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Stewards of the steppe: Khoid Mogoin Gol-Teel pastoral community institutions and their role in rangeland ecosystem conservation

Ulambayar, T[1]; Nergui, M[2]; Batkhuyag, B[3]; Davaasuren, O[4]

[1,2]Zoological Society Luujin; [3]WWF Mongolia; [4]Bayanbulag CBO, Bulgan, Arkhangai

Key words: community-based conservation; pastoral institutions; conservation outcomes; Mongolia

Abstract

Rangelands, covering over 50% of the Earth's terrestrial surface and providing essential ecosystem services, are experiencing severe degradation due to land conversion, overgrazing, invasive species and unsustainable land-management practices exacerbated by climate change. This degradation contributes to biodiversity loss, with habitat loss, resource decline, pollution and fragmentation posing serious threats to human society, including economic losses and food insecurity. This case study offers a positive perspective on Mongolian herders and their collaborative efforts to protect natural resources vital for their livelihoods and cultural identity. The Khoid Mogoin Gol-Teel Local Protected Area (KMGT LPA) in Central Mongolia, home to iconic species such as musk deer and snow leopards, supports over 400 herder households with 90,000 livestock (NSO 2023). Since Mongolia's transition to a market economy in the mid-1990s, the KMGT LPA has faced rangeland degradation and declines in wild species due to overgrazing and illegal activities. This study evaluates outcomes of initiatives of the Union of Conservation Communities (UCC) over the past five years, which have led to a significant increase in community engagement and participation, enhancing biodiversity conservation and improving herders' wellbeing. Specifically, participation in conservation training rose from 9% to 72%, and reports of illegal poaching and logging dropped to zero, highlighting the effectiveness of UCC efforts. These findings contribute important insights to the discourse on sustainable rangeland management and community-based conservation (CBC) strategies, supporting global efforts to achieve the Sustainable Development Goals and to promote ecosystem stewardship.

Introduction

Rangelands occupy nearly 70% of Mongolia's total area, directly supporting the livelihoods of almost 300,000 herders and over 64 million livestock (NSO 2023). Since Mongolia's transition to the market economy, with the collapse of state cooperatives and privatisation of livestock, the national herd has tripled in the past three decades (NSO 2023). This rapid growth has contributed to rangeland degradation, affecting 58% of the country's pastures (Densambuu et al. 2018) amidst intensifying climate change. In the absence of effective rangeland management institutions and because of weak governance over natural resources, Mongolia has witnessed a rise in illicit activities, including poaching, illegal logging and mining, which have depleted wild species and their habitats. Currently, only 21% of the country is under state protection, leaving vast rangeland ecosystems unprotected and heavily exploited, adversely impacting on Mongolia's natural capital. In this context, CBC could play a pivotal role in empowering herder stewardship to address the management gap and sustain ecosystem services vital to Mongolians. Since the introduction of CBC in the late 1990s, Mongolia has experienced varied outcomes, with positive results often failing to endure in the long term. This study aims to contribute to the broader research question of the key factors for successful CBC.

The KMGT LPA, located in Bulgan District of Arkhangai Province, covers 243,000 ha of mountain forest-steppe, with nearly 20% covered by forests (44,830 ha) that support rich biodiversity, including globally endangered species such as musk deer, saker falcon, steppe eagle, red deer and Mongolian marmot. The LPA's accessibility from the Arkhangai Province centre and the main road to the western region has led to challenges like illegal logging, poaching, forest fires and overgrazing. In response to these issues, the Bulgan District Government declared KMGT an LPA in 2017, and the Union of Conservation Communities (UCC) was established to unite the LPA herders with support from the Zoological Society of London (ZSL). This study aims to evaluate the initiatives undertaken by the UCC over the past five years, focusing on how these efforts have sought to address the dual challenges of rangeland degradation and decline in biodiversity. By assessing both the social and the ecological outcomes of UCC initiatives, the study will contribute to identifying the key factors that foster successful community-based governance and sustainable rangeland management, thereby enriching the discourse on effective strategies for conservation in Mongolia.

Methods

The study analysed data from two reports produced by researchers at the Independent Research Institute of Mongolia (IRIM) in 2019 and 2024, focused on assessing socio-economic surveys as well as separate biodiversity monitoring reports for three key species. The IRIM study employed a mixed-methods approach to assess social and ecological outcomes of KMGT LPA management. Research instruments included social surveys designed to capture herders' perceptions, alongside observations of natural resource conditions and changes, livelihoods (encompassing primary income and expenditures), housing, access to financial services, attitudes and participation in conservation initiatives. To evaluate herders' wellbeing, the study used the Multidimensional Poverty Index (MPI) (Alkire & Foster 2011), which integrates two critical components: the incidence of poverty, representing the proportion of individuals experiencing multiple deprivations, and the intensity of those deprivations. Ecological outcomes were measured through assessments of forest and rangeland conditions and the population status of key wildlife species. This involved the use of transects for musk deer monitoring, bird surveys and marmot counting, supplemented by herders' observations and reported sightings. For monitoring poaching and timber-logging activities, secondary data sources, including records of the Arkhangai Environment & Tourism Department (ETD), were also analysed.

Results

Social outcomes

The initiatives undertaken by the UCC have led to significant social outcomes within the KMGT LPA, enhancing community engagement, participation and governance structures among herders.

Community institutions established and governance process laid out. The baseline report indicated the existence of six registered Forest User Groups (FUGs), each comprising 6–7 member households; however, these groups were inactive because of a lack of leadership, organisation, collaboration, planning and financing (IRIM 2019). By 2024, the UCC had established 20 community-based organisations (CBOs) with membership ranging from 16 to 83 households (Yanjinpagma 2024). Each CBO is led by an elected leader and supported by two community rangers and a community-banking unit. The CBOs have defined territorial boundaries and signed management contracts with the District Authority, securing herders' tenure rights while clarifying their conservation responsibilities. Motivated by the successful management of the LPA, the District authority expanded the initial LPA area from 137,018 hectares to 242,887 ha in 2024, providing additional habitat for endangered species like the musk deer and increasing UCC membership to 592 herders. The UCC develops an annual management plan that incorporates individual CBO plans, which are discussed and reported at bi-annual UCC meetings. Each CBO also holds monthly community-banking meetings to facilitate loan disbursement and repayment among members and to discuss ongoing activities.

UCC member herders' access to information and participation increased. In 2018, only nine out of 28 FUG members reported participating in conservation initiatives, primarily focused on forest cleaning. By 2024, participation has significantly increased. The UCC, in partnership with organisations such as the Arkhangai ETD, the Ecological Police, the Zoological Society Luujin and the District Government Office, has provided

herders with briefings and training on local biodiversity, rangeland management, forest management, biodiversity monitoring and SMART (Spatial Monitoring And Reporting Tool) patrolling. According to the endline report, 72% of survey respondents participated in various training sessions, attending an average of seven meetings over the past three years. In addition, 61% engaged in planning and conservation actions, on an average of four times during the same period, and 42% of respondents were involved in monitoring activities, averaging four instances over three years. These learning opportunities have led to a positive shift in attitudes among herders, transforming them from poachers and illegal loggers into protectors of the LPA.

UCC members engaged in collective conservation actions. Thanks to a positive change in attitudes, UCC herders are now proactively involved in various conservation activities, including waste clean-up, forest thinning, fencing to protect young trees from grazing, safeguarding springs and conducting SMART patrols. These collective efforts have contributed to improved ecological outcomes. In 2018, surveys indicated prevalent illegal logging, cedar nut collection and marmot poaching, often without detection by law enforcement. Records from the Arkhangai ETD in 2024 revealed zero instances of poaching or illegal logging, with herders reporting no knowledge of such activities in their areas.

LPA women: housekeepers of CBO affairs. Women play a vital role in conservation and community-banking activities, particularly regarding organisational and logistical tasks. They have equal rights to run for leadership positions within CBOs and community banks and to access learning and development opportunities offered to UCC members. In addition to their essential herding and household responsibilities, women ensure high attendance at CBO meetings, prepare meals and appropriate clothing for annual activities such as forest cleaning and tree planting, and manage household chores, which allows men to engage in conservation efforts. Women lead about 10% of CBOs and 60% of community-banking groups; 90% of community banks have female secretaries and 50% have female accountants. Although more physically demanding tasks, such as forest cleaning, SMART patrolling and waste management, are predominantly undertaken by men, women are indispensable in governance-related functions, including financial management, meeting documentation, CBO planning, monitoring and dairy marketing.

Ecological outcomes

The UCC initiatives have led to significant ecological outcomes within the KMGT LPA, demonstrating improvements in forest health, wildlife populations and rangeland management.

Forests. The KMGT LPA is predominantly covered by conifer forests, encompassing 78,631 ha or one third of the LPA. These forests provide critical habitats for endangered species and a diverse range of rare plants, herbs and berries. Compared to the 2018 baseline, forest conditions have significantly improved, with reduced logging and notable regeneration observed (Marshall-Stochmal et al. 2020). The UCC has implemented an annual forest-cleaning event, a signature initiative in Arkhangai, focusing on clearing 63 ha and rehabilitating 8 ha of forest. These efforts help eliminate debris, promote new growth, prevent wildfires and provide herders with additional income while supplying towns with affordable firewood. Additionally, constructing fences around young trees has effectively supported natural regeneration by preventing damage from livestock. These events serve as collective missions for UCC members, fostering team spirit and enhancing their contributions to community wellbeing while strengthening social capital. In 2023, the initiative engaged 70 members from nine forest CBOs and five partner organisations to clean a 10-h area, resulting in the harvesting of 960 cubic meters of firewood, benefiting 240 households with discounted prices, generating over US$14 thousand in income for participating herders.

Wildlife. The KMGT LPA is home to several globally threatened species, including the Mongolian marmot (*Marmota sibirica*), Siberian musk deer (*Moschus moschiferus*), snow leopard (*Panthera uncia*), Siberian ibex (*Capra sibirica*) and white-throated bush chat (*Saxicola insignis*). Notable bird species such as the Saker falcon (*Falco cherrug*) and Steppe eagle (*Aquila nipalensis*) also inhabit the area. The UCC's annual monitoring of musk deer, marmots and birds has indicated an increase in marmot populations, stable musk deer numbers and consistent bird survival, alongside herders reporting increased sightings of deer and marmots. Key factors

contributing to these positive outcomes include the implementation of institutionalised conservation measures, such as regular SMART patrols by community rangers and annual joint patrols conducted with Arkhangai law-enforcement agencies and UCC rangers, which help prevent and detect poaching and illegal logging. The positive changes in herders' attitudes and increased public awareness within the UCC and neighbouring communities have further supported these conservation efforts.

Rangelands. The KMGT LPA's mountain forest-steppe ecosystem is home to 191 plant species, predominantly perennial herbaceous plants (87%), including 52 medicinal plant species and 22 that require protection. Notably, this includes one endangered species (*Gentiana macrophylla* Pall.), ten rare plant species, one endemic species (*Astragalus galactites* Pall.) and ten species classified as intermediate endemics.

However, the ecosystem faces significant challenges because of a doubling of livestock numbers over the past decade, such that carrying capacity is exceeded by 6–30 times in summer-autumn pastures and 2–5 times in winter-spring pastures across the LPA (Ariunsuren 2012). To address these issues, the UCC has organised various management training sessions and supported livelihood diversification activities aimed at reducing reliance on livestock products, such as tourism, forage planting and forest cleaning. While engaging private livestock holders has proven challenging, livestock numbers have decreased by 15.6%, with a notable decline in number of goats compared to 2018.

Discussion

This study illustrates the transformative impact of the UCC on the KMGT LPA. The findings indicate that improved organisation and community engagement empower herders to become environmental stewards, aligning with existing literature on the efficacy of local institutions in conservation efforts (Berkes 2007, Ostrom 1990). Significantly, the role of herder women emerges as essential in both conservation and pastoralism; their contributions, ranging from managing community activities to facilitating knowledge sharing, underscore the importance of empowering women in pastoralist societies for enhanced environmental stewardship and resource management. While UCC initiatives have led to improvements in forest health and wildlife populations, persistent rangeland degradation because of overpopulation of private livestock poses ongoing challenges. This highlights the necessity for continued efforts to address economic pressures contributing to overgrazing. Increased demand for underutilised livestock products (skin, hides, wool and hair) could incentivise herders to reduce their herd sizes. Currently, herders mainly sell cashmere, camel wool and meat, while byproducts are often discarded or low-priced. If demand for these additional products were boosted, herders could earn more from each animal, potentially reducing livestock numbers and alleviating overgrazing pressure. However, for this to succeed, stricter rangeland management regulations would be vital.

In conclusion, this study demonstrates the potential for CBC initiatives to bring about positive change while emphasising the need for adaptive strategies that consider socio-economic dynamics. Fostering resilience within pastoral communities is crucial for preserving the vital ecosystems they depend upon.

Acknowledgements

We express our gratitude to the ZSL for funding support, which enabled completion of both baseline and endline assessments for evaluating the social and ecological outcomes of the KMGT LPA.

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