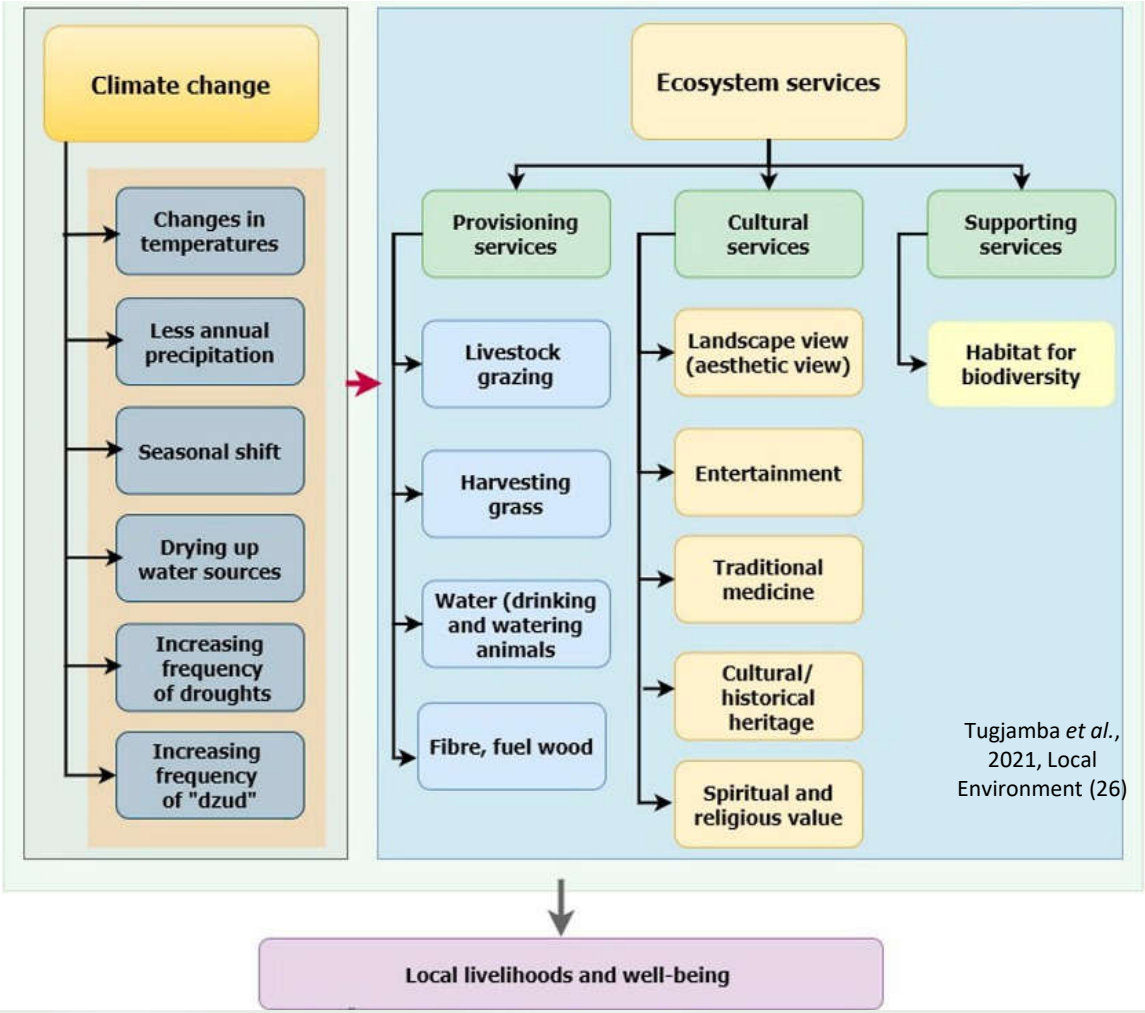
Climate Change Vulnerability Assessment of Livestock Farming Systems in Bayantümen *Soum*

Majid Iravani

Alberta Biodiversity Monitoring Institute, University of Alberta, iravani@ualberta.ca

Why Care about Climate Change?

Climate Change is a social, economic and environmental issue!



Tugjamba *et al.*, 2021, Local Environment (26)

It has implications at a local level in terms of impacts on environmental goods & services and herders' well-being!

Why Climate Change Vulnerability Assessment?

- What if change is coming, but local herders are uncertain of the severity!
- What if policy makers are not ready or don't have the capacity to deal with it!

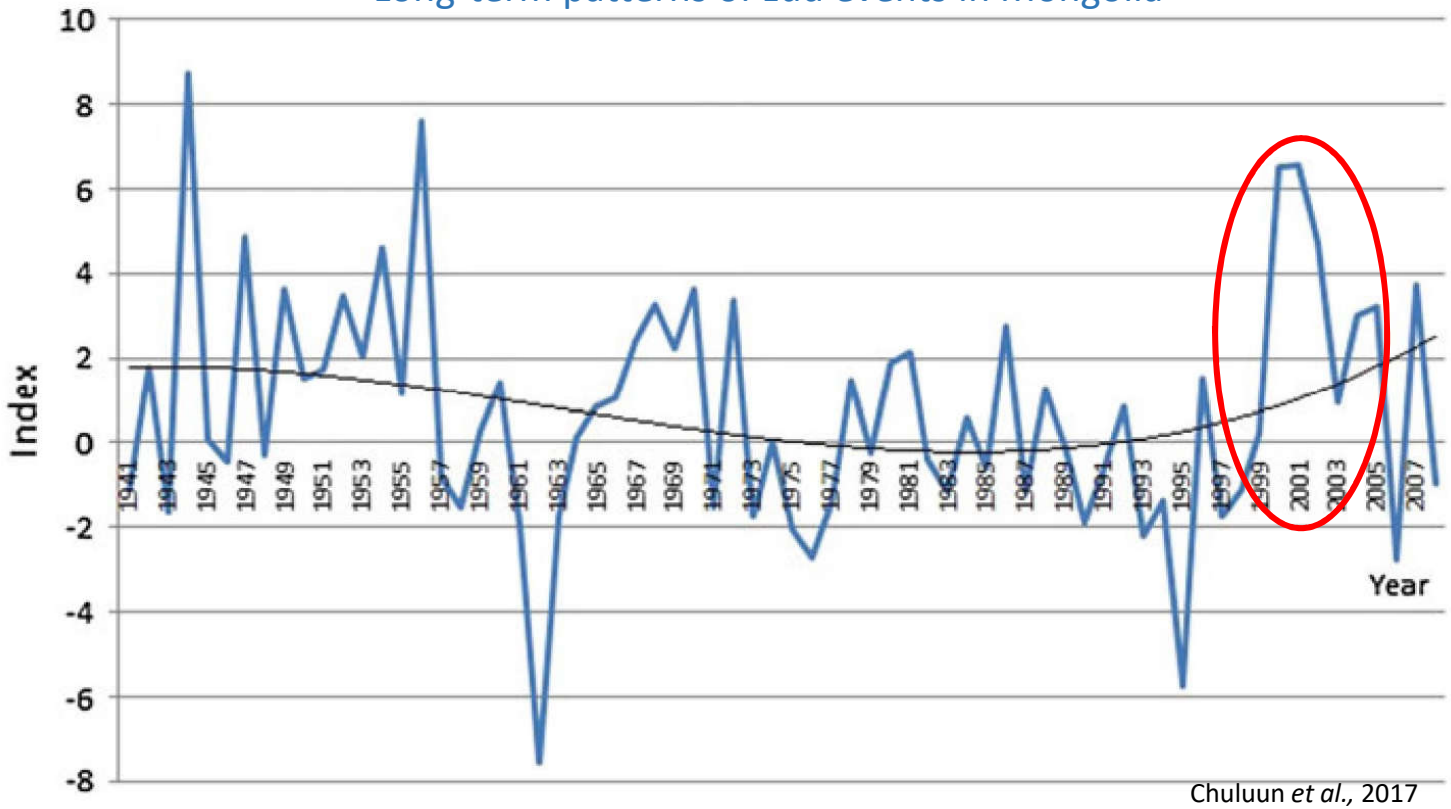
Acting sooner would be less disruptive than acting later!

Addressing climate change wisely will yield benefits to the economy and the quality of the life of herders.

Climate Change or Long-Term Climate Variability?

- Temperature increased by more than 2°C from 1940 to 2014.
- Precipitation reduced (but unevenly), in particular, over summer months.
- Water shortages for plant growth and livestock production increased.
- Frequency of extreme weather phenomena has doubled in the last two decades.

Long-term patterns of zud events in Mongolia



Chuluun *et al.,* 2017

Why Local Herders' Engagement?

Herder observed/perceived impacts of recent local climate change and variability.

An essential first step to enhancing the resilience of herders to climate change risks!

- A more robust information on local climate changes in such data-spare regions.
- A more complete picture of the vulnerability of local pastoral livelihood systems.
- A better understanding of the anticipated adaptation measures by local herders.

Survey of Local Herding Communities

Gender-responsive/socially inclusive survey, group discussions and workshops.

Direct interviews in June: 109 herder household members

Characteristic	Category and Percentage (%) out of 109
Gender	Female: 51.4%; Male: 48.6%
Age (yr)	15-25: 5.5%; 26-35: 22.9%; 36-45: 22.9%; 46-60: 26.7%; >60: 22%
Marital status	Unmarried: 17%; Married: 83%
Education	Primary: 50%; Secondary: 30%; Post-secondary: 20%
Household size	1-3: 38%; 3-5: 40%; >5: 22%
Herding history (yr)	<10: 31.2%; 10-20: 22%; > 20: 46.8%
Total livestock herded	<300: 40%; 300-500: 20%; >500: 40%
Income from livestock	<50%: 24%; 50-75%: 20%; >75%: 56%

Vulnerability and Risks from Climate Change

local herding communities and their livestock farming systems

Gender-responsive

Socially-inclusive

Exposure

Amount and rate of climate change experienced

Sensitivity

Level of concern and sensitivity to climate change impacts

Adaptive Capacity

Existing capacity and ability to adapt to climate, and major barriers limiting their adaptive capacity

Consultation with local experts


Climate change is one of the main challenges herders have faced in recent years (80%) and expect to face more in the future (72%).

Herders' Observations of RCENT Climate Change

- Relatively less snowfall/ snow cover.
- Cooler, windier, drier and slower spring and early growing season.
- Drier summer months and more intense and frequent droughts.

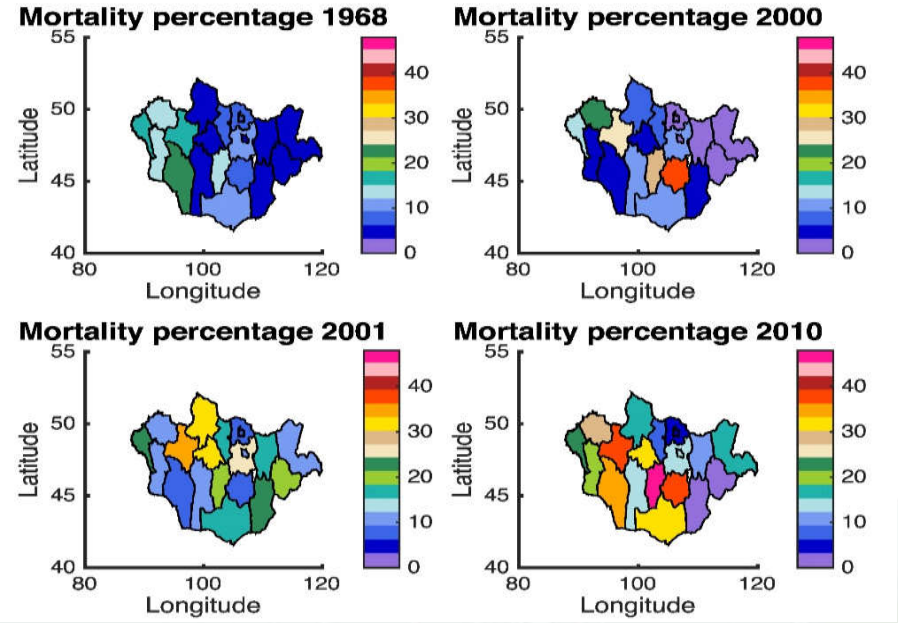
Future Projections of Climate Change (other studies)

- Increases in temperature across all four seasons (on average, 1.3 °C).
- Decrease in precipitation (10-20%) during summer season (June-August).

Herder's Concern and Sensitivity to Climate Change

- Delays in spring and early summer rain or relatively drier growing season.
- Severe water supply shortage for plant growth and productivity.
- Pasture forage productivity, and supply of livestock feed and fodder.
- Livestock access to food and water over harsh summers and winters.
- Livestock mortality and health issues.

Livestock mortality in major harsh winters

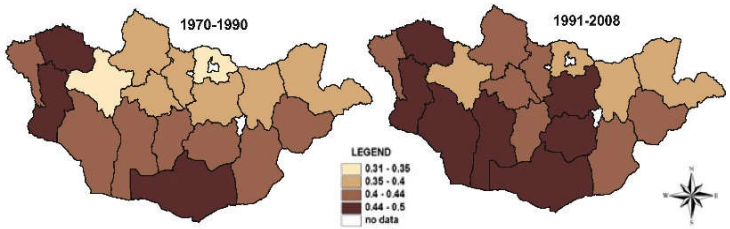


Palat Rao *et al.,* 2015, Environ. Res. Lett. (10)

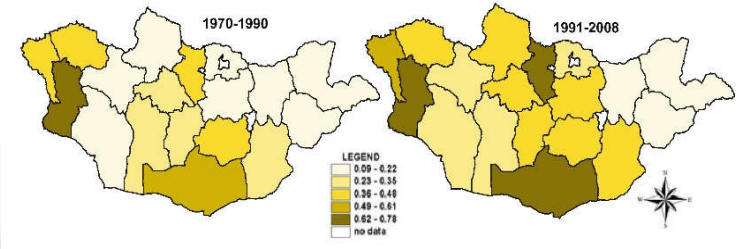
Environmental Issues Intensified by Climate Change

- Increase in livestock herd size and change in livestock herd mixture.
- Reduction in livestock movements or herders' immobility.
- Migration of unregistered livestock into the area.
- Increase in grazing pressure, particularly around water bodies.
- Degradation of steppe vegetation and soil.
- More intense wind and sand storms.

Increase in drought events



Increase in grazing pressure change



Chuluun *et al.,* 2017

Barriers Limiting Herders' Adaptive Capacity to Climate Change

- Lack of practical knowledge and adaptation technology.
- Limited operational capacity such as labor shortage.
- Limited financial capacity or incapacity.
- Lack of high-level policies for effective seasonal movements

Key Message!

As climate change progresses, herder communities and local organizations must work together to make decisions encouraging adaptation and promoting resiliency to their new climate and environmental conditions.

Conclusions & Next Step!

- Herders must play a fundamental role in finding appropriate adaptation pathways to cope with the joint effects of increasing grazing pressure and climate changes.
- Herders together with emerging community-based pasture management institutions must coordinate and contribute to systematic monitoring of their grazing landscapes.
- Local governments and financial institutions must implement high-level policies and other mechanisms that support local herders and pasture user groups to improve the health and productivity of grazing landscapes.

While acknowledging herders' long history of observing changes in their grazing lands and adapting to environmental change, this assessment sets the stage for communicating the expected climate change impacts and considering pasture management strategies and technologies that help herders maintain climate-resilience pastoral livelihood systems.

Swainson's Hawk
(*Buteo swainsoni*)

Picture: ABMI NatureLynx

Questions and feedback

Majid Iravani

Alberta Biodiversity Monitoring Institute

University of Alberta

E-mail: iravani@ualberta.ca

It's Our Nature *to Know*
Alberta Biodiversity Monitoring Institute