Pastures Under Pressure

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As climate change accelerates, the shift has diverse and severe effects on Central Asia, particularly in Kyrgyzstan, where a substantial temperature rise is expected relative to the global average (Lipka, 2017, p. 135). While local communities contributed minimally to this global phenomenon, they face unimaginable burdens, raising questions about environmental justice and the future of marginalised populations (Hussain & Khan, 2026, p. 250). Early signs of this change have already caused aridification and affected the water supply, and will further endanger the agricultural sector, other natural systems, and human health (pp. 135, 138). The country's territory is 85% pasture, of which nearly 30% is highly desertified, 27% is at a medium stage of desertification, and 17% is at an early stage of desertification (p. 148). While nomadic pastoralists living on these lands have established sophisticated knowledge systems over the centuries through intergenerational knowledge, seasonal patterns, and mountain ecology, all of it might be lost due to significant disruption from climate change (Hussain & Khan, 2026, p. 249) and other restrictive policies.

However, Ostrom's (1990) theory of commons governance suggests that self-organised communities can unite and manage common-pool re-

sources (CPR) sustainably despite external climatic pressures. This theory shifts the attention from portraying pastoralists as passive victims of climate change to recognising their agency and local knowledge as essential for climate adaptation. We can therefore explore how such practices, and commons-based resource governance more broadly, contribute to a model of climate adaptation that addresses climate-induced conflict in Kyrgyzstan.

Commons Governance and Collective Action Theory

Most theories of natural resource management, such as the 'tragedy of the commons' by Hardin (1968), perceive individuals as trapped, requiring external assistance to solve collective action dilemmas (Ostrom, 1990, p. 182). Yet, Ostrom (pp. 15, 34) argues that CPR dilemmas can be better solved through cooperative strategies by the participants themselves (pp. 15, 34). To understand such an argument, it is crucial to clearly define the concept of CPRs.

Firstly, Ostrom's (1990, p. 30) theory focuses on renewable resources, which are resource systems that can keep producing useful resources over time under sufficient conditions (p. 30). Secondly, CPRs are natural or man-made resource systems that, due to their magnitude, make it costly to exclude potential users from obtaining the resource, while one person's use also reduces the availability for others (p. 30). Furthermore, rather than being private, governmental, or open-access property, institutionally they fall under common property regimes, in which "Each member of the ownership group has the right to access and use group-owned resources in accordance with established rules by the group" (Cole & Ostrom, 2012, p. 42). Therefore, CPRs are not open to all but are governed by collectively agreed-upon rules, and it is of utmost importance that management relies on mutual negotiation, trust, and responsibility.

Recognising CPRs this way shows that the core governance challenges lie in two interrelated issues: appropriation and provision problems (Ostrom, 1990, p. 47). Appropriation problems focus on how to fairly allocate the use of shared resources among multiple users, especially when common resources can degrade through overuse (pp. 47-48). In contrast, provision problems concern the maintenance and restoration of the resource systems (pp. 47-48). To understand how communities overcome these two interrelated challenges, Ostrom (1990, p. 37) turns to contingent strategies, such as adapting one's actions depending on whether others comply with agreed-upon rules. Through this, individuals can foster trust and cooperation, enabling flexible reactions to others' actions (p. 36). This reflects CPR dilemmas as a relational system that sustains durable cooperation. Therefore, framing the situation as an assurance game better represents the outlined dynamics, as CPR appropriators can coordinate establishing trust and a sense of community (pp. 39, 43, 46).

Following these conceptualisations, Ostrom (1990, pp. 185-186) established 8 institutional principles that legitimise and enable long-term bottom-up approaches: (1) clearly defined boundaries; (2) rules tailored to specific CPR characteristics; (3) designed by local appropriators; (4) monitored; (5) involving gradual sanctions; (6) establishing conflict resolution mechanisms; (7) not challenged by external authorities; and (8) organised through nested institutions. Moreover, one cannot simply expect individuals to opt for new rules when benefits exceed costs; rather, everyone undergoes a complex evaluation process (p. 210). Therefore, Ostrom (1990, p. 211) listed six pre-conditions for rule change: (1) common judgement by appropriators that the status quo will have harmful consequences on the resource; (2) most appropriators will be affected similarly; (3) appropriators highly value the continuity of their activities; (4) there are low transformation and enforcement costs; (5) appropriators have trust and reciprocity; and (6) the appropriator group is small and stable. This reveals that the emergence of effective cooperation regarding CPRs does not come from above; rather, it is a collective judgment based on several individual perceptions.

Pastoralists engaging in Commons Governance in Kyrgyzstan

Traditionally, pastoralists followed the natural seasonal changes in floral composition, considering grass regrowth across different areas (Yu & Kasymov, 2020, p. 2). However, in Kyrgyzstan, this all changed when the country became part of the Soviet Union and the system of collectivisation was enforced through centralised management, which disrupted many migration routes (Hussain & Khan, 2026, p. 252). Following the fall of the USSR, new constraints emerged in the form of privatisation, heavy mining and militarisation of borders (p. 253). Many policymakers and public administrators at the time and still today believe that centralised control or the privatisation of resources is a sufficient system for protecting the commons from overconsumption (Baerlein et al., 2015, p. 497). Yet, as Ostrom's (1990) theory outlined, communities could escape CPR dilemmas. In Kyrgyzstan, despite the changing institutions and norms, communities demonstrated adaptive resilience and applied traditional ecological knowledge flexibly in many areas (Hussain & Khan, 2026, pp. 253, 269-270). However, as seen throughout the country's history, all these efforts can be limited and erased by restrictive ecological and political regimes (Hussain & Khan, 2026, p. 271), especially when also considering climate change.

In Kyrgyzstan, early signs of acknowledging commons governance emerged around 2009 with the so-called 'The Pasture Law', which shifted the governance of pastures to communities (Shigaeva, 2020, p. 91). The legislation established formal local institutions called Pasture Users Associations (PUAs), which have decision-making authority, and executive bodies

named Pasture Committees (PCs) (Shigaeva, 2020, p. 93; Yu & Kasymov, 2020, pp. 3-4).

Despite these seemingly positive developments empowering bottom-up communities, studies show that the expected outcomes of this decentralised system have not been fully realised due to the lack of meaningful involvement of local resource users (Shigaeva et al., 2016, p. 91; Dörre, 2015, pp. 2, 16-17). As the establishment of these institutions was carried out through a top-down process by governmental agencies, pastoralists are unaware of their rights and obligations and lack meaningful participation and the power to influence formal rules of pastoral management (Shigaeva et al., 2016, p. 99). Many also perceive the established organisation as not representing the community's interests, but rather as a tool aimed at excluding them from decision-making and imposing taxation (pp. 91, 99). This mirrors the failure to fulfil Ostrom's (1990) second and third principles on collective choice and matching local needs and conditions (p. 99). In practice, this leads to unclear rules that result in conflict and differing interpretations, and many local users continue to follow their own practices while simultaneously ignoring official management plans (p. 99). Additionally, studies show that there is a lack of appropriate boundaries (principle 1) as there is "a mismatch between the ecological boundaries of the relevant natural resources, community- level social boundaries (...), and administrative boundaries attached to different land types and land use purposes" (p. 100).

Therefore, based on focused case studies in Kyrgyzstan, it is suggested that these community-based management systems require an approach in which government agencies and local groups share decision-making, aligning traditional and modern governance approaches (Hussain & Khan, 2026, p. 272; Dörre, 2015, p. 17). Shigaeva et al. (2016, p. 100) also argue that contextual analysis and early research on community capacity are required before introducing new resource initiatives. Furthermore, during the transition, support with financing, technical expertise, and education should be provided as needed and requested by communities (Dörre, 2015, p. 17).

Despite certain issues in practice, there are strong positive signs of collective decision-making that support theories of local commons governance (Shigaeva et al., 2016, p. 100). For instance, communities without external involvement agreed to give 'pastures some rest', taking into consideration long-term individual and group interests (p. 100). However, traditional ecological knowledge remains an "undervalued adaptive resource" (Hussain & Khan, 2026, p. 272), despite many studies showing that these systems restore vegetation faster than top-down governmental initiatives (p. 272).

Conclusion

These environmental changes not only lead to the loss of physical nature but also to the erosion of social structures (Hussain & Khan, 2026, p. 251). The International Land Coalition Asia (2021) similarly highlights that pastoralists remain underrepresented in national policy frameworks, despite their crucial role in climate adaptation (p. 253). To conclude, in answering the research question, this paper has argued, drawing on Ostrom's (1990) theory of commons governance, that the case of Kyrgyzstan demonstrates how pastoral communities, through their extensive ecological knowledge, can strengthen the sustainable use of shared pastures even under increasing climatic stress. However, this potential can only be achieved when commons-based governance is genuinely participatory and supported rather than imposed through top-down institutional reforms. Strengthening inclusive commons governance can also reduce the risk of climate-induced conflict by creating locally legitimate mechanisms and establishing trust among resource users. As climate change intensifies competition over increasingly scarce natural resources, such frameworks become crucial for preventing disputes from escalating into large-scale instability. More broadly, this paper argues that policymakers should view community-based resource governance not only as a tool for environmental sustainability but also as a means of strengthening conflict prevention, environmental justice, and long-term climate resilience across Central Asia.

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