

Land-use transformations and conflicts among mining, pastoralism, and crop production in Mongolia: A perspective

Shahin Alam¹, Thanh Thi Nguyen¹, Nikolaus Schareika², Soninkhishig Nergui³, Ganzorig Gonchigsumlaa⁴, Munkhnasan Tsevegmed⁵, Otgonjargal Ayushjav⁶, Eva Schlecht⁷, Andreas Buerkert¹

¹Organic Plant Production and Agroecosystems Research in the Tropics and Subtropics, University of Kassel, Germany

²Institute of Social and Cultural Anthropology, University of Göttingen, Germany

³Department of Biology, School of Arts and Sciences, National University of Mongolia, Ulaanbaatar, Mongolia

⁴School of Economics and Business, Mongolian University of Life Sciences, Ulaanbaatar, Mongolia

⁵Ministry of Food, Agriculture, and Light Industry of Mongolia, Ulaanbaatar, Mongolia

⁶School of Animal Science & Biotechnology, Mongolian University of Life Sciences, Ulaanbaatar, Mongolia

⁷Animal Husbandry in the Tropics and Subtropics, University of Kassel and Georg-August-Universität Göttingen, Germany

Background

Land in Mongolia is increasingly contested among mining, pastoral livestock production, and crop cultivation, creating trade-offs between economic development, rural livelihoods, and environmental sustainability (Figure 1).

Despite their growing interactions, these different land uses are often studied separately, limiting understanding of their combined impacts on shared landscapes.



Figure 1. Gold mine site in Zaamar Soum, Mongolia

Aim: To understand the multidimensional land-use transformations, conflicts, and non-linear interactions among mining, pastoralism, and crop production by integrating literature, stakeholder perspectives, and vegetation dynamics in mined and non-mined areas.

Methodology



Literature review

- Articles, policy reports, and laws



Thematic synthesis

- Identification of conflicts & trade-offs



Stakeholder insights

- Exploration of broader/latest context



NDVI analysis

- Landsat 8 C2 L2, GEE, 2016-2025

Results

- Mining contributes 27% of GDP and supports employment and infrastructure development.
- Pastoralism and crops support rural livelihoods and cultural values.
- Competing land uses create conflicts over land, natural resources, and hamper livestock mobility (Figure 2).

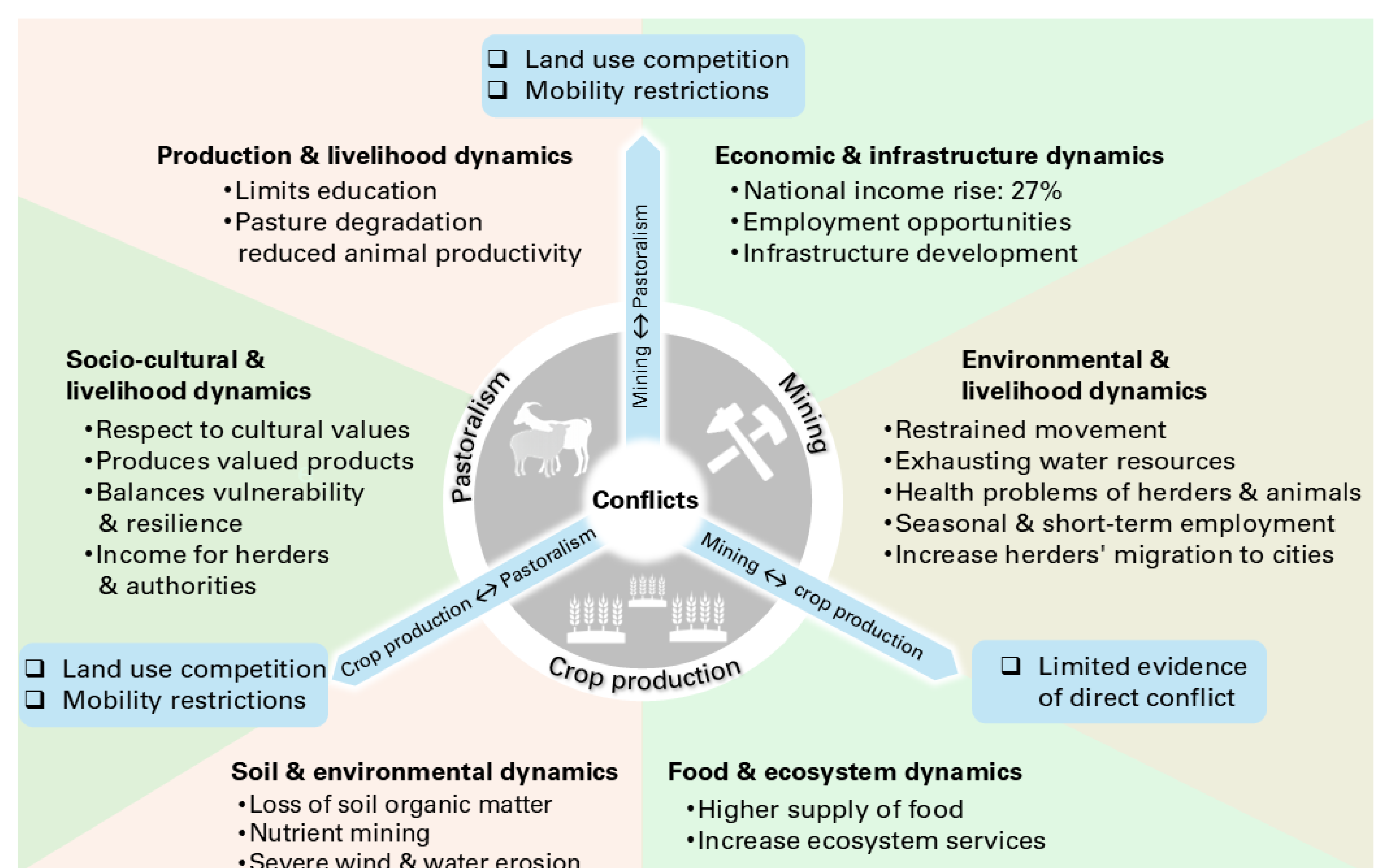


Figure 2. Land-use interactions, benefits, trade-offs, and conflicts in Mongolia

- Stakeholders highlighted environmental degradation, disrupted livestock mobility, health risks, and gaps in benefit-sharing and mine rehabilitation (Figure 3).
- NDVI declined sharply after mining (0.44 to 0.15) and only partially recovered after closure (0.28 vs. 0.51 in 2025).

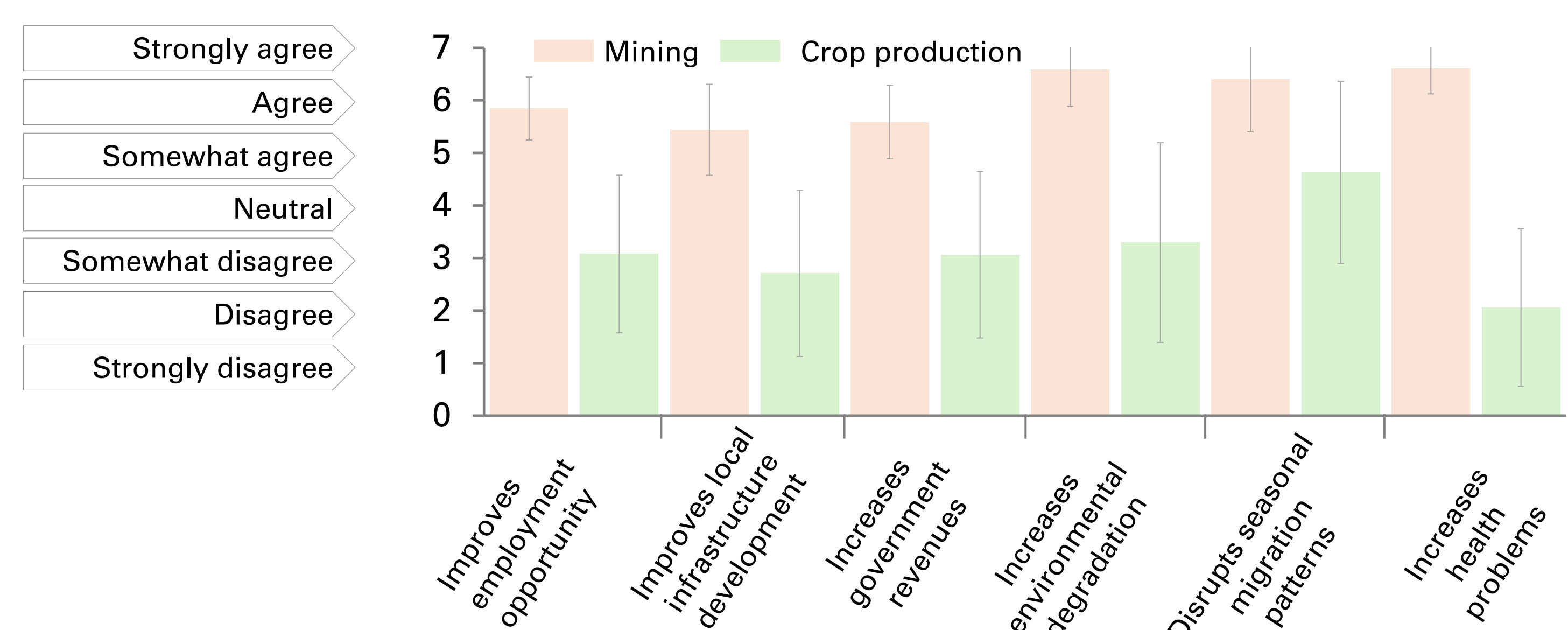


Figure 3. Perceived impacts of mining & crop production from exploratory fieldwork

Highlights

- Mining, pastoralism, and crop production shape Mongolia's ongoing land-use transformations and conflicts.
- Gaps persist between pre-mining planning and post-mining rehabilitation.
- Science-based future research is essential for the sustainable co-existence of mining, pastoralism, and crop production in Mongolia.



Contact

Dr. Shahin Alam
shahindps@uni-kassel.de



MINISTRY OF FOOD,
AGRICULTURE AND LIGHT INDUSTRY



Bundesministerium
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und Raumfahrt