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NATURE RESEARCH



Mongolian rangelands - from biodiversity science to a social-ecological perspective

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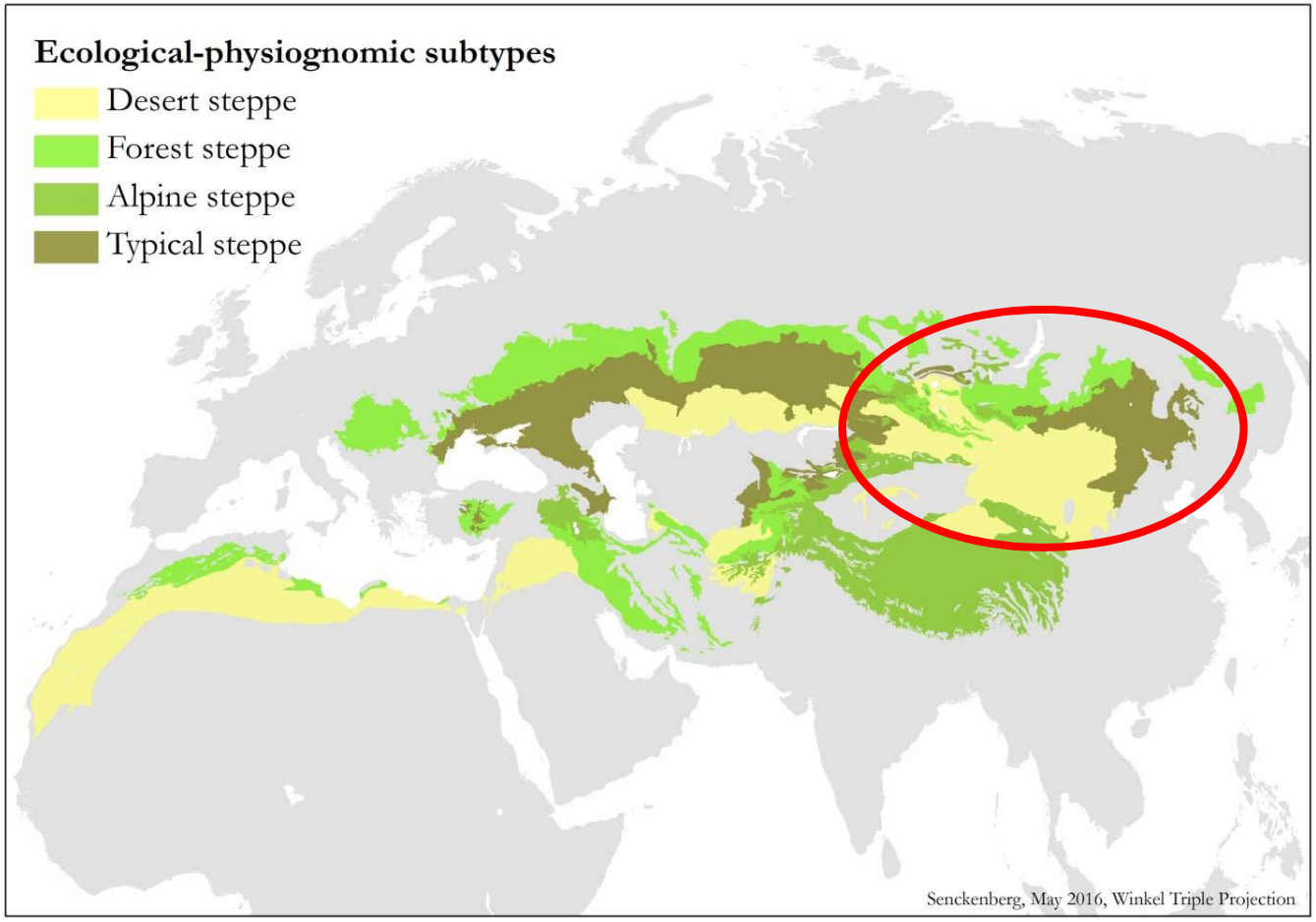
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Mongolia still hosts the world‘s finest steppes





Mongolia still hosts the world's finest steppes



➢ **Intact rangelands three times as large as Germany**

Wesche et al. *Biodiversity and Conservation* 2016

Mongolia still hosts the world‘s finest steppes – with unique ecosystems and unique biodiversity





Mongolia still hosts the world's finest steppes – with unique ecosystems and unique biodiversity





➢ **Global importance for species conservation**

Wesche et al. *Biodiversity and Conservation* 2016

Mongolia still hosts the world's finest steppes – with unique ecosystems and unique biodiversity and globally relevant ecosystems





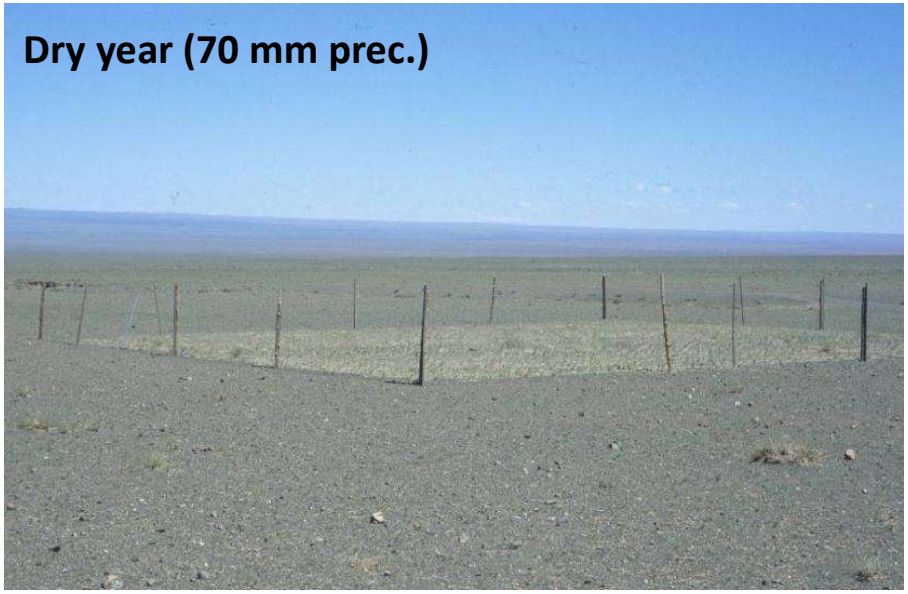


➢ **Ecosystem services and soil carbon storage**

Wesche et al. *Biodiversity and Conservation* 2016

Dryland ecosystems with highly variable rains





Mongolia‘s rains are low – and very variable

Wesche et al. *Acta Oecol.* 2010

Steppes are used as rangelands



Mobile livestock keeping



➢ **Pastoralism as response to climatic variability**

The Mongolian Ger as a mobile house



The Mongolian Ger as a mobile house



Milk products as stable food: Ayrag



➢ **Living in intimate connection with livestock**

Modern approaches to mobility



Testimonial for *Steppenwächter*, summer 2026

Land use change in steppes

Conversion severe in European region, and also Middle Asia, Mediterranean

Unit	Conversion		Rangeland degradation	
	Extent	Evidence	Extent	Evidence
European region	↔	WE	↔	WE
Middle Asian region	↔	WE	↔	EI
Mongolian region	↔	WE	↑	EI
Tibetan region	↔	WE	↑	IC
Mediterranean region	↓	EI	↓	IC

classes
low
moderate
high
very high

➢ **Mongolian steppes till good but threat increasing**

Wesche et al. *Biodiv Cons*. 2016, IPBES 2018

Challenges in future land use



Von Wehrden et al. *Ecol. Appl.* 2012

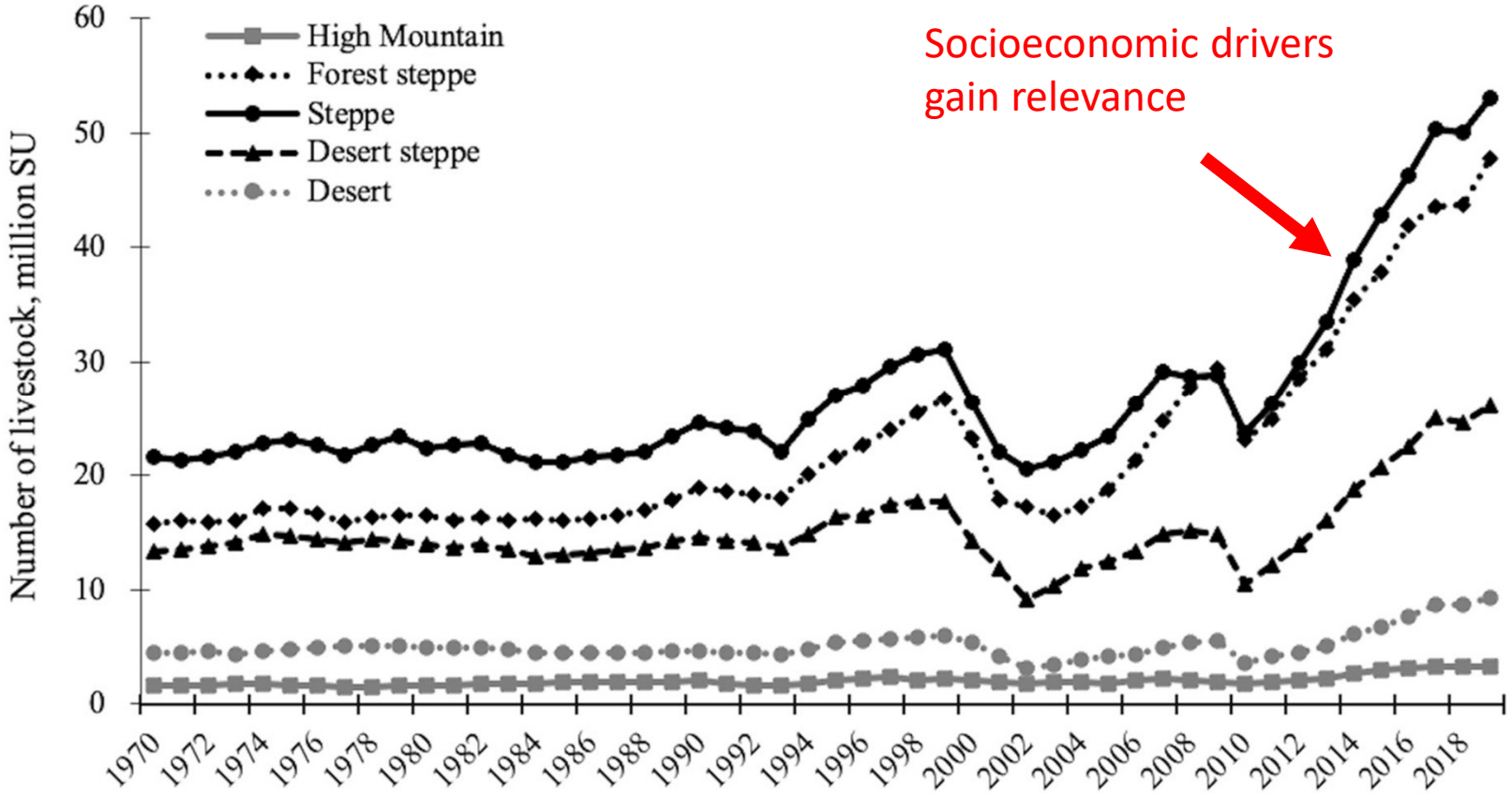
Large-scale exports of fossile fuels



➢ **Land use change: Mining**

Massive increases of herd sizes

Livestock units on a historical high since 2015



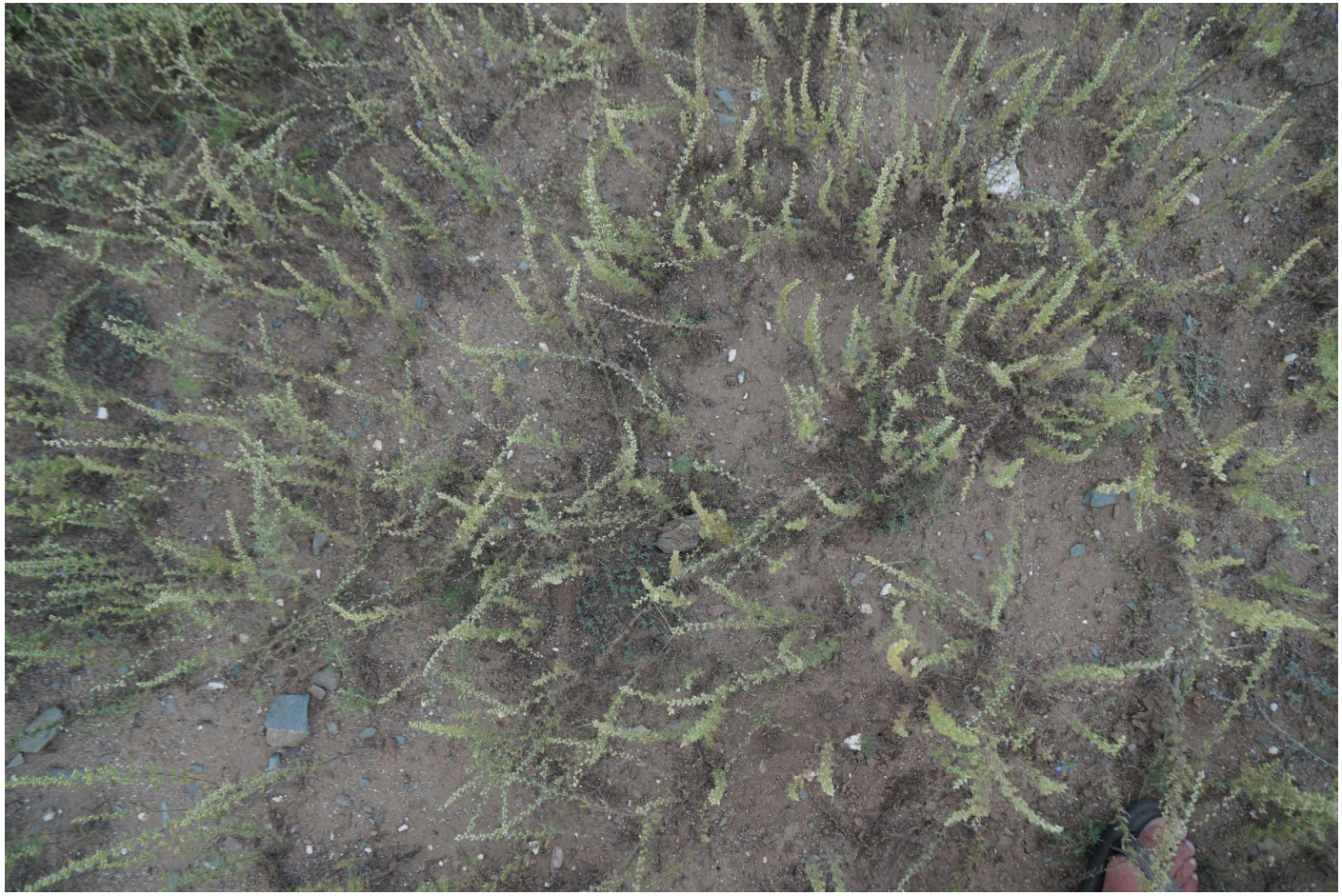
➢ **Land use change: Mining and intensified grazing**

Engler et al. *Ecol. Economics* 2021, Munkhzul et al *Front. Eco. Evol.* 2021

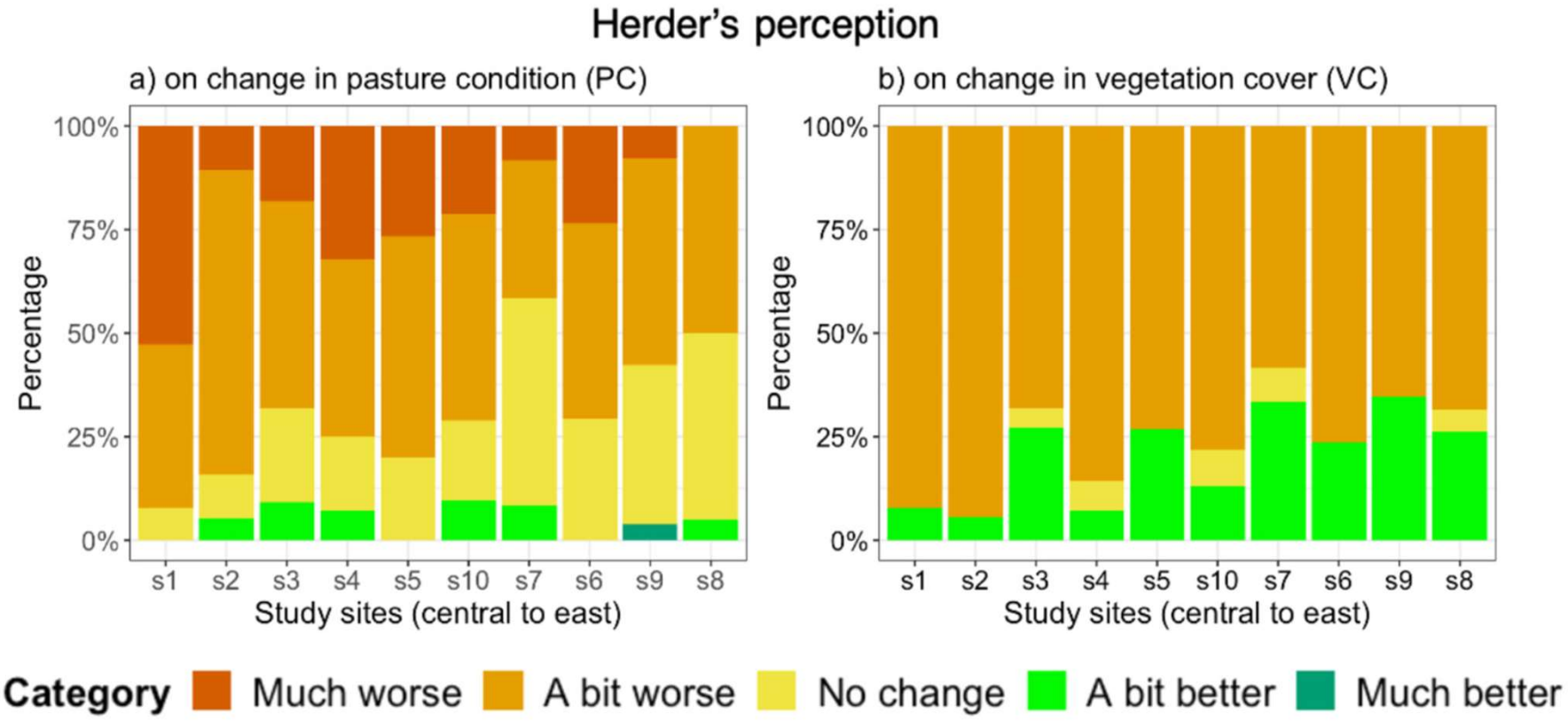
Soil erosion



Spread of unpalatable weeds



Herders differ widely in their assessments of pasture quality



- **Degradation: Erosion & vegetation replacement**
- **Loss of traditional ecological knowledge**

Oyundelger et al. *Biol. Cons*. 2026

Studying a social-ecological system



➢ **A biodiversity and people perspective is needed!**


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You for your attention .
Баярлалаа / Thank you / Vielen Dank