上海师范大学
Shanghai Normal University

环境与地理科学学院
SCHOOL OF ENVIRONMENTAL AND GEOGRAPHICAL SCIENCES

EGU General Assembly
May 25, 2022

Causes of overgrazing in Inner Mongolian grasslands

-- Searching for deep leverage points of intervention

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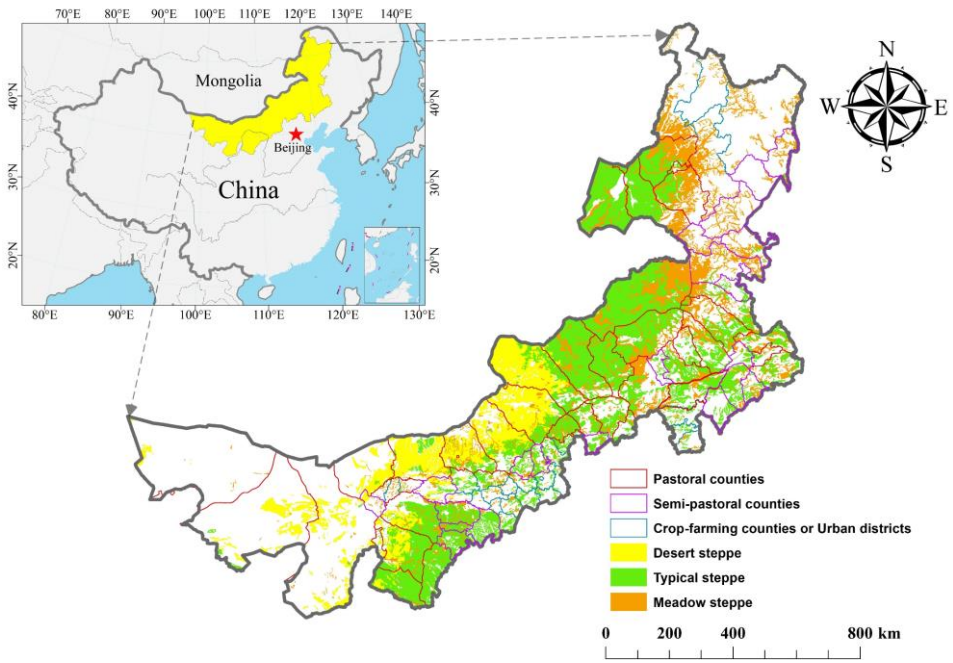
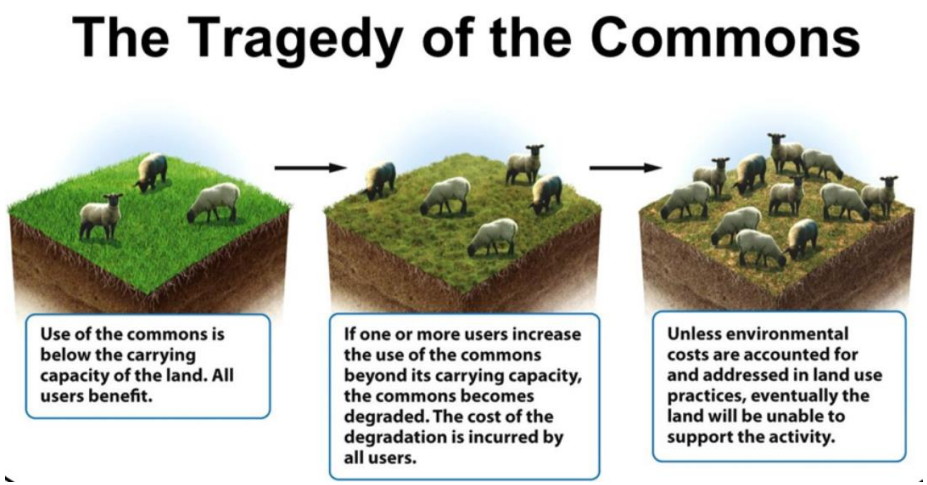
Overgrazing is a common problem in global drylands





- Overgrazing is the **main driver of grassland degradation** in the pastoral area of Inner Mongolia .
- The well-known "**tragedy of the commons**" assumes that, in a shared and unregulated grassland, individual herders tend to act independently according to their own interests, degrading the shared grassland.

Tragedy of privatization

- **Three strategies** have been proposed to avoid this tragedy**: coercive state involvement**, **privatization**, and **herder self-governance**.
- China chose to **private grassland property rights** in 1985 to promote herders' production incentives and protect grassland.
- **Grasslands continue to degrade**, and overgrazing are still the main cause.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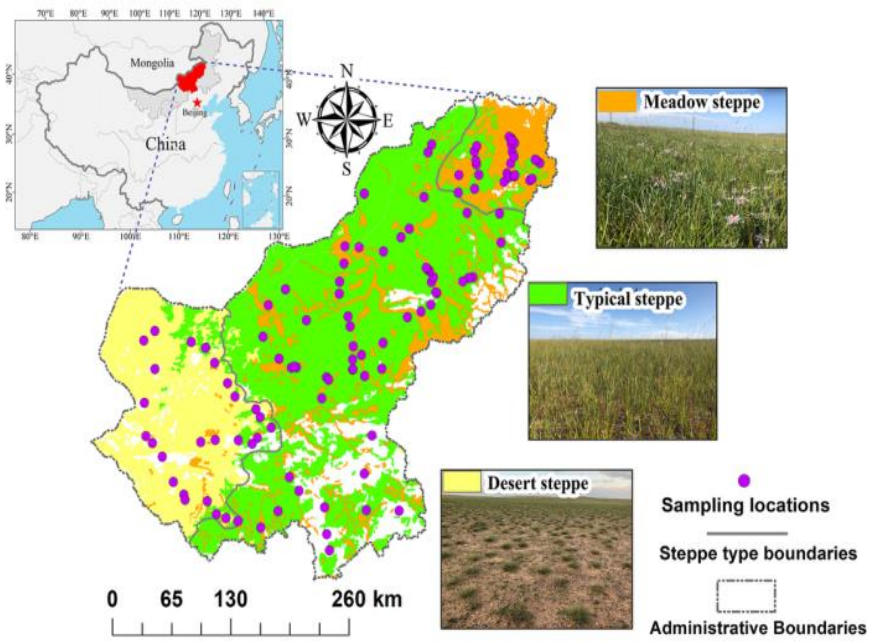
AGRICULTURE IN AN INTERCONNECTED WORLD

Tragedy of the commons or tragedy of privatisation? The impact of land tenure reform on grassland condition in Inner Mongolia, China

Min Liu[1], Liesbeth Dries[1], Wim Heijman[1], Jikun Huang[2], Xueqin Zhu[2], Xiangzheng Deng[2]

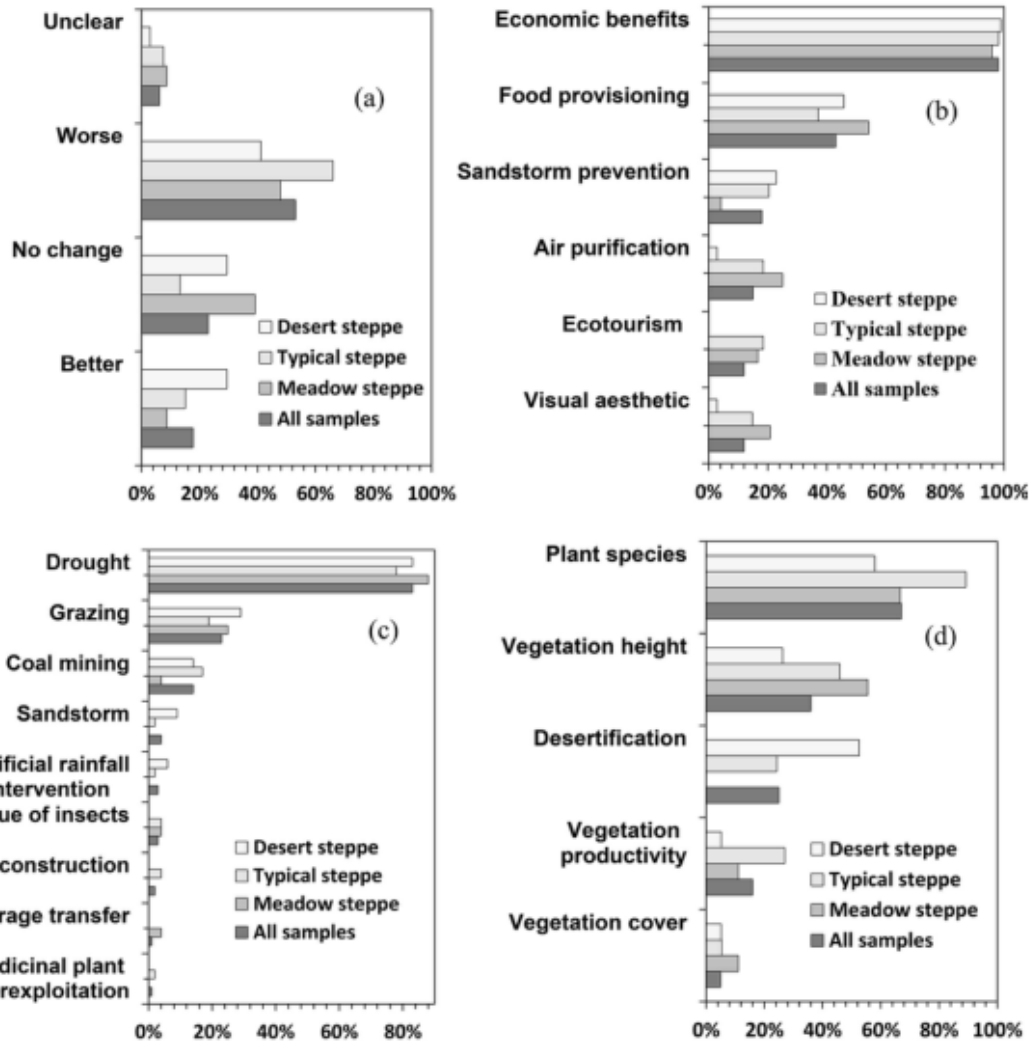
Research questions and methods

Fig. 1. Map of the study area and spatial distribution of grassland types with the locations of interviewed households. The photos of meadow steppe, typical steppe, and desert steppe were taken in Xilingol in August 2019.



- Why do herders not respond to grassland degradation by reducing stocking rates even after the grasslands are privatized?
- To test these hypotheses, we **interviewed 113 households** in Xilingol.
- We used **content analysis**, **descriptive statistics**, and **direct quotation** method to analyze the interviewed data.

Result 1: Herders' evaluation of grassland vegetation and ES



- The majority of herders believed that the **overall grassland vegetation had deteriorated** over the past 20 years (56.6%).
- The most **important benefit of grasslands** for the well-being of herders was the provision of **economic income** (98.23%), followed by food supply (43.36%).

Result 2: Herders' subjective evaluation of the state of HWB

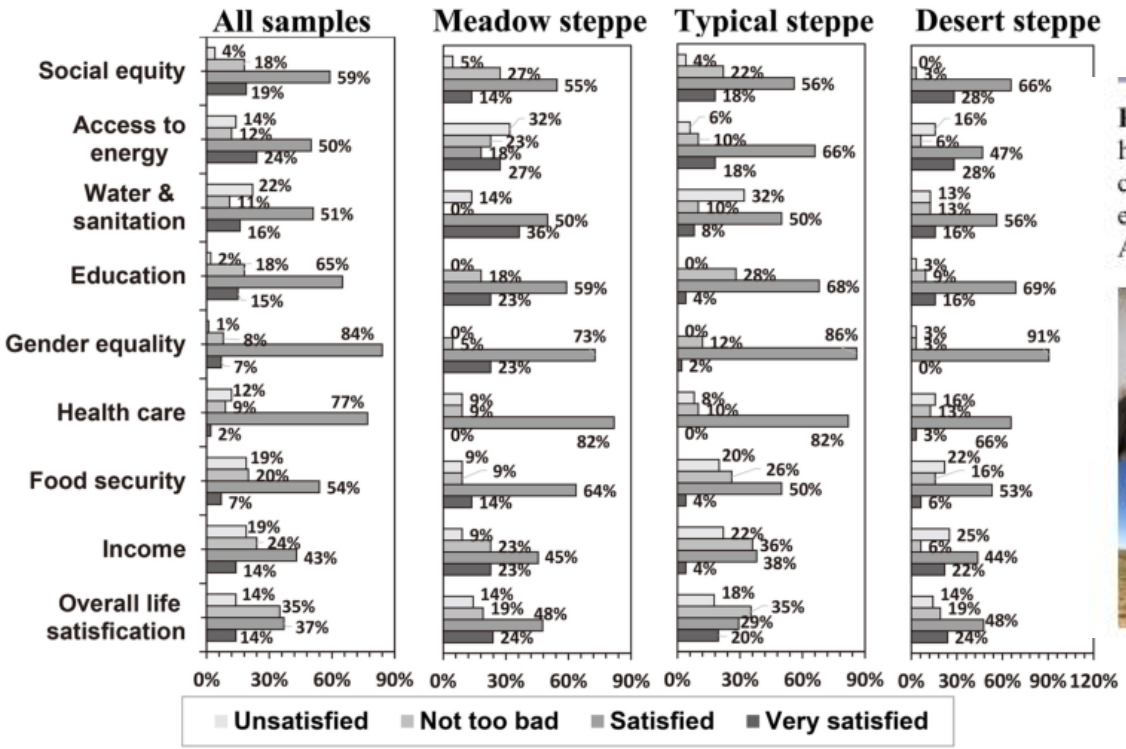


Fig. 5. The current status of the four well-being dimensions that herders were most unsatisfied with including poverty (a), concerns about the safety of vegetables and fruits (b), unstable energy supply (c, d), and shortage of safe drinking water (e, f). All the photos were taken in Xilingol in August 2019.

- Only 51% of herders are satisfied with their current quality of life, while **49% of herders are not satisfied with their quality of life.**
- By dimension, the dimensions of well-being that herders **are dissatisfied with** are **drinking water**, **economic income**, **food security** and **energy supply**, accounting for 22%, 19%, 19% and 14% respectively.

Result 3: Herders' understanding of causes of grassland degradation

Table 1. Herders' explanations for overgrazing.

Why do herders overstock even after recognizing its negative effects on grasslands?	Frequency (n=37)	Categories
The basic living expenditure (e.g., the expenditure on food, education, and traffic) increased rapidly.	65%	Increased economic pressures
The pressure of repaying loans.	16%	
Renting grasslands is very expensive, and the renters have to raise more livestock to make profits.	24%	Transaction of pasture property rights
The subsidies of pasture belong to pasture contractors, and the outcomes of overgrazing are borne by the renters.	22%	
Per capita pasture decreases with the increasing family size.	11%	Ineffective grassland policy
The Fencing Program leads to overgrazing.	11%	

- Overall, herders believe that the most important factor causing grassland degradation is **drought (94%)**.
- Less than 40% of herders considered **overgrazing to be the cause of grassland degradation**.
- Why do herders overgraze even though they know that overgrazing causes grassland degradation: (1) **pasture leaseholders** do not care for their pastures; (2) **the basic cost of living increases** and they cannot live without more; and (3) **grassland policy causes.**

Result 4: Factors determines herders' livestock management strategies

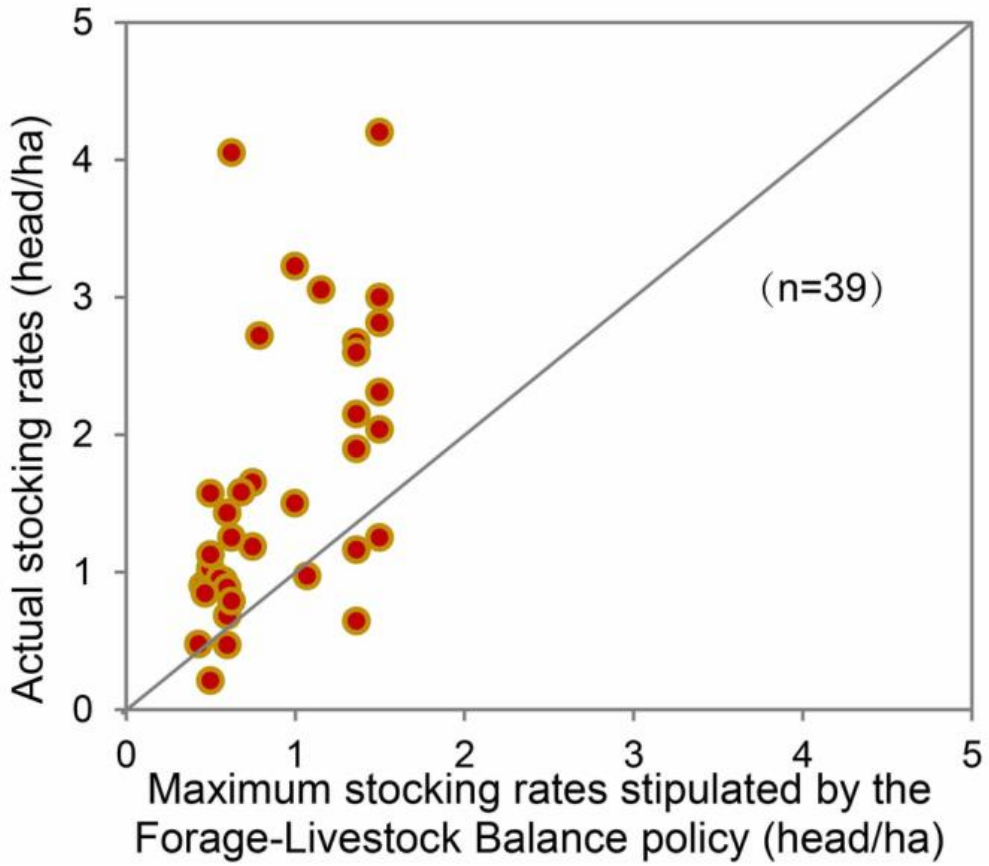
Table 2. Factors influencing herders' livestock management strategies.

How do herders decide the number of livestock to slaughter or stock each year?	Frequency (n=88)	Categories
A larger pasture area can support more livestock.	87%	Pasture area
When a drought occurs, herders first try to buy forages or rent grasslands, but they will slaughter some ewes if lacking funds.	70%	Drought
Declining labor capacity due to aging or diseases leads to lower livestock numbers and more pasture leasing.	27%	Workforces
Reduced workers in pastoral areas due to urbanization leads to lower livestock numbers and more pasture leasing.		
With more savings, herders can rent more grasslands and support a larger number of livestock.	27%	Deposit amount
With more savings, herders can cope with droughts better by purchasing forages or renting grasslands.		
If a loan is available, herders can purchase more supplementary forages to support a larger number of livestock.	19%	Loan availability
If a loan is available, herders can cope with droughts by purchasing forages or renting grasslands.		
When the livestock price is low, the poor herders have to slaughter more livestock to make a living or pay off the loan.	15%	Livestock price
When the livestock price is low, the rich herders choose to reserve more lambs to replace old ewes.		

- Six factors affecting herders' livestock stocking decisions were identified: **pasture area**, **drought**, **labor capacity**, **amount of savings**, **loan availability**, and **livestock prices**.
- The most frequently mentioned factors were **pasture area** (88%) and **drought** (70%).

Result 5: Herders' views on current grassland ecological policies

Fig. 6. A comparison between the actual stocking rate and the maximum stocking rate stipulated by the Forage-Livestock Balance Policy.



The reasons for the **unreasonable grass-livestock balance policy** are:

(1) the **maximum livestock carrying capacity** specified in the policy is not in line with the actual local situation;

(2) if the grass-livestock balance policy is strictly adhered to, **livelihoods cannot be maintained**;

(3) the **policy is completely unnecessary** because herders love their pastures and will adjust themselves according to the weather conditions.

Conclusions

In sum, overgrazing in the Xilingol grassland region is a complex problem caused by a combination of factors including:

(1) herders' strong aspiration to **improve their quality of life**,

(2) faulty grassland **leasing policies**,

(3) **decoupling** of herders' well-being from grassland conditions,

(4) **herders' misperceptions** about the causes of grassland degradation, and

(5) **inappropriate strategies** for coping with precipitation fluctuations.

Implications

Table 4. Potential leverage points for intervention in the Inner Mongolia grazing system, using typologies from Meadows (1999) and Abson et al. (2017).

Leverage type		Leverage points in the Inner Mongolia grazing systems
Shallow leverage points	Parameters	To set the maximum allowed stocking rates.
	Feedbacks	To reconnect the long-term health of rented grasslands with herders' livelihoods.
Deep leverage points	Design	To improve the grassland governance system by integrating top-down policy and herder self-governance. To get herders involved in developing holistic livestock management strategies that are both economically profitable and ecologically sustainable.
	Intent	To reduce poverty and inequity.

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Thank you!
Questions?