

Rangelands and pastoralism in Central Asia and Mongolia: challenges and perspectives

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Abstract

Livestock herding contributes 10-45% of national GDPs across the Central Asia and Mongolia (CAM) region while supporting the livelihood of nearly one-third of the region's population. Over 171 million herds graze the region's rangelands, occupying 65-73% of the territories in Central Asia (CA) and Mongolia. Traditional pastoralism has been affected dramatically by climate change. For the last decades, the annual mean air temperature has risen two to three times higher than the global average in CA and Mongolia respectively. Annual precipitation has a decreasing trend over the same period, causing increased aridity, a decline in lakes and rivers leading to a reduction in plant species and biomass production, an increase of barren areas. Extreme climatic events such as wildfire and drought—as well as a winter weather disaster called *dzud*—have increased in frequency and severity, causing livestock mortality and diminishing pastoral livelihoods. These trends have been observed across the region, where pastoral livestock husbandry remains an important economic sector while preserving the nomadic identity. However, most herders are insufficiently protected from climate-induced disasters left highly vulnerable to risks and external shocks.

Hence, pastoral herders' key adaptation strategies, including improving rangeland management by joining formal herder organizations, introducing more productive livestock breeds, improving livestock productivity, increasing essentials facilities, winter shelters, forage production, and well construction, require multi-level partnership and multi-stakeholder support. Only by addressing the existing gaps in knowledge and science, the Governments of Mongolia and CA countries will help tackle adaptation challenges faced by herders, including rangeland degradation caused not only by a warming climate but also by the failures in pastoral governance. The CAM states see the great opportunity for global partnership and actions by designating the International Year of Rangelands and Pastoralism (IYRP) to sustain pastoral heritage across the region for generations.

Keywords: Rangelands; climate change adaptation, knowledge gap, multistakeholder support

Introduction

The CAM region covers six post-socialist countries of 5,667,116 km² areas, spanning from the Mongolian Plateau in the east to the Ustyurt and Turgay Plateaus in the west (UNSTAT, 2019). The geography of the region is extremely varied, including Great Gobi, Karakum and Kyzylkum deserts, the high mountain ranges of Altai, Tien Shan, the Pamirs in the CA with altitudes reaching 7439m, and foothill plains, steppes, and temperate grasslands. Isolated from the oceans and adjacent to the great desert's location determines the region's temperate continental climate with hot summer and cold winter. The mean annual temperature in Mongolia fluctuates between -8 to 6°C (Natsagdorj *et al.*, 2017), while it ranges from 2°C in northern Kazakhstan to 18°C in Turkmenistan and southern Uzbekistan, and below 0°C in the mountainous regions (Chen *et al.*, 2019). Vegetation varies by ecological zones in the CAM: major types in CA include forests (account around 1.5% of the vegetated area), grasslands (39.34%), crops (18.98%), shrubs (22.27%), and sparse vegetation (17.31%) (Jiang *et al.*, 2017). Mongolia's vegetation varies by altitude, rainfall, and soil type having alpine tundra (3.0% of total area), mountain taiga (4.1%), mountain steppe (25.1%), steppe (26.1%), desert steppe (27.2%), and desert (14.5%) (Hilbig, 1995). Around 110.3 million ha or 71% of land area are covered by grassland, and about 9% are covered by forest or shrubland (NSO, 2019).

The CAM region has a total of 77.6 million ethnically-diverse population: ranging from 33.5 million in Uzbekistan to 3.3 million in Mongolia (UNSTAT 2019). The agricultural sector contributes 5.2% in Kazakhstan, 7.5% in Turkmenistan, 18.5 % in Uzbekistan, 20.8% in Kyrgyzstan, 23.3% in Tajikistan (Hamidov *et al.*, 2016) and 15% in Mongolia (Banzragch *et al.*, 2021) by providing high-value food, income, employment, and foreign exchange. Pastoralism is an important economic and cultural activity tracing back to prehistoric times (Kerven, 2011) evolved from the millennia human adaptation to continental climate shaped by region's geography. The CAM contains 171.2 million heads of livestock, including sheep (53%), goat (24%), cattle (18%), horse (5%), and camel (.5%) (FAOSTAT, 2019) that contributes key export products such as meat and cashmere. Pastoral practices in CAM countries have undergone dramatic socio-political changes from the 1930s, going through forced collectivization with livestock nationalization, increased crop farming and sedentarisation and decreased mobility (Mirzabaev *et al.*, 2016) with prevailing agro-pastoralism

in CA (Kerven, 2011). All six countries became independent from the Soviet influence in the early 1990s, starting transition to a free-market economy with livestock privatization and the collapse of state cooperatives.

In CAM countries, the land tenure remains under state property, except that Kazakhstan allows some private ownership on a limited scale (Mirzabaev *et al.*, 2016). Under prevailing state management, some countries formally allow longer-term use rights through land registration, certification, contract use, or lease to individual farmers/herders, groups/farms, companies, and state entities (Fernandez-Gimenez, 2006; Mirzabaev *et al.*, 2016) by adopting state land regulations. As such, the land tenure systems are diverse across countries: in Kazakhstan, six types exist by land-agent category (from small village system to State Land Reserve Fund); three types in Tajikistan by land use rights; annual ticketing for pasture use by self-governing village bodies in Kyrgyzstan; and state cooperative or farmer association-managed system in Uzbekistan and Turkmenistan (Mirzabaev *et al.*, 2016); and soum/district government management in Mongolia allowing leases of spring and winter camps to herder households.

Challenges for CAM pastoralism

The CAM pastoralism has been increasingly challenged by warming climate and rangeland degradation for the recent decades. Climate change displayed in the temperature rise, at the rate, approximately two (Jiang *et al.*, 2017) to three times that of the global average (0.74°C) in CA and Mongolia, respectively (Banzragch *et al.*, 2021) with slightly decreasing precipitation exhibiting spatially heterogeneous changes across the region. Studies identified that these variables have different influences on different vegetation types: with more serious degradation is observed in the Karakum and Kyzylkum Deserts, the Ustyurt Plateau, and the wetland delta of the Amu Darya (Jiang *et al.*, 2017) and north-central and north-eastern Mongolia (Banzragch *et al.*, 2021; NAMEM, 2018). These factors adversely impact land productivity through soil moisture loss, soil salinization, and biomass decline which leads to increased risks for climatic hazards such as drought and dzud with livestock mortality and diminishing livelihoods (Chen *et al.*, 2019).

The extent of the rangeland degradation in CAM countries has been disputed with conflicting results due to varying methods, perspectives, and the lack of regional-scale research (Jamsranjav *et al.*, 2018; Robinson, 2016). Mongolia's national rangeland health assessment conducted in 2016 found that 42% of rangelands was in a non-degraded "reference" state, 34.6% slightly or moderately degraded, and 23.1% severely or totally degraded (NAMEM 2018). A recent study of CA vegetation change found a significant increasing trend in vegetation growth in the eastern part, whereas a significantly decreasing trend was found in the western part of CA (Jiang *et al.*, 2017) from the combined effect of reduced precipitation and increasing temperature. Shrubs and sparse vegetation in the southern part of the Karakum Desert Ustyurt Plateau and the wetland delta of the Large Aral Sea have been degraded due to human activities such as oil and gas extraction (*ibid.*). Similarly, in Mongolia, land areas under mining increased by 157% over the past decade (NSO, 2019). In the absence of pastoral institutions, individual pastoralists undertake de-facto pasture management because they lack sufficient financial capacity for seasonal movement. These pastoralists also face difficulties for accessing remote pastures due to broken infrastructure such as bridges, roads and water supply causing overgrazing in village pastures and wintering areas (Robinson, 2016). Therefore, both climatic and anthropogenic effects were identified as the main drivers of the rangeland ecosystem deterioration. These include increased livestock numbers concentrated near roads, settlements and markets, leading to overgrazing, shifting herd structure (more goats), loss of traditional rangeland management practices, decreased seasonal movements, and the lack of institutions for rangeland management, weak infrastructures, particularly watering points, and inadequate veterinary services (Fernández-Giménez *et al.*, 2017; Mirzabaev *et al.*, 2016).

Key issues of rangelands and pastoralists in the CAM region

To sustain economically viable food production, pastoral livelihoods, and cultures in the region, the following issues have to adequately addressed:

Issues affecting rangelands and pastoralists

- Lack of formal recognition of pastoralists' customary institutions and land tenure rights;
- Insufficient regulatory and financial support to emerging community-based management institutions;
- Reduced herd mobility and seasonal pasture rotations leading to overgrazing;
- Unplanned and corrupted land use changes for crop cultivation, mining and infrastructure fragmenting rangelands;
- Overexploitation of rangeland resources for fuel, water extraction, timber production and pharmacology;

- Increasing conflict over rangelands among mobile pastoralists, state authorities, and crop farmers;
- Increased climate change risks: prolonged droughts, severe floods, frequent fire, dust storms etc.;
- Improper delivery of mobile services i.e., veterinary, health, education, energy, and water points;
- Declining herder populations resulting in aging and potential lack of generation turn-over, loss of traditions
- Lack of financial support to enhance pastoralists' contribution to the economy and food security;
- Infectious diseases as a threat to local breeds, livestock mortality, and transfer to humans.

Knowledge & science gaps about pastoralism and rangelands

- Insufficient research on regional-scale measuring changes in rangelands, vegetation, soil, and water
- Lack of social studies assessing pastoral institutions, pastoralists' wellbeing, including access to services;
- Lack of appropriate recognition and integration of indigenous knowledge with modern science;
- Evaluation of impact of policies on rangeland restoration and pastoralists governance;
- Less attention to local livestock breeds adapted to climatic hazards risk;
- Lack of research about the economic viability of pastoralists and their contribution to food security;

Actions proposed to conserve pastoralist's territories at various dimensions

- Acknowledge pastoralists customary territories through robust legal regulatory frameworks to prevent forced allocation of their lands to other purposes (development projects and green grabbing);
- Empower community-based rangeland institutions through participatory processes;
- Facilitate cooperation among researchers, governmental institutions and pastoralists to review policies;
- Lobby for awareness-raising about the importance of rangelands and pastoralists through IYRP;
- Develop a research agenda on the resilience of pastoralists and their contribution to food security;
- Create a dynamic map on the status of rangelands and pastoralists territories to conserve them worldwide;
- Assess the vulnerability of pastoralists production system to plan coping strategies with climate change;
- Support climate change adaptation strategies of pastoral communities (water harvesting, forage production etc.) towards strengthening the resilience;
- Encourage pastoral communities to establish their institutions based on their customary governance systems and recognize and support at various levels to play a key role towards sustainable pastoralism;
- Foster actions of community-based institutions to strengthen the mobility and rangeland management;
- Provide mobile services on health, education, veterinary, livestock breeding, etc. through extension services for higher productivity;
- Allocate financial resources for building capacity of young generations of pastoralists and provide incentives for entrepreneurship and innovations to encourage their stay in pastoralism;
- Incorporate pastoral production as one of the foundations of the local and national economy;
- Support pastoralists to save livestock genetic diversity and locally adapted breeds;
- Invest in strong advocacy on socio-ecological values on pastoralists among the general public to encourage pastoralists youth in conservation of their bio-cultural diversity.
- Develop and implement a rangeland restoration program involving professionals and herders to reverse the current degradation levels by introducing adequate ecosystem payment schemes

Conclusion

The 5,667,116 km² portion of Eurasia across territories of the six countries of CAM is the largest contiguous dryland on Earth, providing a home to 77,6 million people and 171,2 million heads of livestock dominated by sheep and goats, critical for supporting pastoral livelihood and national economies. The CAM's pastoral social-ecological systems with thousands-years of rich heritage and cultural diversity has been challenged by increasing climate threats and anthropogenic impacts for the past several decades. The region has evolved from the same socio-political past, shifting from a centrally-planned socialist system to a free market economy. The CAM countries have increasingly faced the rangeland degradation partly because of the failure of state regulatory policies', weakened rangeland management institutions, and the loss of customary governance systems which prevailed under neo-liberal free-market developments.

A priority for CAM states is to address key drivers of rangeland ecosystem deterioration and other contributing factors, in cooperation with the global community. This will help safeguard vulnerable pastoral communities' wellbeing and protect a substantial portion of their national economies. In this context, the Government of Mongolia proposed a designation of an IYRP, which has been supported by 14 countries and 160 organizations and endorsed by the UN Food and Agriculture Organization's Council.

The IYRP can support much needed global partnership and multi-stakeholder dialogues to tackle the complex systemic issues, promote and apply evidence-based experiences and pastoralists' rich traditional knowledge. The CAM states acknowledge the need for building synergy among the multilateral policy instruments, to help legal recognition of pastoralists customary rights over their territories and rangeland resources. International instruments include the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) "Art. 31.1" and the Programme of Work on Protected Areas (PoWPA) of the CBD, Nagoya Protocol on Access and Benefit-sharing, the Land Degradation Neutrality (LDN) of the UNCCD.. In addition, the CAM countries can utilize the IYRP for developing regional strategy and action plan to reduce rangelands degradation and promote the pastoral way of life and stop any discrimination against pastoralists in the region.

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