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Marginality, climate and resources in pastoral rangelands: Oman and Mongolia

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On the Ground

- Oman and Mongolia feature different political systems and physical landscapes yet represent similar challenges encountered across global pastoral societies.
- Extractive industries disrupt pastoral drylands through reorienting government policy, environmental change, altered water supply, and infrastructure factors that challenge livelihood viability.
- The impact of climate variability on rangeland livelihoods is now exacerbated by policy and development decisions.
- Herder livelihoods at different income and development levels are dependent on government policy and risk mitigation strategies to maintain customary practices.
- The combination of multiple external forces stress rural viability and contribute to out-migration from herding systems.

Keywords: pastoralism, rangelands, climate, resources, Oman, Mongolia.

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For millennia, nomadic pastoralism has been a sustainable livelihood because of herders' ability to manage risk in marginal landscapes.[1] Today's mobile pastoralism is being seriously impacted by new environmental and social forces, exemplified by climate change, government policy, and resource extraction, which restrict movement and customary livelihoods.[2] As pastoral risk magnifies, understanding of how climate trends, evolving herding practices, and national planning strategies affect the viability of pastoral systems across the globe becomes vital.[3,4] Two nations where pastoralism is prominent, Oman and Mongolia, reflect the modern challenges to mobile livelihoods.[5] In both countries, governments encourage settlement or provide limited support for customary lifestyles whilst favoring extractive industries for tax revenue. As climate, policy, and extraction affect pasture quality, water resources, and the rural landscape, these forces contribute to loss of livelihoods and herder displacement. Yet the knowledge, adaptability, and resilience of pastoral livelihoods suggest their enduring value in an era of environmental and socio-economic change.[6,7] Our article explores these contemporary dynamics in the two traditional pastoral societies.

Pastoralism is prevalent in dryland regions where domesticated animals efficiently convert limited ecological productivity into sustenance for people. Climate variability significantly impacts livestock raising and human well-being in rangelands where mobile herding provides effective management of environmental risk.[4] Furthermore, shifts in governance and the reorganization of pastoralism due to socio-economic pressures are often confronted with mining and large-scale resource extraction that competes for, and reconfigures, the land that pastoralists inhabit.[8] This dynamic has the effect of changing land use, re-directing government policy, and altering herder access to pasture and water while potentially degrading the landscape and removing pastoral peoples' customary tenure rights.[7] The immediacy of climate change and development policy is evidenced by how the resulting metamorphosis disorders pastoral communities' herding practices and traditions. As the ability to make a living from animals is affected by drought, extreme cold, storms, degradation, and reduced vegetation, access for livestock herding may become unviable.[9] The result is out-migration first from traditional homelands, then to towns, and finally abandonment of herding as a livelihood to search for jobs in cities.

Pastoral environments have long been home to subsistence herders in marginal arid and semi-arid landscapes. Today 200 million people, predominantly in Africa, the Middle East, and Asia, use herding to create lives based on extensive land use and mobility.[10] Great changes in environmental and socio-economic conditions are prevalent across pastoral societies as states seek to balance divergent risks, interests,

and objectives. Herders' struggles with climate change, environmental variability, and livelihood transitions are exemplified in diverse nations such as Iran, China, and Kyrgyzstan, through Kenya, South Sudan, Mali, and Senegal to Peru and Bolivia.[4] Warming trends, extreme weather events, and greater volatility typify changing climates across pastoral regions. Balancing the fundamentals of herding with changes in climate and development is a great social and political challenge. Further, pastoralism is commonly perceived as a marginal, backward livelihood, leading governments to stress settlement and integration through policy, services, and control measures.[11] As pastoralism, climate, and development become part of an unsettled present, we examine the trajectories, challenges, and possibilities in Oman and Mongolia, two societies where pastoralism was once the dominant livelihood. The countries represent two divergent transition arcs. Oman is a sultanate where nation-building and oil-fueled development has transformed Omani society over the last four decades. During this time pastoralism has remained a subsistence economy while its significance has declined. Since 1991, Mongolia has embraced a market economy and parliamentary democracy. Today a vibrant civil society coexists with high (36%) poverty levels. In the vast steppe environment more than 30% of the population remains dependent on herding (Fig. 1).

Table 1. Selected social indicators and data related to Oman and Mongolia.[17]

Indicator	Oman	Mongolia
Herders, %	7	>30
Population (million)	3	2.9
GDP (PPP) p/c	23,133	3,673
Government	Autocratic	Democratic
Arable land, ha p/c	0.04	0.16
Malnutrition rate	8.6	5.8
Food, % income	30	38.6
Food import, % total	70	30
Mean precipitation, mm	139	204
Mean temperature,-C	28	0
Animal type	Goat, camel, sheep	Sheep, goat, horse, camel, cattle

p/c indicates per capita. Sources: CIA Factbook 2013, related sources.

Climate and Pastoralism

Changing climates have a significant influence on pastoralists who pursue environmentally dependent livelihoods.[12] In harsh hot and cold landscapes the ability to obtain adequate fodder to fatten animals is the endemic challenge. Shifts in weather patterns, seasonality of precipitation, moisture for plant forage growth, and recharge of sub-surface water sources are vital to herding viability.[3] As pastoral sustainability is jeopardized, food provision, jobs, social stability, and even state security become concerns as reflected in recent protests in Oman[13] and Mongolia[14] (Table 1). In Oman a 0.6°C annual temperature increase and a

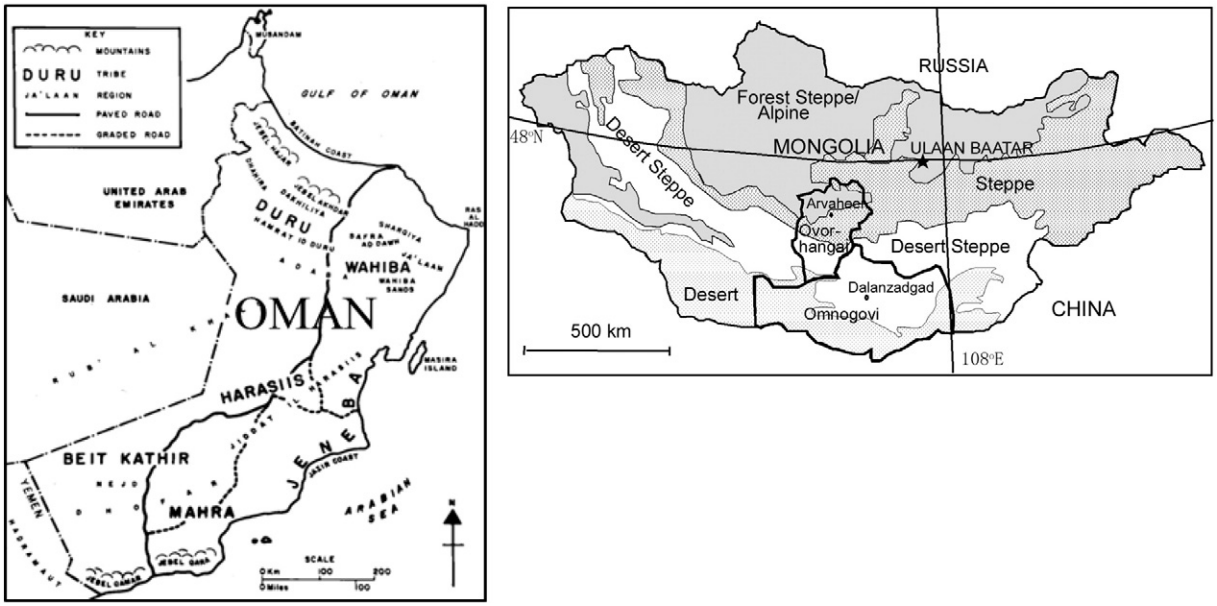

Figure 1. Oman (left) with main pastoral tribes (312,000 km^2, avg. temperature 28C). Mongolia (above) main mining areas (1.56 million km^2, avg. temperature 0C).