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In Search of Undisturbed Grazing Lands: The Beleaguered Himalayan Pastoralists

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Abstract: Pastoralism, as a human survival strategy, evolved thousands of years before the advent of agriculture and other forms of sustenance. Its continued practice in various geographical areas, particularly in the high-altitude Himalayas, underscores the sustainability embedded in this way of life. Pastoralism has been vital to the cultural and economic survival of numerous communities across regions such as the Western Himalayas of Ladakh and Himachal Pradesh, Central Himalaya in Uttarakhand, and the Eastern Himalayan regions of Sikkim and Arunachal Pradesh. This paper aims to examine various issues related to the number of pastoral communities engaged in pastoral grazing, the developmental challenges that directly and indirectly affect resource availability in rangelands, and the recent problems arising in these rangelands and their migratory routes due to various developmental initiatives in the high-altitude Himalayan areas.

Key words: Pastoralism, Himalayas, developmental challenges, sustainability.

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Pastoralism and agropastoralism are the only means of production possible in the high-altitude Himalayan region, and more so above the timberline. The unique set of natural resources spread across the inaccessible and tough terrain, and the natural resources along with the grazing resource base are the key features of this system. The alpine pasture lands are located mostly in the high-altitude regions and in the Trans-Himalaya region, rising above 3,000 m. Most of the nomadic pastoral and transhumant agropastoral communities stay in such regions from April to October to graze their livestock and cattle for four to five months (Hoon, 1996; Miller, 1999; Sabarwal, 1999, Farooquee, 1998; 1999). The onslaught of globalization and the expansion of the market economy have transformed production processes and reshaped the socio-economic and socio-political contexts of diverse production systems, including pastoral and transhumant grazing practices. Recent developments over the past three decades have led to a decline in grazing resources, reduced availability of quality pastures, and increasing sedentarization of transhumant and nomadic pastoralists.

The nomadic pastoral communities have existed in high altitude of five Himalayan states of Arunachal Pradesh,

Sikkim, Uttarakhand, Himachal Pradesh, and Ladakh (Farooquee *et al*., 2011; Singh *et al*., 2013). Pastoralism continues to remain the crucial to the cultural and economic survival in the high-altitude Himalaya. The main pastoral communities of the Himalayan region are Gujjars and Bakerwals who belong to Jammu and Kashmir, Changpa yak herders of Eastern Ladakh, the Gaddi, Gujjar, Kinnaura, Lahaula, and Pangwala pastoral communities of Himachal Pradesh, the buffalo rearing Gujjars and sheep and goats rearing Bhotiya communities in Uttarakhand. The main pastoral communities in Eastern Himalaya are the Bhutia and Dokpas who traditionally herd yaks in high-altitude areas, and Nepali communities like Gurunga, Mangar and Chettri who rear cattle and sheep, alongside indigenous Lepchas and Limboos who also engage in livestock rearing alongside farming. Monpa Yak herders are the main pastoral community of Tawang in Arunachal Pradesh (Farooquee *et al*., 2011).

The Gujjar and Bakerwal pastoral communities in Jammu and Kashmir numbered over one million according to the 2011 Census, making them the third-largest ethnic group in the region. The total number of people actively involved in the seasonal migration was estimated to be around 600,000 to 630,000. The total number of pastoral communities in Himachal Pradesh according to 2011 census was Gaddi community as the largest pastoral group, with a population of over 178,000 of which only about 30% practise pastoralism. Another pastoral community is the Gujjars, with approximately 92,500 individuals engaged in pastoralism. The collective pastoral animals in the state were estimated at around 2 m sheep and goats and 500,000 buffaloes. The total number of Bhotiya pastoral community in Uttarakhand was around 39,106 in the 2011 Census, but many have shifted to other livelihoods or migrated permanently from their villages. According to a 2012–2013 report of the Uttarakhand Sheep and Wool Development Board, approximately 157,000 sheep and nearly 8,000 other domestic animals were reported to utilize alpine pastures (bugyals) annually; however, the report documented livestock numbers rather than the number of pastoral households or herders associated with these migrations. There's no single, precise figure for the total pastoralist population in Sikkim, but estimates suggest a significant decline from past numbers from around 20,000 to 2000s individuals due to policy changes and shifts to other livelihoods, though pastoralism remains crucial in alpine regions.

Existing Status and Changes in High Altitude Pastoralism

Recent developments in Jammu and Kashmir rangelands: In recent times, the growing water scarcity due to declining snowfall has led to a decrease in the discharge of water in many high-altitude springs and drying of a few springs. This has put pressure on the pastoralists in Jammu & Kashmir to look for new water sources for their herds, and many of them have modified their grazing routes. A few community-led efforts to harvest rainwater through small artificial ponds in high-altitude pastures have proved to be a potential solution to it. The Alpine Pond Project, led by the Government of Jammu and Kashmir, which supports over 230 pastoral households, has emerged as a model for this new climate adaptation, combining both local knowledge and scientific insight. Due to the recent decline in winter rainfall, the alpine meadows, and the streams which had sufficient water which once gushed through their pastures are now drying up. Water is now becoming scarce, and the quality of meadow grass is degrading. In the Alpine Pond Project, the location of each pond is guided by community-led mapping of traditional grazing routes, seasonal migration patterns, and water scarcity hotspots. By building ponds in surplus grazing zones with underused pasture potential, the project helps ease pressure on overused rangelands and distribute livestock more evenly across the landscape.

To address these challenges, the forest department is carrying out a census of springs in the subalpine and alpine zones. The goal is to map and assess the condition of all springs, documenting details like their size, water storage, encroachments, and usability. This data will help in policy planning and rejuvenation programmes for these crucial water sources. "Most importantly, these springs are crucial for nomadic and tribal communities, especially pastoralists, who depend on them for both drinking water and livestock needs during their seasonal migrations."

Recent Rangelands Issues in Himachal Pradesh: In recent times, aapproximately 100,000

families in Himachal Pradesh rely on pastoralism as a primary or supplementary livelihood. These include communities such as the Gaddi, Gujjar, Kinnaura, Lahaula, and Pangwala, who practice seasonal migration (transhumance). In January 2025, the Himachal Pradesh Forest Department officially recognized and mapped 1,637 key traditional pastoral routes and halting sites across the state, a major step toward supporting their movement. Between the towering Pir Panjal and Zanskar ranges in the Himalayas, lies one of the largest pasturelands called Thanpattan, spanning approximately 570 square kilometres. The pastures of Thanpattan region are of great significance for the local livestock herders as well as the herders of the Gaddi communities of the Chamba and Bharmaur districts. Thanpattan area is regarded as a biodiversity haven with a rich flora and faunal diversity. It also has several renowned protected areas, such as Pin Valley National Park, Chandratal Wildlife Sanctuary, and Kibber Wildlife Sanctuary, which are located in Spiti Valley in the Lahaul-Spiti district.

Researchers found that most of the varieties of trees planted by the forest department in the last 40 years have been unpalatable to livestock. Until the 1990s, government plantations replaced broad-leaved tree species (such as *Quercus leucotrichophora* A. Camus (Ban oak) or *Acacia catechu (L.f.) Willd* (Black catechu tree) and pastures with pine species, which produce commercially viable resin and timber but are unpalatable to animals. More recently, there has been a greater emphasis on native broad-leaved species, but shrubs, herbs, and native meadows have been ignored. These plantations have made Gaddi livelihoods more vulnerable because the land is enclosed and their access routes blocked. The planting of tree species that animals cannot eat means there is less fodder available. New plantations also provide habitats for invasive shrubs, which decrease livestock health and growth. As a result, many Gaddis have changed their migratory routes. They either have shortened their migration — some herders in Spedu do not go all the way to Lahaul and Spiti in summer — or shift routes to other areas in neighbouring Mandi district.

According to Census of India 2011 (Scheduled Tribe Population Tables), the Gaddi population of Himachal Pradesh is approximately 178,000. Subsequent research on Himalayan pastoralism indicates that many Gaddi households have diversified away from traditional transhumant pastoralism, with scholars warning that declining livestock mobility may reduce grazing-mediated ecosystem management and weaken customary claims over alpine grazing lands, potentially facilitating alternative land uses such as hydropower or mining development.

Developments in Uttarakhand Rangelands: The major rangelands of Uttarakhand representing the cold desert ecosystems condition are located in the Nilang Valley of Jad Ganga (Jahnavi) in Uttarkashi district, ranges of Alaknanda and Niti and Girthi valleys in Chamoli, upper Johar valley of Munsyari, and Darma and Byans valleys located at the trijunction of India, Nepal, and the Tibetan plateau of China. Since these valleys are very close to Great Himalayan range and receive higher precipitation as compared to Nilang and Western Dhauli, they support higher vegetation cover and greater species diversity (Rawat 2007). All four trans-Himalayan valleys in Uttarakhand have been used by the local as well as migratory pastoral communities from the lower districts for several centuries. Major classes of vegetation in these rangelands include scrub steppe, alpine marsh meadows, mixed herbaceous formations, fell-field (cushionoid vegetation), and moss lichen communities in the sub-nival zone.

Pastoral communities in the region, such as the Bhotias, Gaddis, and Bakarwals, follow traditional seasonal migration routes, moving to higher altitudes in the summer and lower areas in the winter. According to a 2012-2013 report from the Uttarakhand Sheep and Wool Development Board, which provided data on the number of sheep and other domestic animals in various alpine pastures (bugyals) across the state, indicating approximately 157,300 sheep and nearly 8,000 other domestic animals utilizing these lands annually at that time, but not the number of people herding them. Now there is a significant decline in traditional transhumant pastoralism in the Uttarakhand region in recent years due to various factors, including climate change impacts, labor constraints due to out-migration, and land-use restrictions.

Recent Challenges in High Altitude Pastoralism

There are various factors which have contributed to the recent challenges for high

altitude pastoralism all across the Indian Himalaya, some of the most glaring challenges shaping the high-altitude pastoral landscape are declining quality and quantity of rangeland, the construction of roads and development of new activities due to the construction the roads, penetration of market economy in far flung remote high altitude villages and rangelands include, education, communication and changing social values, and unclear tenure rights often leading to increasing conflicts between sedentarised village population and the forests officials with the pastoral communities.

Construction of Roads and Development: In most of the Indian Himalayan states, different kinds of activities have begun in the high-altitude regions, ranging from the construction of motorable roads, tunnels, bridges, and dams, which have led to the sprouting up of new settlements, the beginning of supply chains of essential food items, to increasing vehicles and tourists. All these have led to the shrinking of alpine meadows and other grazing lands of the region, mostly located near India's border. Several strategic national security projects have also started near India's border, and for the smooth completion of these projects, Government of India has exempted all such projects within a range of 100 km from international borders from environmental clearance and are only subject to comply with Standard Operating Procedures (SOP) as notified by the central government.

This is pursuant to the amendments to the Environmental Impact Assessment (EIA) rules in 2022. It has resulted in a drastic increase in several developmental activities in the region after the enactment of the new law. Although the controversy over environmental clearance for development projects in ecologically sensitive high altitude border areas have raised serious environmental concerns due the fragility of the ecosystem and ethical dilemmas for the indigenous pastoral communities. Now, the pastoralists find it difficult to travel on their traditional migratory path, most of which has been taken over for construction of four-lane highways. In addition to this, a number of small and medium hydro power projects specially in Uttarakhand have further forced them to change their migratory routes apart from declaration of new conservation parks and biosphere reserve has further worsened kept the pastoralists outside of protected and conserved areas.

Quality of Rangelands and Availability of Water: The pastoral herders utilize the available grazing resources of the alpine regions of the Greater Himalaya and the alpine arid rangelands of the Trans-Himalayan region, which are sparsely vegetated in the form of desert steppe, scrub steppe, high alpine grass, and sedge communities. The pastoralists visit the trans-Himalayan rangelands because it has numerous wetlands. The pastoral communities have used these areas for livestock grazing since centuries, and have thus inherited a very good understanding of palatable grazing resources, their growing period and suitable time of grazing. They have also lived in harmony with nature and have gathered rich knowledge of rich flora and fauna, including several endemic and globally threatened species. One of the key features of rangeland vegetation in Ladakh is alpine marsh meadows, which form only about 2-3 % of the vegetation and have relatively low standing biomass (31.99 g m^{-2}). Yet such areas support a considerably high livestock, especially during winter months (Rawat, 2025).

*Hardship and Changing Social Values***:** High-altitude pastoralism is increasingly becoming less attractive and a more challenging occupation from individual, community, and institutional points of view. The economic and social hardships have increased over the years, and the cooperation from the local villagers/ sedentary farmers has declined drastically due to the gradual shrinking of productive grazing land. The pastoralists have to endure the hardship of the high-altitude life throughout their stay in the rangelands and the younger generations of herders are not as hardy and tough physically like their parents and so they do not enjoy the hardships and their occupation. Now there is decreasing interest amongst the new generation of pastoralists to take up the traditional herding due to physical hardships, the increasing awareness of urban life style and new opportunities and shrinking of grazing resources. The present-day generation considers herding as a low activity, considers it a wild, labour-intensive, and backward job without any social reputation. Hence, the interest in continuing their traditional occupation is very less in the new generation. The practice of pastoralism in general has been on a significant

decline over the past decades due to the factors mentioned.

Decreasing Pastoral Manpower and Flock Size: According to a report, as many as 178,000 Gaddis in Himachal Pradesh have given up their pastoral livelihoods and animals and found alternative income sources, according to the Registrar General of India 2011. Few reports on Himachal Pradesh have further suggested that now a larger number of pastoralists are keeping smaller herds of sheep and goats with more contained grazing patterns. This may lead to reduced resource extraction or grazing, and the loss of Gaddi livestock could result in the degradation of ecosystems that are dependent on Gaddi livestock for preventing the ingrowth of woody plants by grazing and/or for redistributing nutrients. Earlier, the herders previously defended their grazing rights; in the absence of herders it may be easier for others to claim those lands for mining or hydropower development (www.thethirdpole.net/2021). Similarly, a number of publications indicate the decline in the number of pastoralists practising migration and grazing. Hence, there is a need for a census of pastoral communities and the number of livestock and cattle, since India has a significant population of pastoralists. Every year, thousands of pastoralists, along with their animals, make periodic journeys on foot, from one climatic region to another, for the availability of food, and to take advantage of suitable pastures and grasslands. About 20 million pastoralists graze the country's forests and grasslands, according to organisations working with the pastoral communities. But there are no official numbers, as till now, there has not been much recognition of the age-old livelihood practice of transhumance pastoralism in livestock management. It is heartening to note that the Government of India will be counting its pastoral livestock, enumerating pastoral communities and their contribution to the livestock sector, as part of the 21st Livestock Census, which was launched in October 2025.

Conclusions

High-altitude pastoralism in the Indian Himalaya represents a historically evolved livelihood system uniquely adapted to fragile alpine and trans-Himalayan ecosystems where agriculture is severely constrained. Pastoral and agropastoral communities have long sustained both local economies and ecological balance through seasonal mobility and careful use of rangeland resources. However, over the past three decades, globalization, market integration, changing social aspirations, and expanding infrastructure development have significantly transformed these systems. Declining grazing resources, climate-induced water scarcity, land-use change, forest policies, and conservation restrictions have reduced mobility and accelerated the sedentarization of pastoral communities. Across Himalayan states, pastoral populations and livestock numbers are gradually declining, accompanied by shrinking traditional knowledge systems and weakening customary grazing rights. At the same time, evidence shows that pastoral livestock play an important ecological role in maintaining alpine biodiversity, nutrient cycling, and grassland health. Development interventions, plantations of unpalatable species, and competing land uses have further increased livelihood vulnerability. The growing disinterest among younger generations highlights the socio-cultural transition underway in mountain societies. Sustaining Himalayan rangelands therefore requires policies that recognize pastoralism as both an ecological service and a viable livelihood. Improved data, participatory governance, climate adaptation measures, and institutional recognition of transhumant mobility are essential to ensure the long-term resilience of high-altitude pastoral systems.

Competing Interests

The authors declare no competing interests.

References

Farooquee, Nehal A. 1998. Development and the decreasing role of livestock in the Central Himalayan transhumant society. *International Journal of Sustainable Development and World Ecology* 5(1): 43-50.

Farooquee, Nehal A. 1999. Change in Pastoralism in the Indian Himalaya. *Cultural Survival Quarterly*,22(4): 25-27.

Farooquee, Nehal A., Pernille Gooch, R.K. Maikhuri, D.K. Agrawal. 2011. *Sustainable Pastoralism in the Himalayas*. Indus Publishing Company. New Delhi.

Hoon, V. 1996. *Living on the Move: Bhotiya of the Kumaon Himalaya*. Sage Publications, Delhi.

Miller, D.J. 1999. Nomads of the Tibetan Plateau Rangelands in Western China, Part 3: *Pastoral Development and Future Challenges*. *Rangelands* 21(2): 17-20.

Sabarwal, V. 1999. *Pastoral Politics*. Oxford University Press, New Delhi.

Rawat, G.S. 2007. Pastoral practices, wild animals and conservation status of alpine meadows in Western Himalaya. *Journal of Bombay Natural History Society* 104 (1): 251-257.

Rawat, G.S. 2025. Rangelands of Indian Trans-Himalaya: Sustaining Ecosystem Services and Pastoral Livelihoods. G.B. Pant Memorial Lecture - 2025 Memorial Lecture: XXXI. G.B. Pant National Institute of Himalayan Environment (NIHE), Almora. https://www.researchgate.net/publication/392645537_Pastoralism_in_Transition_Anecdotes_from_Himachal_Pradesh_-_A_Commentary [accessed Feb 27 2026].

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