



## **Beyond grasslands: valuing the societal contributions of India's rangelands and pastoral systems**

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### **Abstract**

Rangelands and pastoral systems in India have traditionally been viewed primarily through the lens of livestock production, often overlooking their broader societal contributions. India's rangelands, particularly those nestled in the high-altitude Himalayan regions, are much more than mere grazing lands; they are lifelines for pastoral communities like the Chopans and Gujjars and are crucial to the country's ecological and cultural fabric. The rangelands of Jammu and Kashmir, Himachal Pradesh and Uttarakhand, with their rich biodiversity and fragile ecosystems, play a pivotal role in maintaining ecological balance. They support a unique form of pastoralism, where traditional practices have evolved in harmony with the environment, ensuring the sustainable use of these landscapes. Beyond their ecological significance, these rangelands are reservoirs of indigenous knowledge and cultural heritage, sustaining communities that have thrived in these challenging terrains for centuries.

This paper highlights how these landscapes contribute to food security through livestock rearing, support biodiversity, regulate water cycles, and sequester carbon, thus playing a crucial role in mitigating climate change. The research presents compelling case studies from Himalayan region, demonstrating how traditional pastoral systems have preserved these rangelands but and enhanced their resilience to environmental changes. This novel perspective underscores the need for holistic valuation methods that capture the dynamic interplay of ecological, economic, and cultural dimensions, paving the way for more sustainable and equitable rangeland governance and social cohesion.

However, these vital landscapes are increasingly under threat from land-use changes, climate variability, and the marginalization of pastoral communities in policy-making. This paper advocates for a more inclusive approach to valuing rangelands, recognizes their full societal contributions and integrates them into national and regional development strategies. It seeks to influence policy frameworks that will ensure the sustainable management of rangelands by safeguarding them for future.

## Introduction

India's rangelands have traditionally been associated with livestock grazing while this perspective underscores their role in food production. It fails to capture their broader societal, ecological, and cultural contributions. In regions such as Jammu and Kashmir, Himachal Pradesh, and Uttarakhand, rangelands support biodiversity, sustain pastoral livelihoods, and maintain ecological processes that benefit society at large (Sharma et al. 2003). Communities such as the Gujjars, Gaddi and Chopans have practised pastoralism for centuries, adapting to the challenges of these fragile landscapes while maintaining sustainable resource use (Ingty 2021). In order to manage rangelands sustainably and guarantee that they continue to offer vital resources and services (Singh et al. 2021), this indigenous knowledge is crucial. Livestock rearing is a primary livelihood activity for millions of people in India, contributing to household income and local economies (Mitra 2013). However, land-use changes, climatic unpredictability, and the exclusion of pastoral voices from policy-making processes pose growing risks to these crucial ecosystems. According to Roe et al. (2009), rangelands have deteriorated as a result of pastoral communities' absence from land-use planning and decision-making procedures.

This study seeks to shift the narrative surrounding India's rangelands from a narrow focus on livestock production to a holistic valuation that encompasses ecological, cultural, and economic dimensions. By drawing on case studies from the Himalayan region, it aims to demonstrate the multifaceted contributions of rangelands while advocating for policies that secure their sustainable management. Through the use of customs and traditions that have accumulated over the ages, pastoral societies like the Chopans and Gujjars have established complex interactions with these environments. This is something that requires attention to study these areas more. In India, rangelands especially those found in the high-altitude Himalayan regions have long been underestimated for the contributions they provide to society, frequently being relegated to the status as animal grazing areas (Bhasin 2011). This limited viewpoint ignores the many functions these landscapes perform in sustaining pastoral communities, safeguarding cultural legacy, and ensuring ecological equilibrium. In addition to being essential for raising cattle, the rangelands of Jammu and Kashmir, Himachal Pradesh, and Uttarakhand are also important ecosystems that support biodiversity, and control water cycles, all of which help to slow down climate change (Wagner 2013).

## Methods

A qualitative approach was employed to understand the ecological and societal contributions of rangelands: that includes literature review related to the published studies on biodiversity, carbon sequestration, and water cycle regulation in India's rangelands that provided a foundation for this research. Along with that case studies to document examples from the Himalayan regions of Jammu and Kashmir, Himachal Pradesh, and Uttarakhand are analyzed to illustrate the diverse contributions of rangelands while highlighting the interplay between traditional pastoral systems and rangeland sustainability. Interviews and focus group discussions with Gujjar and Chohan pastoralists were conducted to capture indigenous knowledge and cultural practices.

## Results

Rangelands here serve as vital ecological corridors, linking fragmented habitats and supporting diverse species. Pastoral practices, that surprisingly involving almost every member of the family without any discrimination on the behalf of age,sex,gender , such as rotational grazing, enhance ecosystem resilience by allowing vegetation to recover and reducing soil erosion. Carbon sequestration potential in grassland soils is substantial, contributing to climate change mitigation. Additionally, these landscapes play a critical role in hydrological cycles, facilitating groundwater recharge. Rangelands also play a crucial socio-economic role, especially for marginalized communities like the Gujjars, Chopans, and other pastoral

groups in India. These communities depend on rangelands for their livelihoods, and the services provided by these landscapes form the backbone of their economic activities. Rangelands are integral to the livelihoods of pastoral communities, providing grazing resources for livestock that sustain local economies which in turn will help sustain the national economy. These communities contribute to food security through the production of dairy, meat, and wool. Furthermore, the migratory routes and seasonal camps of pastoralists preserve traditional knowledge and foster social cohesion within and between communities.

The results highlights that women's involvement in pastoralism often extends to decision-making processes about herd management and land use. In some cases, especially in Uttarakhand, women may also take on leadership roles in community-level governance of rangelands, advocating for sustainable practices and mediating conflicts over resource use. However, despite their significant contributions, women there often face gender-based discrimination and limited access to resources and decision-making power.

Rangelands contribute to the broader rural economy by providing resources that support secondary industries, such as handicrafts and local markets there in addition to the direct income and livestock products, livestock by-products, such as hides, wool, dung, and manure which are valuable. In many rural areas, cow dung is used as a source of fuel, while wool from sheep and goats is used in weaving industries. Nonetheless, the problems of direct access to market, value-chain and intermediaries were reported. Seasonal movement between different grazing areas allows pastoral communities to optimize grazing and prevent overgrazing in any single area. Mobility was found to be a helping hand to creates economic linkages between different regions, with pastoralists engaging in trade, exchanging livestock, wool, and other goods as they travel. So, this way mobility has provides social benefits too, as it fosters inter-community connections and collaboration, which can help with managing common resources and resolving conflicts but it also creates conflicts too.

As the results supported the Dangwal(2009), rangelands of the Himalayan regions, hold significant cultural value for the communities that depend on them but some are started to settle down in one place or chose to be less mobile in terms of frequency. These landscapes are not only resources for livelihood but also integral to the spiritual, social, and traditional practices of pastoralists. Rangelands in Uttarakhand and Himachal often host sacred spaces, such as temples, shrines, and sacred groves, which are considered vital for the spiritual life of pastoral communities, however, Kashmir is exception. For example, in the Himalayan regions, sacred groves are protected areas within rangelands where the community believes that natural spirits dwell. These groves are not only areas of biodiversity conservation but also sacred spaces that influence local religious practices and social norms. These cultural practices help reinforce the connection between the community and the land. Additionally, social identity is often tied to the practice of pastoralism. The deep knowledge of rangeland ecosystems and livestock management is passed down through generations, shaping a community's sense of identity and belonging. Indigenous knowledge systems play a central role in the cultural aspect of rangeland use. pastoral communities includes knowledge about animal behavior, grazing cycles, plant species, and weather patterns. In the context of rangelands, this traditional knowledge enables communities to adapt to changing environmental conditions, optimize grazing, and manage the health of both livestock and landscapes. This knowledge is often codified in cultural practices, local governance structures, and community-based management systems that promote the long-term health of rangelands.

## **Discussion**

The findings reaffirm the multifaceted value of India's rangelands, extending beyond their utility as grazing lands. Traditional pastoral practices exemplify a model of sustainable land management, balancing productivity with ecological health. These practices have evolved in harmony with the environment,

ensuring the resilience of both human and natural systems. Culturally, rangelands house sacred sites and pilgrimage routes, reflecting their spiritual significance and their consideration of herd as a member of family is show their sense of belongingness. Rangelands also serve as reservoirs of indigenous knowledge, encompassing animal husbandry practices, medicinal plant usage, and ecological stewardship strategies even young members of communities understand these things. This knowledge, if leveraged, can inform contemporary conservation and development policies. Not only this but also empowering women in these communities can enhance the effectiveness of rangeland management and contribute to overall socio-economic development. However, the degradation of rangelands due to unsustainable agricultural expansion, infrastructure development, and climate change poses a significant challenge. Policy frameworks that prioritize industrial and urban development often marginalize pastoral communities, leading to the erosion of traditional knowledge and land-use practices. To safeguard these landscapes, a paradigm shift is needed in how rangelands are valued and managed. This includes:

- Integrating rangeland conservation into national climate adaptation and biodiversity strategies.
- Establishing participatory governance models that empower pastoral communities in decision-making processes.
- Promoting research and development initiatives focused on sustainable pastoral systems and rangeland restoration.

The societal contributions of rangelands ranging from food security and biodiversity conservation to cultural preservation highlight their importance in achieving sustainable development goals. Weber et al. (2004) argue that pastoralists possess detailed knowledge of their environment, which is crucial for sustaining their livelihoods and maintaining ecological balance. It also elaborates on the cultural and socio-economic functions of rangelands, providing deeper insights into their importance beyond just ecological roles while recognizing and enhancing these contributions is crucial for fostering resilience in the face of environmental and socio-economic challenges. However, rangelands also contribute to the broader national economy in ways that are often undervalued in conventional economic assessments. The cultural and socio-economic functions of rangelands are central to the livelihoods of pastoral communities in India. Rangelands not only sustain food security and economic productivity but also preserve rich cultural traditions, social identities, and community ties. The integration of indigenous knowledge and sustainable practices is essential for maintaining these functions in the face of challenges such as climate change, land-use pressures, and socio-political marginalization. Understanding and valuing the full spectrum of cultural and socio-economic contributions of rangelands is crucial for developing policies that ensure their conservation and the continued well-being of pastoral communities. According to Fernandez-Gimenez (1999), such religious connections to the land help ensure its sustainable management as the communities perceive themselves as guardians rather than exploiters of these spaces. Although rangelands are essential to rural economies and the environment, policy discussions have frequently overlooked their governance. The study highlights the need for more inclusive and participatory governance, arguing for policies that incorporate pastoralists' traditional knowledge into land management frameworks and acknowledge their rights. These regulations need to encourage sustainable grazing methods and guarantee that pastoral communities are involved in rangeland resource management.

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