Ban was implemented’ (Li et al. 2013, 24). The authors note that this is particularly remarkable given that during this period the mean annual precipitation decreased and medium temperature increased, both of which should lead to a reduction in bio-productivity (Li et al. 2013, 25).

Yet this view contrasts sharply with those held by farmers and herders in southern Ningxia, as reported by Ho and Azadi, whose survey showed that

the majority of respondents (264 pastoralists, 93.1%) believe that their rangelands (compared to 5 years earlier) have ‘degraded’ while only 11 (3.6%) and 9 (3.3%) of the questioned pastoralists evaluated the [rangeland trend] at the ‘stable’ and ‘improved’ levels, respectively. (2010, 304)

More importantly, elsewhere it is argued that perceived ecological failure of the policy coupled with on-going efforts to enforce it has led to a *non-credible* Grazing Ban, emergence of which is explained with the failure of the state to provide adequate compensation that could otherwise have replaced the function of grazing (see the contribution by Ho (2016)).

While congruent with the premise that credibility of institutional arrangements stems from function, such an assessment leaves us with a cliff-hanger: either the grassland improvement derived from NDVI analysis or the farmer reports about increasing degradation must be off kilter. That is, of course, unless we are to accept that the same situation is seen diametrically differently by the two different stakeholder groups and that their perceptions are indeed real. In other words, the truth about the grassland condition trend must be relative or, alternatively, one of the stakeholder groups must be in the wrong intentionally or by mistake.

Precisely such divergent perceptions of grasslands have been reported between the previously mobile pastoralists in Inner Mongolia and non-local scientists working in the region. Williams found that not only are Mongols likely to prefer a patchy landscape with a certain amount of exposed sand, but they would also estimate grassland recovery to be faster than what the scientists reckoned for the same photographed areas (2002, 8). If mismatching understandings of grasslands have led to the emptiness of grassland ownership institution reform, might similar divergence be the cause of the non-credibility of the Grazing Ban?

### *A case study of two villages*

A comparison of two villages from the opposing ends of Ningxia can shed light onto this quandary. The two locations share common features in terms of being areas of land degradation concern. Extensive land amelioration and conservation programmes have been applied to both, while grazing is similarly restricted.

SKL<sup>3</sup> is located in the northeastern Pingluo County east of the Yellow River on the boundary between the fertile Yellow River valley and the arid and sandy Ordos Plateau

---

<sup>3</sup>SKL and DGY are place name abbreviations. Full names are not provided in order to preserve a level of anonymity to the communities and individuals involved in this research.



Figure 1. The approximate location of the two study sites in Ningxia.

Steppe (see [Figure 1](#)). One out of three natural villages in the administrative village, SKL was established in the 1980s, when a community of Han farmers was moved from hilly southern Ningxia to farm the desert's edge and turn it into farmland using water from the nearby Yellow River. The land conversion involved levelling of previously not farmed sand dunes and establishment of irrigated fields, which has resulted in a mosaic of irrigated paddies, salty marshes and remaining sand dunes. An initially fraught process during which many settlers returned to their hometown has eventually become a recognized model resettlement community for a larger on-going ecological resettlement scheme in the autonomous region, which is expected to affect 346,000 people in the 12th Five-year Guideline period (2011–2015) alone ([Wu 2012](#)).

In SKL, farmers benefit from land amelioration directly through the ability to farm land that has been successfully reclaimed from the desert and improved. Many are employed in afforestation projects as day labourers, and some with more advanced skills work on construction and maintenance. Raising tree saplings on agricultural land provides extra income.

Those with sufficient clout and resources can take the initiative to reclaim large plots of desert land and assert their ownership of the land through such efforts.

DGY is a dryland community in southern Tongxin County. It too is a target of a resettlement scheme, but unlike SKL, migrants are moved from the hills into lowland areas within the administrative village boundaries. The focus of this research is a natural village that consists of an older section and a newly built planned relocation village. According to the DGY village committee reports, the entirely Hui Muslim community that further divides into several denominations of Sunni Islam with strong Sufi influence relies on farming and animal husbandry for the majority of their income. The administrative village has three different topographic levels: (1) the higher hills have been slated for removal of communities and natural re-vegetation, and the plan has been largely implemented although some farmers still farm the more fertile of the dry-land farm plots in the hills, and illegal grazing persists; (2) at the mid level land has been ameliorated and infrastructure has been built to eventually provide drip irrigation to the old main village and the resettlement village that was built right next to it in 2008; and (3) at the lowest level, a recently built canal supplies water to irrigated fields. This has attracted many of the farmers to move down from the mid and higher natural villages to the Qingshui river plane despite no land being officially designated for residential buildings in the lower section of the village. Until the canal was built in 1996, all three zones had been fully reliant on rainfall for household and farming water use, and farming was opportunistic and sporadic depending on the availability of moisture.

After the internal relocation, most farmers in DGY have been significantly restricted in their access to land resources. Former dryland farming plots in the hills have been abandoned both in compliance with policy and due to the impracticality of farming at a considerable distance from the new living quarters. Due to relocation, land nearby the village was reallocated, thus reducing the availability of land to everyone. Infrastructure improvements were promised as part of the relocation but have largely failed. A new irrigation system was built but is faulty and does not function.

The two villages share similar, largely agricultural livelihoods and, while religiously and ethnically different, the communities by and large live in similar ecological conditions. Both areas are designated restoration sites, but approaches are different: in SKL farmers are encouraged to farm the desertified land and improve it, whereas in DGY they are incentivized to withdraw from their land in order to improve it.

### ***Respondent profile***

Field work was conducted in the two locations between the winter of 2013 and winter of 2015. Following a period of participant observation and unstructured interviewing, 50 structured interviews were conducted (15 in DGY and 35 in SKL, the numbers difference arising from enlisting the village school principal to assist and thus greatly increasing access and speed of interviewing at SKL). The results between the two villages were cross-tabulated, and Chi-square test used to evaluate whether there is a statistically significant difference between the survey samples in the two communities (Bernard 2006, 609). This analysis, shown in [Table 1](#), confirmed the socioeconomic similarities of the two communities and the differences in perceptions of land management outcomes ([Figures 2 and 3](#)).

All respondents stated that they owned land, but major differences could be observed in terms of farming it: in SKL, all but one respondent farmed their land, whereas in DGY one third did not. While almost all residents of SKL had land (use) title confirming documents,

Table 1. Respondent profile and summary of responses.

	DGY	SKL	<i>p</i>
<i>n</i>	15	35	1.000 <sup>a</sup>
Female	3	7	
Elementary education or no schooling	6	18	0.152 <sup>a</sup>
Primary education	3	9	
High school	1	2	
University	0	1	
Average age	48	44	0.335 <sup>b</sup>
Cultivate personal land	15	35	1.000 <sup>a</sup>
Have full documented proof of land ownership	10	33	0.008 <sup>a</sup>
Have partial documented proof of land ownership	2	1	
Livelihood changed after reforms	2	6	0.245 <sup>a</sup>
Off-farm employment: none	9	24	0.811 <sup>a</sup>
Off-farm employment: in-county	4	8	
Off-farm employment: regional	2	3	
Off-farm employment: skilled labour	3	2	0.301 <sup>a</sup>
Off-farm employment: small trade	3	9	
Receive farm subsidies	14	32	0.916 <sup>a</sup>
Affected by land degradation prevention policies	8	12	0.163 <sup>a</sup>

<sup>a</sup>*p* value of chi-square test; <sup>b</sup>*p* value of unpaired *t*-test.

one third of the DGY residents reported having either no (20 percent) or partial (12.33 percent) documentation for their land use, which appears to be due to lack of administrative follow-up after having resettled.<sup>4</sup>

More than 78 percent of SKL respondents reported not experiencing change in their livelihood manner since the reforms in land ownership. However, one has to note that the village was established post-reform and therefore does not provide for an easy comparison between before and after 1978 reforms. All DGY respondents reported post-reform changes to their livelihoods.

Precise data about the income levels were virtually impossible to obtain. The SKL village committee does not routinely release income data to the public, while the data for DGY can be very contradictory and differ by orders of magnitude for the same indicator. Instead, we used off-farm labour as an indicator of socioeconomic circumstances. There were no significant differences between the two communities either in terms of types of work skills that individuals have (Chi square 0.81) or distances to work locations (Chi square 0.3). This confirms the field observations of lifestyles and consumption patterns that the communities should be considered similar in terms of off-farm income.

Ninety-three percent of the respondents reported receiving subsidies, with an insignificant difference between the two villages. Most respondents reported receiving staple farming subsidies, while some households in DGY reported subsidies and compensations for abandoning farming or living in a hardship area. This eco-compensation was provided intermittently to two families who had relocated away from the hills, but was reported at RMB 500/household and thus amounted to less than even the average staple foods subsidy provided to most other households in the sample.

<sup>4</sup>Legally speaking, herders and farmers in China can only lease grassland and agricultural land from the rural collective. Thus, land ownership remains with the collective, while individuals are granted the right to use land.

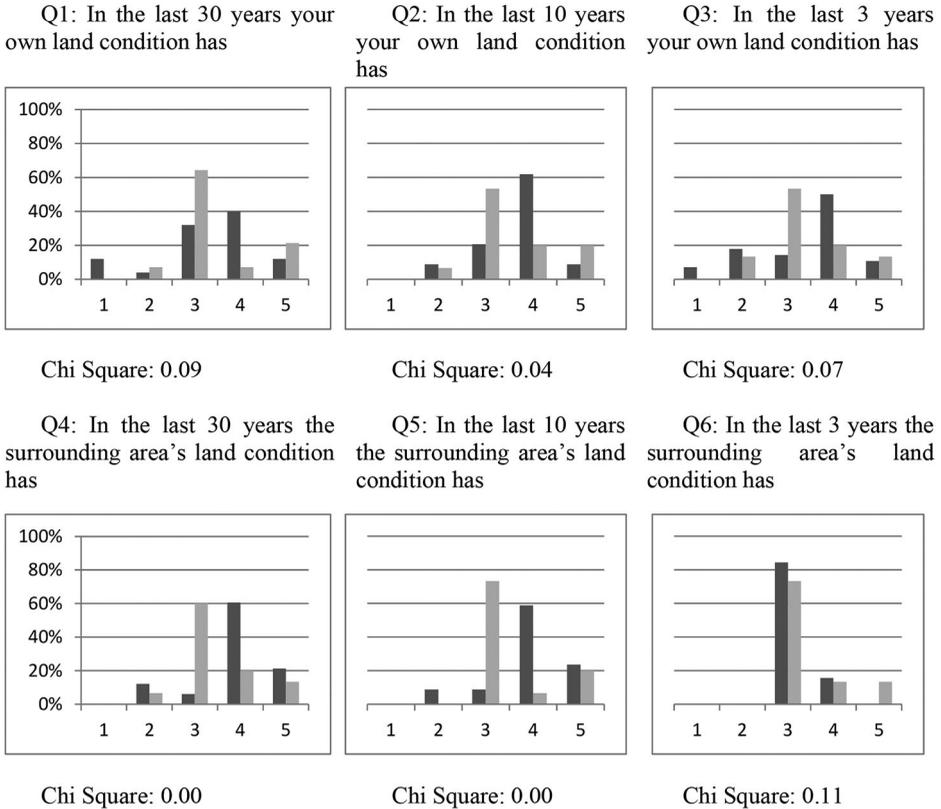


Figure 2. Evaluation of land conditions compared between DGY ( $n = 15$ ) and SKL ( $n = 35$ ). Questions 1 to 6.

Notes: Light grey represents DGY; dark grey represents SKL. 1 = become much worse; 2 = become somewhat worse; 3 = no change; 4 = become somewhat better; 5 = become much better.

In SKL, 35.29 percent of respondents reported being affected by land degradation prevention policies, while 57.14 percent said they had been affected in DGY. This difference was not statistically significant (Chi square  $p = 0.16$ ). Only one respondent reported having community relationships affected by land policies. When asked to prioritize between three aspects of livelihoods, ‘irrigated farmland’, ‘dry farmland’ and ‘large herd of grazing animals’, in diminishing order of priorities, were shared between the communities.

Overall, the respondent sample appears to be highly similar between the two sites. Basic demographic indicators such as age, education and gender did not differ. While land ownership did not differ, actual access to land for farming and the documentation of land use did.

**Evaluation of land conditions**

Overall, SKL respondents evaluate their personal conditions and the village land as improving over time, whereas DGY respondents are more likely to report no change to land conditions, except for the last three years where both samples mostly reported no difference over the given time period. As can be seen in Figure 2, the differences between samples are statistically significant (Chi square at 10 percent level) for question 1 (Q1), Q2, Q3, Q4 and Q5, but not for Q6.

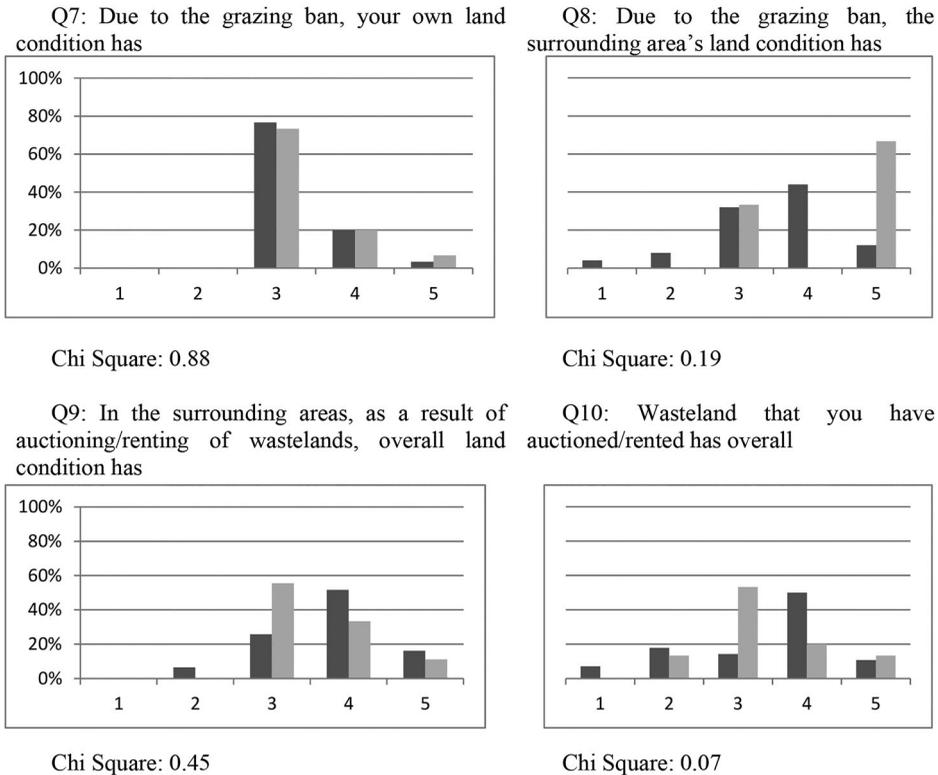


Figure 3. Evaluation of land conditions compared between DGY ( $n = 15$ ) and SKL ( $n = 35$ ). Questions 7 to 10.

Notes: Light grey represents DGY; dark grey represents SKL. 1 = become much worse; 2 = become somewhat worse; 3 = no change; 4 = become somewhat better; 5 = become much better.

In Q7 the vast majority of respondents from both samples indicated that the Grazing Ban has not affected the conditions of their land. Q8 contradicted the answers for Q7: unlike their own land, over half of respondents from both groups reported improvement in their surrounding lands. The difference between groups is not statistically significant at 10 percent.

In Q9 and Q10, a similar pattern to Q1–Q6 re-emerges: most DGY folks do not state any differences to either their or surrounding wasteland conditions, while SKL respondents tend to see improvement. Only for Q10 are differences between the two communities statistically significant at 10 percent.

Overall, a clear pattern can be discerned: DGY respondents view neither their own nor the village's land as degrading or improving, while SKL respondents claim an improvement. The one exception, Q8, where a large share of DGY respondents do state that significant improvements have taken place, might be explained by their inclusion of irrigation projects in the valley section of their village and removal of all grazing activity from that section of the village land (the differences for Q8 between the two samples are not statistically significant at 10 percent).

This survey showed that at two sites that are declared degraded and in need of recovery, the impacts of the implemented approaches (encouraging active cultivation in SKL and abandoning of land in DGY) were valued differently. SKL residents were seeing a recovery

of their land in both the long term (30 years) and the medium to short term, whereas by far the majority of DGY residents say that they have not noticed any changes, and a small minority reports improvement. Most respondents in both communities asserted that the Grazing Ban has had no impact on their own land, yet conceded that overall land conditions in their villages had improved. Most respondents in DGY saw marginal wasteland for which they had personally acquired exclusive use rights as not having changed, and a minority claimed improvement, whereas SKL respondents reported inversed results. Overall, both communities showed internally conflicting evolutions of personal land versus the overall village land trend, but SKL, which is encouraged to engage with land degradation rather than abandon land, is claiming success whereas DGY is claiming no change.

Nuanced differences between the two villages can be observed when examining the reported livestock numbers: DGY respondents held on average 22.29 sheep, and counting other livestock, such as cattle or donkeys, 27.38 sheep unit equivalents.<sup>5</sup> SKL folk had 15.71 sheep around the house (student's *t*-test  $p=0.22$  for comparison to DGY) and 16.33 sheep unit equivalents (student's *t*-test  $p=0.03$  for comparison to DGY). At the same time, three respondents out of 15 in DGY claimed that they had given up herding because of grazing restrictions while only one out of 35 reported the same at SKL. The community with the larger livestock herds is reporting a higher incidence of ceasing grazing due to the ban, which corresponds to the only 35.29 percent of respondents in SKL and 57.14 percent in DGY who reported being affected by land degradation prevention policies, although the latter difference is not statistically significant at 10 percent (Chi square  $p=0.16$ ). While these estimates are lower than the Grazing Ban impacts reported by Ho (2016, see this volume), higher impacts can be seen in the community that is more reliant on grazing (maintains larger herds), is affected by restrictive rather than developmental approach of land degradation control, and has not been provided either with clear land-use right ownership documents or effective compensation for the incurred livelihood losses from land degradation prevention policies.

Perception difference was assessed using visual cues (photographs) that were freely pile-sorted according to degree of degradation (Bernard 2006, 311) and then analysed using multi-dimensional scaling (Bernard 2006, 681). A mixed set of 11 pictures of land plots from both areas were used, and respondents were asked to sort the images according to their perception of which land plots were equally degraded. Ten of the individuals who were interviewed for the questionnaire in DGY participated in the pile-sorting exercise; 31 of the interviewees in SKL participated in the pile-sort. As a control and comparison, nine staff members of DGY village's county grassland management station were asked to participate in the pile-sort exercise. The sample sizes are sufficiently large for the analysis (Rodgers 1991). The pile-sort data was fed into multidimensional scaling (MDS) for respondents using Visual Anthropac 1.0.2.60. The two-dimensional scaling of the 50 nodes was obtained in 33 iterations, with a high stress level of 0.256. However, this value is well below the 0.366 cutoff for 50 nodes in two dimensions suggested by Sturrock and Rocha (2000, 58).

In other cases, consistent perceptible differences have been observed based on land and ownership status and other forms of 'social differentiation of communities' (Reed and Dougill 2002, 232). Given the divergent predispositions of the two communities, the possibility that the respondents in the two communities cognize similar changes differently cannot be ruled out.

---

<sup>5</sup>Calculated using conversion standards provided in the Ministry of Agriculture standard NY/T 635-2002 'Calculation of proper carrying capacity of rangelands' Addendum A.

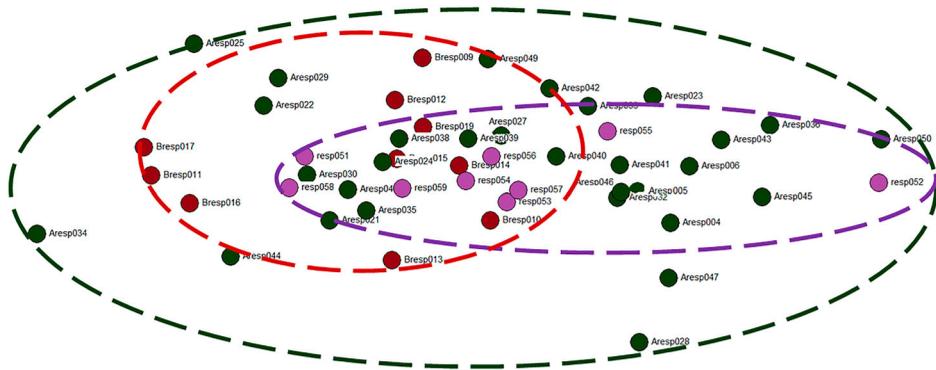


Figure 4. Multidimensional scaling plot for the pile-sort of 11 land condition pictures. Respondent labels starting with A (green dots in online colour version) are respondents from SKL, respondent labels starting with B (red dots in online colour version) are respondents from DGY. Respondents labels without a capitalised starting letter (purple dots in online colour version) are grassland work station staff. There are 50 nodes and 33 iterations; stress 0.256.

As can be seen from Figure 4, the pile-sorts from DGY respondents clustered tightly, as did the control group. Such close overlap between local and specialist classification has been observed in other applications of this method (Molnár 2012), although most of the staff members at the grassland work station have limited technical training and might be best thought of as well-informed lay individuals rather than grassland experts. Comparatively, SKL respondents were much more spread out, indicating a lower level of agreement about which of the provided images represent the same level of degradation. While some individuals from the SKL sample sorted the visual cues similarly to the individuals in DGY and the test group, overall the SKL sorts had a much higher scattering and did not form a clear cluster. The MDS results can be interpreted to mean that there is a higher level of agreement about what constitutes degraded land in DGY, whereas more diverse views were seen in SKL.

This difference coincides with differences in average herd size and the higher frequency of decisions to terminate herding as a livelihood activity in DGY. It is striking that after years of land degradation prevention policy implementation, the more grassland-dependent community that is being displaced by these policies does *not* report improvement while the one that benefits from policies that favour the use of grasslands for agriculture does claim ecological improvement.

An interview conducted in July 2014 with a local elder of Hui Muslim descent, his status indicated by him being the only individual in DGY to have gone on the Hajj, is illustrative. When asked about degradation of the local land, he said: 'Degradation here is different. There is no degradation here'. He then went on to describe the degradation in nearby villages that had been enrolled in ecosystem payment schemes and then reiterated that there is no degradation at DGY since there is, paradoxically, no compensation in place.

## Discussion and conclusions

Testing the validity of one epistemic system against a competing one is generally a questionable practice given the discursive power inequalities at play (Brook and McLachlan 2005; Gratani et al. 2011). However, advances in grassland ecology make for a salient

case study. Local insistence on needing pastoral mobility and flexible boundaries has ultimately been shown to be justified through the replacement of the equilibrium ecology paradigm by a more nuanced understanding of rangeland dynamics (Vetter 2005). Grassland management and the mobility paradigm in Inner Mongolia demonstrate the full extent to which management assumptions and institutional design ambitions that do not acknowledge the validity of diverse epistemic systems have failed to produce institutions that could possibly be credible. Such an approach can also lead to subtle or outright resistance (Williams 2002; Baranovitch 2016).

Non-credible institutions come about when implementation is forced through under conditions of unequal power relations. While empty institutions can be conceptualized as no actor being able to fulfil their vision yet everyone getting the satisfaction of having the arrangement to either *look* or *feel* according to their preference without actual implementation, in the case of the Grazing Ban, the policy *is* implemented, albeit not consistently. Interviews with farmers, and township and county officials, in the two villages confirm that the Grazing Ban is implemented and sanctions applied despite farmer dissatisfaction and the unwillingness of township officials (who are in charge of routine enforcement) to enforce them due to pre-existing personal relationships with villagers or concern for having to provide livelihood alternatives if grazing is not permitted.

However, potential for adjustment can be seen, if indeed a consensus on the desired function can be achieved. The socio-anthropological case study of diverging perceptions of land management outcomes at DGY and SKL suggests that active involvement of stakeholders even when imposed from above can alter the emic perception and align it with the etic view. With county grassland management authorities claiming overall land degradation and subsequent vegetation cover regenerating in *both* areas but a divergent pattern of perceptions of the Grazing Ban's results, the question arises as to what to make of the diverging land condition trend assessments. In this case, the community that was *less* constrained by the Grazing Ban and other land degradation prevention programmes while directly engaged in agricultural production was seeing more improvement. Contradictorily, the community that was more reliant on the resource that the Grazing Ban and other land degradation prevention measures restricted them from was seeing neither negative nor positive change. The provision of the incentives and thus a harmonization of etic and emic understandings of the institutional function appears to be what is needed for establishing credibility of an institution at the perception level.

The farmer cited earlier effectively refused to become what Agrawal has called an 'environmental subject' (2005, 181) by rejecting the existence of a basis for ecological intervention. And he pointed to the intervention mechanism that is present at another location as the key proof that intervention was needed there. This logic, of intervention itself rather than presence of degradation being the ultimate proof of the need to intervene, appears as an unsettlingly unreliable heuristic device for detecting degradation. But it is so only insofar as one maintains a very strict division between 'natural' phenomena constituting degradation, such as changes in vegetation, and 'cultural' human action such as the credible commitment from government authorities to compensate the inconvenience of having to formally counter land degradation. Taken at its face value, to borrow Rappaport's somewhat dated analytical framework (Rappaport 2000, 238), within the 'cognized model' of the interviewee's experience, the ostensibly exogenous governmental intervention should in fact be seen as an endogenous indicator of degradation on par with or even outweighing ecologically measurable phenomena. In other words, the etic concern for degradation is incorporated into the endogenous knowledge space that surrounds the creation of land degradation policies and programmes.

Ingold has argued that ‘knowledge of the world is gained by moving about in it, exploring it, attending to it, ever alert to the signs by which it is revealed’ (2000, 55). In SKL, the direct farmer engagement with policy practices that are unmistakably named degradation prevention or regeneration substantiates land-use change into palpable improvement and thus is part of the endogenous understanding of land dynamics. Meanwhile in DGY, the figurative notion of land degradation fails to overlap with the literal and lived knowledge experience and practice (Scott 1989, 206), and ecological improvements remain distant and imperceptible.

The conceptualization of environmental perceptions as constructed through interactions between humans and their surroundings (Bonnes and Bonaiuto 2002) provides an explanatory mechanism for how the paradoxical differences between DGY and SKL emerged. Credibility theory and the conceptualization of knowledge interactions as endogenous to institution creation, rather than mere contradictions between emic and etic knowledge systems, offers a conceptual framework for understanding that a forced attempt to privatize grasslands in Inner Mongolia and land use restrictions in DGY failed to establish credible institutions, whereas a more engaging approach has generated the credibility for the proposed land management and a perception of ecological improvement in SKL. Such a conceptualization of emic and etic interactions entails an explicit acknowledgement of epistemic diversity, but also acknowledges the mutual adaptability and political construction of both. As per Agrawal’s suggestion, the ‘sterile dichotomy between indigenous and scientific knowledge’ is abandoned, opening a space for potentially productive dialogue that ‘focuses on safeguarding the interests of those who are disadvantaged’ (1995, 418).

Thus, if whoever is in charge of the thankless task of institution-making is indeed concerned with ensuring credibility, then they must consider the pre-existing local circumstances. Of course, such consideration by default is a step back from the unequal power relationship that brings about non-credible institutions in the first place. Instead, the other players are empowered. From this perspective, the institutional credibility thesis offers an opportunity to organically assert the importance of local forms of knowledge and re-shape discussions about management of natural resources.

### **Acknowledgement**

The authors would like to express their thanks to the anonymous reviewers of this journal for their helpful and constructive comments.

### **Disclosure statement**

No potential conflict of interest was reported by the author.

### **Funding**

This work was supported by National Natural Science Foundation of China (NSFC) [grant number 71473286].

### **References**

- Adriansen, H.K. 2005. Reports and short notices pastoral mobility: A review. *Nomadic Peoples* 9, no. 1&2: 207–14.
- Agrawal, A. 1995. Indigenous and scientific knowledge: Some critical comments. *Development and Change* 26, no. 3: 413–39.

- Agrawal, A. 2005. Environmentality: Community, intimate government, and the making of environmental subjects in Kumaon, India. *Current Anthropology* 46, no. 2: 161–90.
- Banks, T. 2001. Property rights and the environment in pastoral China: Evidence from the field. *Development and Change* 32, no. 4: 717–40.
- Baranovitch, N. 2016. The 2011 protests in Inner Mongolia: An ethno-environmental perspective. *The China Quarterly* 225(March): 214–33.
- Berkes, F. 2012. *Sacred ecology*. 3rd ed. New York: Routledge.
- Bernard, H.R. 2006. *Research methods in anthropology: Qualitative and quantitative approaches*. Oxford: AltaMira Press.
- Bonnes, M., and M. Bonaiuto. 2002. Environmental psychology: From spatial-physical environment to sustainable development. In *Handbook of environmental psychology*, ed. R.B. Bechtel and A. Churchman, 28–54. New York: John Wiley & Sons, Inc.
- Borgatti, S.P. 1994. Cultural domain analysis. *Journal of Quantitative Anthropology* 4: 261–78.
- Brook, R.K., and S.M. McLachlan. 2005. On using expert-based science to ‘test’ local ecological knowledge. *Ecology and Society* 10, no. 2: r3.
- Campbell, B.M., I.J. Gordon, M.K. Luckert, L. Petheram, and S. Vetter. 2006. In search of optimal stocking regimes in semi-arid grazing lands: One size does not fit all. *Ecological Economics* 60, no. 1: 75–85.
- Christensen, L., S. BurnSilver, and M. Coughenour. 2005. Integrated assessment of the dynamics, stability and resilience of the Inner Mongolian grazing ecosystems. *Nomadic Peoples* 9, no. 1: 131–45.
- Conte, T.J. and B. Tilt. 2014. The effects of China’s grassland contract policy on pastoralists’ attitudes towards cooperation in an Inner Mongolian banner. *Human Ecology* 42, no. 6: 837–46.
- Derry, J.F. and R.B. Boone. 2010. Grazing systems are a result of equilibrium and non-equilibrium dynamics. *Journal of Arid Environments* 74, no. 2: 307–9.
- Ding, C. 2003. Land policy reform in China: Assessment and prospects. *Land Use Policy* 20, no. 2: 109–20.
- Dixon, A.D. 2012. Function before form: Macro-institutional comparison and the geography of finance. *Journal of Economic Geography* 12, no. 3: 579–600.
- Dong, S.K., H.W. Gao, G.C. Xu, X.Y. Hou, R.J. Long, M.Y. Kang, and J.P. Lassoie. 2007. Farmer and professional attitudes to the large-scale ban on livestock grazing of grasslands in China. *Environmental Conservation* 34, no. 3: 246–54.
- Fernandez-Gimenez, M.E. 2000. The role of Mongolian nomadic pastoralists’ ecological knowledge in rangeland management. *Ecological Applications* 10, no. 5: 1318–26.
- Fernandez-Gimenez, M.E. 2002. Spatial and social boundaries and the paradox of pastoral land tenure: A case study from postsocialist Mongolia. *Human Ecology* 30, no. 1: 49–78.
- Fernandez-Gimenez, M.E. 2010. Sustaining the steppes: A geographical history of pastoral land use in Mongolia. *Geographical Review* 89, no. 3: 315–42.
- Gratani, M., J.R.A. Butler, F. Royce, P. Valentine, and D. Burrows. 2011. Is validation of indigenous ecological knowledge a disrespectful process? A case study of traditional fishing poisons and invasive fish management from the wet tropics, Australia. *Ecology and Society* 16, no. 3: art25.
- Grossman, P. and R. Devisch. 2002. Endogenous knowledge in anthropological perspective. In *Indigenous knowledge and the integration of knowledge systems: Towards a philosophy of articulation*, ed. C.A.O. Hoppers, 96–127. Claremont: New Africa Books.
- Harris, M. 1976. History and significance of the EMIC/ETIC distinction. *Annual Review of Anthropology* 5, no. 1: 329–50.
- Ho, P. 2000. The myth of desertification at China’s northwestern frontier: The case of Ningxia province, 1929–1958. *Modern China* 26, no. 3: 348–95.
- Ho, P. 2001. Who owns China’s land? Policies, property rights and deliberate institutional ambiguity. *The China Quarterly* 166: 394–421.
- Ho, P. 2005. *Institutions in transition: Land ownership, property rights, and social conflict in China*. Oxford: OUP.
- Ho, P. 2014. The ‘credibility thesis’ and its application to property rights: (In)secure land tenure and social welfare in China. *Land Use Policy* 40(September): 1–35.
- Ho, P. 2016. Empty institutions, non-credibility and power: China’s grazing ban and mining politics. *Journal of Peasant Studies* 43, no. 6.
- Ho, P. and H. Azadi. 2010. Rangeland degradation in North China: Perceptions of pastoralists. *Environmental research* 110, no. 3: 302–7.

- Ho, S.P.S. and G. Lin. 2003. Emerging land markets in rural and urban China: Policies and practices. *The China Quarterly* 175: 681–707.
- Hunn, E. 2007. Ethnobiology in four phases. *Journal of Ethnobiology* 27, no. 1: 1–10.
- Ingold, T. 2000. *The perception of the environment: Essays on livelihood, dwelling and skill*. London: Routledge.
- Kram, M., C. Bedford, M. Durnin, Y. Luo, K. Rokpelnis, B. Roth, N. Smith, Y. Wang, G. Yu, Q. Yu, and X. Zhao. 2012. *Protecting China's biodiversity: A guide to land use, land tenure & land protection tools*. Beijing: The Nature Conservancy.
- Kung, J.K. 2000. Common property rights and land reallocations in rural China: Evidence from a village survey. *World Development* 28, no. 4: 701–19.
- Lattimore, O. 1947. Inner Asian frontiers: Chinese and Russian margins of expansion. *The Journal of Economic History* 7, no. 1: 24–52.
- Lévi-Strauss, C. 1966. *The savage mind*. Chicago: University of Chicago Press.
- Li, W. and L. Huntsinger. 2011. China's grassland contract policy and its impacts on herder ability to benefit in Inner Mongolia: Tragic feedbacks. *Ecology and Society* 16, no. 2: art1.
- Li, J., X. Yang, Y. Jin, Z. Yang, W. Huang, L. Zhao, T. Gao, H. Yu, H. Ma, Z. Qin, and B. Xu. 2013. Monitoring and analysis of grassland desertification dynamics using Landsat images in Ningxia, China. *Remote Sensing of Environment* 138: 19–26.
- Menghewuliji. 2013. *Sandy land environment and nomadic ecological knowledge* [Shā dì huán jìng yǔ yóu mù shēng tài zhī shi]. Beijing: Intellectual Property Publishing House.
- Mitchell, D.J., M. a. Fullen, I.C. Trueman, and W. Fearnough. 1998. Sustainability of reclaimed desertified land in Ningxia, China. *Journal of Arid Environments* 39: 239–51.
- Molnár, Z. 2012. Classification of pasture habitats by Hungarian herders in a steppe landscape (Hungary). *Journal of Ethnobiology and Ethnomedicine* 8: 28.
- Nadasdy, P. 2003. Reevaluating the co-management success story. *Arctic* 56, no. 4: 367–80.
- Ningxia Hui Autonomous Region grazing prohibition ordinance [Níngxìà Huízú zìzhìqū jìn mù fēng yù tiáolì]. 2011.
- North, D.C. 1990. *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.
- Ong, L.H. 2014. State-led urbanization in China: Skyscrapers, land revenue and 'concentrated villages'. *The China Quarterly* 217(October): 162–79.
- Ostrom, E. 2009. *Understanding institutional diversity*. Princeton: Princeton University Press.
- Rappaport, R.A. 2000. *Pigs for the ancestors: Ritual in the ecology of a new Guinea people*. 2nd ed. Long Grove: Waveland Press.
- Reed, M.S. and A.J. Dougill. 2002. Participatory selection process for indicators of rangeland condition in the Kalahari. *The Geographical Journal* 168, no. 3: 224–34.
- Rodgers, J.L. 1991. Matrix and stimulus sample sizes in the weighted MDS model: Empirical metric recovery functions. *Applied Psychological Measurement* 15, no. 1: 71–7.
- Scott, C. 1989. Knowledge construction among the Cree hunters: Metaphors and literal understanding. *Journal de la Société des Américanistes* 75: 193–208.
- Scott, J.C. 1998. *Seeing like a state: How certain schemes to improve the human condition have failed*. New Haven: Yale University Press.
- Sneath, D. 2001. Notions of rights over land and the history of Mongolian pastoralism. *Inner Asia* 3, no. 1: 41–58.
- Sturrock, K. and J. Rocha. 2000. A multidimensional scaling stress evaluation table. *Field Methods* 12, no. 1: 49–60.
- Tang, R. and M.C. Gavin. 2015. Degradation and re-emergence of the commons: The impacts of government policies on traditional resource management institutions in China. *Environmental Science & Policy* 52: 89–98.
- Taylor, J. 2012. Constraints of grassland science, pastoral management and policy in Northern China: Anthropological perspectives on degradational narratives. *International Journal of Development Issues* 11, no. 3: 208–26.
- Thomas, D.S.G. and C. Twyman. 2004. Good or bad rangeland? Hybrid knowledge, science, and local understandings of vegetation dynamics in the Kalahari. *Land Degradation & Development* 15, no. 3: 215–31.
- Vetter, S. 2005. Rangelands at equilibrium and non-equilibrium: recent developments in the debate. *Journal of Arid Environments* 62, no. 2: 321–41.

- Wang, W. 2005. Strengthening legal protection of farmers' land rights [Jiāqiáng nóngmín tǔdì quánlì de fǎlǜ bǎozhàng]. *People's Daily*, November 24. p. 11.
- Wang, Y. and Q. Wu. 2012. An analysis of the effectiveness of privatisation and property rights clarification for alleviation of grassland degradation [Sīyòuhuà hé chǎnquán míngxī duì huǎnjiě cǎochǎng tuìhuà de xiàoguǒ fēnxī]. *Money China* 10: 155–6.
- Williams, D.M. 2002. *Beyond great walls: Environment, identity, and development on the Chinese grasslands of Inner Mongolia*. Stanford: Stanford University Press.
- Wu, Z. 2012. *Report on state of implementation of Ningxia 'Twelfth Five-year Guidelines' Central and Southern Region ecological migration plan* [Guānyú shíshī Níngxià 'shí'èrwǔ' zhōng nánbù dìqū shēngtài yímín guīhuà qíngkuàng de bàogào].
- Xie, Y. and W. Li. 2008. Why do herders insist on otor? Maintaining mobility in Inner Mongolia. *Nomadic Peoples* 12, no. 2: 35–52.
- Yang, L. and J. Wu. 2012. Knowledge-driven institutional change: An empirical study on combating desertification in northern China from 1949 to 2004. *Journal of Environmental Management* 110: 254–66.
- Yang, X., R. Zhao, and S. Yue. 2008. Thoughts on the relations of rural land – based on the 3rd rural household survey of Shandong from 1995–2008 [Nóngcūn tǔdì guānxi sīkǎo——jīyú 1995~2008 nián sāncì Shāndōng nóngghù diàochá]. *Guǎn lǐ shì jiè* 7: 53–61.
- Yeh, E.T. 2005. Green governmentality and pastoralism in western China: 'Converting pastures to grasslands'. *Nomadic Peoples* 9, no. 1&2: 9–30.
- Yeh, E.T. 2009. Greening western China: A critical view. *Geoforum* 40, no. 5: 884–94.
- Zhang, X.Q. 1997. Urban land reform in China. *Land Use Policy* 14, no. 3: 187–99.
- Zhang, Q.F. and J.A. Donaldson. 2013. China's agrarian reform and the privatization of land: A contrarian view. *Journal of Contemporary China* 22, no. 80: 255–72.
- Zhou, Z. 2013. A view of Ningxia ten years since the grazing ban [Jīn mù yī nián kàn Níngxià]. *People's Daily*, June 29. p. 10.

**Heng Zhao** is a full professor of biodiversity and environment at Minzu University of China, Beijing. After she obtained her PhD from the Chinese Academy of Sciences in 1996, she worked at the universities of Amsterdam and Wageningen in The Netherlands for over 10 years. Prior to her current professorship, she was a full professor at the Chinese Academy of Agricultural Sciences, Beijing and full professor at the China Agricultural University. Prof. Zhao has published over 40 articles indexed by the Social Sciences Citation Index or the Science Citation Index on issues of genetic modification, biodiversity and environmental biology, with particular reference to natural resource aspects and biosafety, in journals with impact factors up to 5.8. She has conducted numerous projects funded, amongst others, by the High-talent Fellowship of the Chinese Ministry of Education, Chinese National Key Fundamental Science, the State High Technology Foundation, the Dutch Ministry of Economic Affairs, The Netherlands North–South Fund and the European Union. Email: zhaoz5755@gmail.com

**Karlis Rokpelnis** is a PhD candidate in ethnoecology at the Minzu University of China where he conducts research on knowledge and perception of land degradation in the drylands of northwest China, especially Ningxia Autonomous Region. Karlis has taught college-level mobile-learning courses such as 'Ethnic Studies in Tibet' and 'Environmental Issues in Yunnan' for study-abroad programmes in Beijing and Kunming, and has led numerous educational tours throughout China. Along with his doctoral research, he has also conducted research on land rights issues in China for The Nature Conservancy. Karlis holds an MPhil in environmental policy from the University of Cambridge and a BA in Environmental Politics from Whitman College (cum laude). Originally from Latvia, Karlis has lived and travelled in indigenous areas in Canada, Russia, USA, Scandinavia and Australia, and has lived in China for most of the last decade.