Singh and Kerven *Pastoralism (2023)13:21*
https://doi.org/10.1186/s13570-023-00283-7

Pastoralism: Research, Policy and Practice

EDITORIAL Open Access

Pastoralism in South Asia: Contemporary stresses and adaptations of Himalayan pastoralists

Rashmi Singh[1,2*] and Carol Kerven[3]

Abstract

We discuss the main findings in the *Special issue on Pastoralism in South Asia* from the eight papers based on research conducted in the Himalayan region of South Asia. An overview is presented of pastoralism in the Himalayan region, including India, Pakistan, Nepal and Bhutan. Drawing parallels with the global stresses to pastoralists, papers in this special issue highlighted three sets of contemporary stresses to the pastoralists of the Himalayan region viz. (a) lack of herding labour, associated changing aspirations of youth and decline in traditional knowledge systems; (b) continued stresses from the state and between the formal and informal institutions; and (c) climatic stresses and associated impacts on the rangeland and livestock health. A synthesis of findings from all eight case studies suggests how the issues around pastoral livelihoods and rangeland management in the Himalayan region are entangled across social, political and ecological dimensions. However, instead of only being impacted by the stresses, the pastoral communities are showing adaptations to various kinds of uncertainties and variabilities. Based on these findings from across eight sites in the Himalayan region, we argue that understanding of the problems as well as proposed solutions from the policymakers should be tailored according to the particular social, political and ecological contexts. Other than the issues given prominence in this special issue, the role of markets and social security are some of the other important concerns to be addressed in the region, which can be best addressed by creating an interface between pastoralists and policymakers, practitioners and the government, while making the best use of pastoral knowledge and their way of life.

Keywords Traditional knowledge, Labour, State policies, Local institutions, Access, Climate Change, Uncertainty, Adaptations

Introduction

The countries of South Asia are home to an extremely rich diversity of pastoral communities (Rao and Casimir 2003; Agrawal and Saberwal 2007; Dong et al. 2016a, b; Sharma 2011). Pastoral livelihoods and resource use in the region hinge upon adaptabilities in response to the particular socio-political and ecological variabilities. From the high-altitude Hindu Kush Himalayas to the hot deserts of the plains, often migrating with their livestock between ecological zones, pastoralists of South Asia are users and custodians of vast land areas along with its flora and fauna (Agrawal and Saberwal 2007; Bhasin 2011a; Hashmi et al. 2017; Kreutzmann 2012; Rao and Casimir 2003, Shah et al. 2012). However, there are other claims on this land—by a variety of state and non-state actors including farmers, town-dwellers, mining companies, urban developers, tourism and nature conservationists. The combinations of these claims and land usage

*Correspondence:
Rashmi Singh
rashmi89singh@gmail.com
[1] School of Human Ecology, Ambedkar University Delhi, Delhi, India
[2] PASTRES, Institute of Development Studies, University of Sussex, Brighton, UK
[3] Department of Anthropology, University College London, London, UK

have a complex effect on the environment as well as on pastoral livelihoods.

The Himalayan region of South Asia which cuts across the political boundaries of Pakistan, Indian, Bhutan, Nepal and Tibet Autonomous Region of China, is a hot spot of pastoralists' communities including the nomadic, transhumant and agro-pastoralists across the region (Kreutzmann 2012). The region has been of interest to policymakers for two reasons: first, for biodiversity conservation, and second, for the development in the remote regions through meeting the ambitious green energy development targets through hydropower and solar power plants (Ahlers et al. 2015; Dhakal et al. 2019).

Even though the Himalayan region hosts a great diversity of pastoral communities, the majority of the more recent studies done in the region have been conducted with a focus on wildlife conservation conflicts with the pastoralists' communities of the region. A lack of in-depth understanding of pastoral resource use continues to influence policy spheres, hence adding more stress on the continuation of pastoral lifeways. State-induced interventions and policies resulting in restrictions on pastoral mobilities and conservation policies continue to be one of the biggest stresses to pastoral communities of the Himalayan region (Singh et al. 2020, 2022).

Resource sharing by livestock and wildlife in the region, especially in the Trans-Himalayas, is often seen as conflicting with conservation efforts (Ashraf et al. 2014; Bagchi et al. 2012; Berger et al. 2013; Kala 2005; Namgay et al. 2013; Sangay and Vernes 2008; Shrestha and Wegge 2008; Suryawanshi et al. 2010), with very few exceptions of coexistence (Bhatnagar 2009; Sharma et al. 2015). Only a handful of studies in the region explore the pastoral livelihoods, their knowledge systems and traditional resource use, contemporary pressures and local adaptabilities (Bhasin 2011b, 2012; Gooch 2009; Ingty 2021; Singh et al. 2013, 2015, 2020; Wu et al. 2014).

Pastoralist communities globally have been influenced by changing land tenure, land fragmentation and resultant loss of access to pastures due to state and private interventions, globalisation and its associated socio-economic and demographic changes, and global climate change (Galvin 2009; Reid et al. 2014). Focusing on the Himalayan region of South Asia with eight case studies, the aim of this special issue is to understand how these global concerns are manifesting in the Himalayan region. We highlight the key stresses in the region on pastoral communities and their responses and adaptabilities. The ultimate goal is to identify the policy responses which best address the current needs of pastoralists of the Himalayan region. In the absence of any review so far, the special issue provides an up-to-date status analysis on the state of pastoralism in the region.

The Himalaya and Himalayan pastoralists

According to Chatterjee and Bishop (2023), the Himalayan range stretches 1550 miles (2500 km) from west to east between Nanga Parbat (26,660 ft or 8126 m), in the Pakistani-administered portion of the Kashmir region, and east to Namjagbarwa (Namcha Barwa) Peak (25,445 feet or 7756 m), in the Tibet Autonomous Region of China. Though India, Nepal and Bhutan cover most of the Himalayas, Pakistan and China also occupy parts of the Himalayan range. In Bhutan and Nepal, the Himalayan region mostly covers the mountainous region of both countries. In India, the Himalayan region includes the newly constituted union territories of Jammu and Kashmir and Ladakh and Indian states of Uttarakhand and Himachal Pradesh in the west and Arunachal Pradesh and Sikkim in the east. In Pakistan, the Himalayan region is mostly limited to the Gilgit-Baltistan region and for Tibet, a small southern region of Tibet falls under the Himalayan region (Chatterjee and Bishop 2023) (Fig. 1).

A large area of the Himalayan range falls under the political boundary of India. Pastoral communities of western Indian Himalayas include *Changpa*s and *Brokpas* of Ladakh, who rear herds of sheep, cashmere goats, yaks and horses (Chaudhari 2000; Singh et al. 2013); *Gaddis*, who raise large flocks of sheep and goats; *Bakkarwals*, the nomadic goat herders; and *Van Gujjars* who rear buffaloes (Rao and Casimir 1982). The resource use and seasonal movement of the *Gaddis*, *Bakkarwals* and *Van Gujjars* are pervasive across the Indian states of Himachal Pradesh, Jammu and Kashmir, and Uttarakhand (Bhasin 2011a, b; Kreutzmann 2012; Namgay et al. 2013; Rao and Casimir 1982; Yamaguchi 2011). Some other agro-pastoral communities of the Trans-Himalayan region rear a mix of animals, including sheep, horses, cattle, goats and yaks, e.g. agro-pastoralists of the Lahaul and Spiti region (Mishra 2001; Singh et al. 2020). In the eastern Himalayas, the *Bhotias* of North Sikkim and *Brokpas* of Arunachal Pradesh are agro-pastoralists and raise herds of yaks (Verma and Khadka 2016). Other pastoral communities include *Gurungs* who are sheep herders and *Chettris*, the cattle herders of Sikkim (Bhasin 2011a) (Table 1).

In Pakistan, the Himalayan region consists of the Gilgit-Baltistan parts of Pakistan. The *Balti* community in the Baltistan area rear their yak, dzo and dzomo (male and female crossbred of yak), sheep, goat and cattle. The prime distinction between *Balti* and *Wakhi* community of yak herders is that *Wakhi* keep yak besides sheep and goat, and Balti keep crossbred cattle and yak—dzo and dzomo, other than sheep and goat. Both the groups keep cattle at their homes for domestic milk consumption. A few *Kirghiz* living in Kurumbar area traditionally keep yak. Communities including *Gujjar*, *Bakkarwal*, *Uigur*,

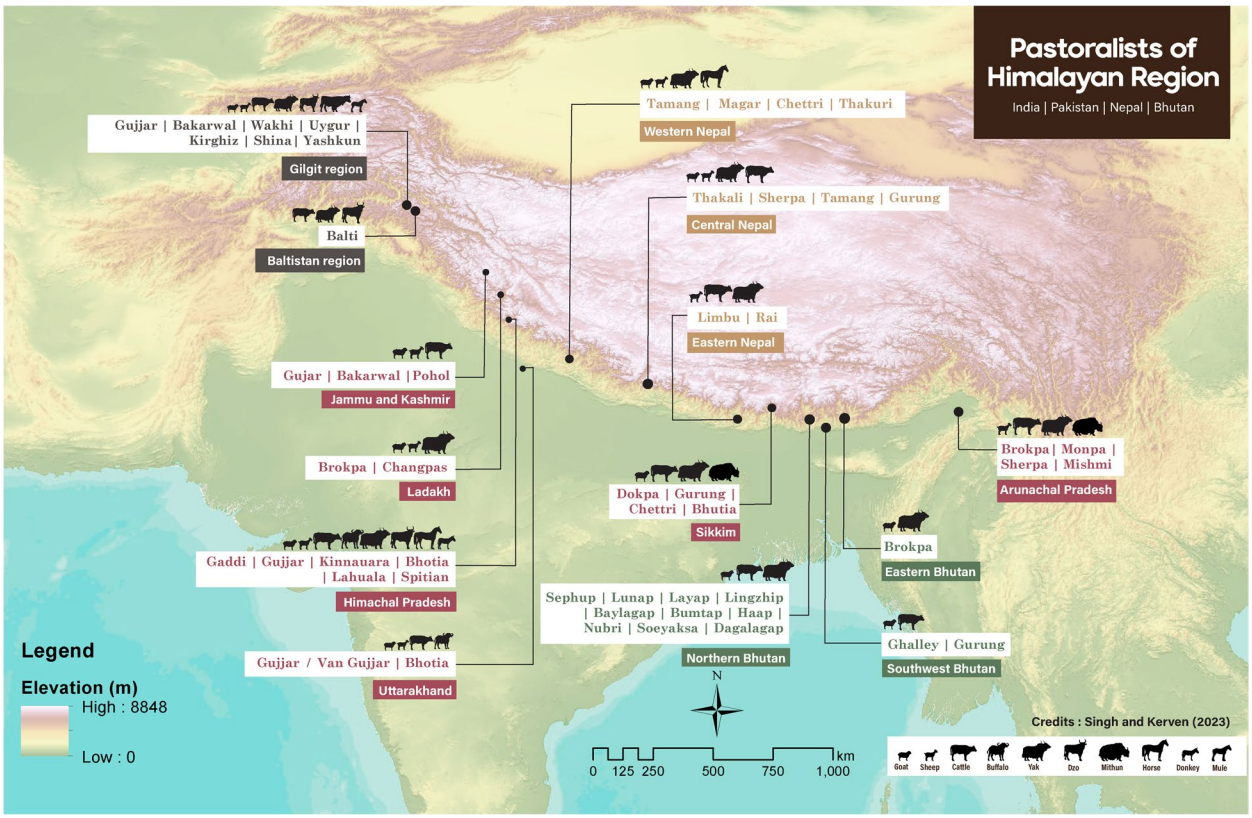

Fig. 1 Pastoralists of the Himalayan region across India, Pakistan, Nepal and Bhutan. Map credits: Gauri Dangol, ICIMOD (base map image: SRTM 90 m, boundaries DIVA-GIS). Design credits: Gurpreet Kaur Sokhi. Data source: secondary data analysis and primary data collection by the lead author

Table 1 Pastoralists of the Indian Himalayan region. Source: secondary data analysis and primary data collection by the lead author with resource mapping and interviews with the regional experts

India		
Community	**Region**	**Livestock species**
Gaddi	Jammu and Kashmir and Himachal Pradesh	Goat and sheep
Gujjar/Gujjar-Bakarwal/Van Gujjar	Jammu and Kashmir, Himachal Pradesh, Uttarakhand	Goat, sheep, cattle and buffalo
Bakarwal	Jammu and Kashmir	Goats and sheep
Kinnauara	Himachal Pradesh	Goat, sheep and cattle
Lahuala	Himachal Pradesh (Lahual and Spiti region)	Goat, sheep, yak, dzo[a], cattle, horse and donkeys
Spitian	Himachal Pradesh (Lahual and Spiti region)	Goat, sheep, yak, dzo/dzomo, cattle, horse and donkeys
Brokpa	Ladakh	Yak, sheep, goat and horses
Changpas	Ladakh	Yak and goat
Bhutia	Sikkim	Yak
Dokpa	Sikkim	Yak
Gurung	Sikkim	Sheep
Chettri	Sikkim	Cattle
Brokpa, Monpa and Sherpa	Arunachal Pradesh	Yak
Mishmi	Arunachal Pradesh	Mithun
Bhotia	Uttarakhand	Sheep

[a] Dzo are crossbred cattle and yaks

Table 2 Pastoralists of the Pakistan Himalayan region of Gilgit-Baltistan. Source: secondary data analysis and primary data collection by the lead author with resource mapping and interviews with the regional experts

Pakistan		
Community	**Region**	**Livestock species**
Balti	Baltistan region	Yak, dzo and dzomo[a], goat, sheep and cattle
Gujjar	Gilgit region	Goat, sheep and mule
Wakhi	Gilgit region (Kurumbar and Gojal area)	Yak, goat, sheep and cattle
Uygur	Gilgit region (Kurumbar area)	Sheep, goat and cattle
Shina	Gilgit region	Goat, sheep and cattle
Yashkun	Gilgit region	Goat, sheep and cattle
Kirghiz	Gilgit region	Yak, sheep and goat
Bakkarwal	Gilgit region	Goat, sheep, cattle and mules

[a] Dzo and dzomo are crossbreds of yak and cow, male and female, respectively

Table 3 Pastoralists of the Himalayan region of Nepal. Source: secondary data analysis and primary data collection by the lead author with resource mapping and interviews with the regional experts

Nepal		
Community	**Region**	**Livestock species**
Sherpa	Central Nepal	Yak and cattle
Tamang	Western Nepal	Yak and cattle
Thakali	Central Nepal	Yak, goat and sheep
Rai	Eastern Nepal	Yak and goat
Limbu	Eastern Nepal	Yak and goat
Gurung	Central Nepal	Sheep
Thakuri	Western Nepal	Yak, horses, sheep and goats
Magar	Western Nepal	Goat and sheep
Chettri	Western Nepal	Goat and sheep

Table 4 Pastoralists of the Himalayan region of Bhutan. Source: secondary data analysis and primary data collection by the lead author with resource mapping and interviews with the regional experts

Bhutan		
Community	**Region**	**Livestock species**
Brokpa (Merak)	Eastern Bhutan	Yak and sheep
Brokpa (Saktenpa)	Eastern Bhutan	Yak and sheep
Sephup	Northern Bhutan	Yak, cattle and sheep
Lunap	Northern Bhutan	Yak and cattle
Layap	Northern Bhutan	Yak
Lingzhip	Northern Bhutan	Yak
Baylagap	Northern Bhutan	Yak and cattle
Bumtap	Northern Bhutan	Yak and sheep
Haap	Northern Bhutan	Yak
Nubri	Northern Bhutan (Paro)	Yak
Soeyaksa	Northern Bhutan (Paro)	Yak
Dagalagap	Northern Bhutan	Yak and cattle
Ghalley	South West Bhutan	Sheep
Gurung	South West Bhutan	Sheep

Shina and *Yashkun* rear goats, sheep and cattle in the Gilgit region (Ehlers and Kreutzmann 2000; Kreutzmann 2012) (Table 2, Fig. 1).

In western Nepal, pastoralists including *Magar*, *Tamang*, *Thakuri* and *Chettri* communities rear yak, sheep, goat and horses. These communities are found across Limi valley, Humla and Dolpo region of western Nepal. *Thakali*, *Sherpa*, *Tamang* and *Gurung* are pervasive across the Manang, Thakkhola/Mustang and Rusuwa region of central Nepal. *Limbu* and *Rai* communities are found in eastern Nepal and rear goats, yak and cattle (Dong et al. 2016a and b; Joshi et al. 2020) (Table 3, Fig. 1).

In Bhutan, the eastern region has two distinct communities of *Brokpa*, *Meral* and *Saktenpa*, who rear yak and sheep. In northern Bhutan, pastoralists are known by the region that they are based in, including *Lunap*, *Layap*, *Lingzhip*, *Baylagap*, *Bumtap*, *Haap*, *Nubri*, *Soeyaksa* and *Dagalagap*, and rear yak, cattle and sheep. In south-west Bhutan, there are mostly *Ghalley* and *Gurung*, the sheep herders (Namgay 2014; Namgay et al. 2013) (Table 4, Fig. 1).

Lack of labour, changing aspirations and local knowledge

Lack of herding labour was found to be an important issue across the region. As rightly pointed out by Kreutzmann (2015) and Schmidt (2000), livestock rearing and management practices in the region heavily rely on social and cultural factors such as inter- and intra-household cooperation, as well as communal herding in the villages, and such practices are influenced by the availability of labour at the household, village or community level.

The decline in labour availability is connected to the phenomenon of globalisation leading to better connectivity, improved access to education and, thus, the changing aspirations of the new generation across the remote high-altitude pastoral regions (Kreutzmann 2012). Globalisation and the emergence of new kinds of markets are leading to changes in the aspirations of the new generation and outward movement from the system on the one hand (Aryal et al. 2018; Kassam et al. 2016) and the transformation of the livestock species composition and stocking densities on the other (Baird and Gray 2014; Singh et al. 2015).

It has been noted that with better access to education, the new generation spend the majority of their time away from their homes, hence absence from pastoralism. The new generation is thus neither keen nor equipped with the knowledge that has descended through generations in pastoral communities. Several studies across the region, over time, have highlighted this as an important issue to tackle, if pastoralism is to continue (Aryal et al. 2013, 2018; Namgay et al. 2013). For instance, the *Dokpa* herders of North Sikkim at the Indo-Tibetan border are the last handful of elderly households to continue pastoralism in the region (Luxom et al. 2022, this collection). The case of North Sikkim is indeed on one extreme, but the lack of labour and interest by the new generation to continue pastoralism in extreme climatic conditions and hardships, means shortage of labour surfaces as a prevalent problem in all the case studies.

The shortage of skilled labour was identified as the biggest challenge and problem associated with continuing pastoralism across three mountain valleys of Pakistan (Hameed et al. 2022). The harsh conditions and the time-consuming nature of herding, with a rather difficult lifestyle and the changes in the family organisation around herding responsibilities, were the key factors associated with shortage of labour. The primary reason in the case of Pakistan was reported to be the engagement of the younger generation in education, tourism and other alternative sources of income involving relatively lesser hardships and higher remunerations. In the case study from Bhutan in the special issue, a shortage of labour force was resulting in increased incidents of yak depredation (Dorji and Powrel 2022, this collection). To deal with the decline in manpower and interest of youth in herding, projected to result in a further decline in yak numbers, the authors suggested that appropriate schemes are needed to change the youths' attitude towards grazing practices as an attractive livelihood option.

As a local response to the shortage of labour, pastoralists in the western Himalayan region of Himachal Pradesh in India have been increasingly hiring herders as an adaptation. A detailed study by Malhotra et al. (2022) in this collection provides significant details on the issue of labour and hired herding in this region and elaborates on the practices and processes of hired labourers, termed *puhals*, due to the decline of young Gaddi sheep herders in pastoral activities. The practice of hiring *puhals* is culturally rooted in Gaddi pastoralism and provides a needs-based solution to the continuity of livestock rearing. The paper concludes that the adaptation in response to the labour shortage is not only related to the economic benefits for the Gaddi herders but is also associated with their cultural and occupational identity.

State policies, conservation agenda, local institutions and access

The state has historically played an important role in determining pastoral mobilities and land access across Asia. There have been different motives of the state with regard to pastoral sedentarisation across space and time (Dong et al. 2016a, b; Fratkin 1997). Some policies claim to provide better services and welfare to pastoral societies, but their primary motive is to extend control over the otherwise mobile pastoralists. For example, during the colonial period, policies of sedentarisation and restrictions on movements of pastoral communities in India were enacted with the aim of better controlling pastoral communities, using a narrative of pastoralists being lazy and living in backward ways (Gooch 2009). More recently, sedentarisation in South Asia is the consequence of changing land tenures, developmental schemes and exclusion through conservation initiatives and development projects like mining and energy transition projects (Nori 2022) which use the dominant narratives of degradation and desertification caused by pastoralists. Such narratives by governments globally have become a tool against pastoralists and have been difficult to break even after the emerging realisation of weak scientific backing for these claims (Behnke and Mortimore 2016). The trajectories of state intervention and associated legitimisation in South Asia have been dynamic both through the colonial period and post-colonial period, with a significant overlap.

The scientific understanding of rangeland functions and the narratives around the role of livestock grazing have moved beyond the linear understanding of the equilibrium rangeland ecological model towards the complex and more nuanced understanding of rangelands as social-ecological systems (Bond 2021; Gongbuzeren et al. 2018; Li and Li 2012; Reid et al. 2014; Vetter 2020) having a critical role in biodiversity conservation.[1] However

[1] See https://pastres.org/biodiversity/ for the six briefings on role of pastoralists in biodiversity conservation and environment protection.

government policies in the Himalayan region continue to work with the orthodox understanding of fortress conservation and pastoral evictions (Gooch 2009; Singh et al. 2021, 2022).

The case studies in the special issue indicate that rationalisation of state-induced restrictive policies against pastoralists in the Himalayan region continues to occur. Different paradigms of exclusion and their legitimisations are still prevalent, including the perceptions of pastoral societies as backward, the threat of imminent overgrazing and additional claims related to conservation revenue, development and climate change (Luxom et al. 2022; Srivastava 2022 in this collection). State-induced conservation policies and plans having limited consultations with the pastoralists are an additional layer of stress for the pastoral livelihoods, along with the failing compensation mechanisms for livestock losses to wild predators.

Pastoralists of the Himalayan region historically moved across international boundaries and had access to transnational pastures (Bhasin 2011a; Singh et al. 2013). However, with the current geopolitical conditions between India and China, loss of access to transboundary seasonal pastures has been identified as an important concern for pastoralists. Dokpa pastoralists of North Sikkim historically had a cross-boundary seasonal movement between India and Tibet, but after the Indo-China war in 1962, not only did the pastoralists lose access to seasonal pastures on the Tibet side, but also lost the cultural ties with the Dokpa families living in Tibet (Luxom et al. 2022, this collection).

Both state-induced stresses and the pastoral responses through local institutions have been identified as contextually different across the eight case studies. The article by Srivastava (2022, this collection) illustrates how the state has legitimised control over Gaddis through revenue and development, conservation and more recently applying the climate change narrative. Srivastava (2022) further argues that the restrictions put by the state have defined the timelines and routes of migration for Gujjars and Gaddis in Himachal Pradesh in India. However, the legal identities and social identities of Gaddis and Gujjars are variable and translate differently on the ground. These identities have colonial origins, which translate in the form of variable forms of pastoralism and continue to be negotiated and re-negotiated.

The case of *puhal* labour as discussed by Malhotra et al. (2022 this collection), in the context of Gaddi pastoralists in India, provides further insights into the role that the state plays, as well as multiple adaptation strategies used by pastoralists against the changing socio-economic scenarios. The hiring of *puhals* is one such tactic through which Gaddi pastoralism has continued, given that newer grazing permits are no longer issued by the state. Hiring of *puhals* through the local institutions of Gaddi pastoralists thus acts as a solution to the exclusionary mechanism put forward by the state by enabling sharing of permits and grazing grounds (Malhotra et al. 2022).

The absence of links between formal state and informal local institutions in the eastern Indian Himalaya of North Sikkim has resulted in a lack of access to state support by the Dokpa (Luxom et al. 2022 this collection). There is a need for better engagement between local institutions and the state actors for improved access to the state and non-state support for pastoralists. Similarly, Hameed et al. (2022) and Barsila et al. (2022) in this collection emphasise the need for the state to develop markets for livestock products and to implement policies that prevent farmland conversion of pastures near pastoral settlements. Barsila et al. (2022) underlines the role of local pastoral institutions and other formal and informal institutions for improved management of rangelands of Nepal (Barsila et al. 2022).

Climate change and pasture management

Traces of climate change impacts with extreme climatic events have been observed in the small pockets of alpine and high-altitude regions across the globe (Hurbert and Krishnaswamy 2018). The pastoralists of mountainous regions and drylands are particularly prone to climate change with the altered patterns and intensities of precipitation and droughts and the emergence of new kinds of diseases for both livestock and humans (IPCC 2019).

Several case studies underscore the influence of climate change on pastoral communities and their resource use across the Himalayan region (Rautela and Karki 2015; Sharma and Rai 2012; Vedwan 2006). The study conducted by Hameed et al. (2022) in northern Pakistan indicates changes in the timings and duration of annual precipitation which affect fodder availability for the livestock. Extreme precipitation events were leading to loss of access and connectivity to critical seasonal pastures due to the closure of roads and washing away of bridges.

Erratic rainfall patterns in the region are also linked with soil erosion and changes in the productivity of the pastures. Barsila et al. (2022) indicate the loss of grassland recovery due to erratic flood events, with changes in the timing and duration of precipitation, in Nepal. Another study in this issue from the western Indian Himalayan region of Spiti by Khanyari et al. (2022) highlights the decline in above-ground biomass being a result of changes in snowfall patterns. This is further leading to resource competition between wild ungulates and livestock, causing new challenges for wildlife conservation in these Himalayan rangelands (Khanyari et al. 2022). In addition to resource competition, the study points

to another important concern, of disease transmission between the livestock and wildlife.

While the majority of case studies mention the impacts of climate change on the rangelands, pasture management and livestock rearing, but with no support from the state, Srivastava (2022) in our collection discusses how instead of helping the pastoralists deal with the impacts of climate change, the government of Himachal Pradesh has instead used a 'climate change narrative' against the pastoralists, to legitimise the attempts to settle the Gaddis and Van Gujjars in the western Indian Himalaya.

To deal with the climatic variabilities and the associated extreme events, pastoralists suggested pasture rehabilitation, collective herding, construction of corrals (Hameed et al. 2022) and strategic planning of grassland management—where the natural event of annual flooding governs the above-ground biomass for livestock grazing (Barsila et al. 2022).

Discussion and conclusion

Drawing parallels with the global stress to pastoralists, papers in this special issue highlighted three sets of contemporary stresses to the pastoralists of the Himalayan region viz. (a) lack of labour, changing aspiration of youth and decline in traditional knowledge systems; (b) continued stresses from the state and between the formal and informal institutions; and (c) climatic stresses and associated impacts on the rangeland and livestock health. There is a growing wider recognition of the role of pastoralists and livestock grazing for biodiversity conservation (PASTRES 2023), mitigating climate change (Davies and Nori 2008), helping future food security (Krätli et al. 2013) and their inherent capacity to thrive with various kinds of uncertainties (Scoones 2023). Still, the narratives around pastoralism of being backward, causing rangeland degradation, villains of conservation and now climate change, continue to influence policy spheres in the Himalayan region. It is justly pointed out by Scoones (2023) that it is important to rework these narratives around pastoralism on the larger policy agenda levels—advocating an alternative recent understanding of the role of pastoralists and livestock grazing in biodiversity conservation, supporting diverse ecosystem functions and ensuring future food production under climate variabilities.

It is evident that the pastoral communities in the Himalayan region are dealing with multiple stressors. However, instead of only being impacted by the stresses, all the pastoral communities are showing adaptations to various kinds of uncertainties and variabilities, be it through the locally nested responses to the lack of labour in the case of *puhals*, or offering suggestions on dealing with climatic variabilities through communal herding and pasture rehabilitation. The absence of formal institutions and policy-based support for pastoralists remains a critical issue in the region as stated by Luxom et al. (2022) and Malhotra et al. (2022, this collection). It is well-established that pastoralist communities are capable of responding well to the socio-political and ecological risks and uncertainties through flexible local institutions. Case studies in this special issue show how the state and state-induced policies and restrictions continue to be the most important stressors on pastoralism, a dominant issue across continents where the state is 'acting to undermine the pastoral system rather than support them' (Scoones 2023).

A synthesis of findings from all eight case studies suggests how the issues around pastoral livelihoods and rangeland management in the Himalayan region are entangled across social, political and ecological dimensions. For instance, loss of access to critical pastures due to development interventions or transboundary closures has reduced the original grazing areas and resulted in increased grazing pressures on more limited areas (Luxom et al. 2022; Singh et al. 2013). Similarly, the shortage of labour and the decline in traditional knowledge has increased grazing pressures on the nearby village pastures, thus leading to their degradation (Singh et al. 2015, 2020). Lack of local knowledge among the hired herders has also resulted in increased incidents of predation (Dorji and Powrel 2022). These findings highlight how the problems around the pastoral systems can be better understood by having a multidisciplinary approach of research exploring the links between the social, political and ecological threads at the local to regional scale. The research focus on pastoral studies can thus benefit greatly from an interdisciplinary approach.

The understanding of the problems as well as proposed solutions from the policymakers should be tailored according to the social, political (Luxom et al. 2022; Malhotra et al. 2022; Srivastava 2022) and ecological understanding (Barsila et al. 2022; Dorji and Powrel 2022; Hameed et al. 2022; Khanyari et al. 2022) of the Himalayan pastoral landscape and resource use, which is contextually variable. A particular finding of the study by Luxom et al. (2022) emphasises the importance of stronger linkages between formal and informal institutions in the pastoral landscape for assuring access to state support to the members of pastoral communities.

Apart from these findings, it is critical to recognise pastoral knowledge and representation in the policy sphere. Within these representations in the Himalayan context, it is also important to be aware of the gender, class and caste perspective in terms of pastoralists' representation. Women hold an important role in livestock rearing and pastoral economies in the region (Verma and Khadka 2016), while caste and class play an important role in

defining access to state policies (Srivastava 2022). State interventions, especially conservation policies in the region, have resulted in social inequalities where wealthier herders gain exclusive access to resources at the cost of a complete full stop on pastoral practices by the weaker section of pastoralists (Singh et al. 2022). It is essential to recognise the social, cultural and economic diversity within a pastoral community in any given context, which also varies greatly between the pastoral communities of a given landscape. In addition to understanding social stratification, it is necessary to understand the local ecologies and the dynamics of resource use over space and time while designing policies. The issue of labour and knowledge is further important to ensure continuity of pastoralism in the region. This can be done through capacity building for the new generation.

Other than the issues given prominence in this special issue, the role of markets and social security are some other important concerns to be addressed in the region, which can be best addressed by creating an interface between pastoralists and policymakers, practitioners and the government, while making the best use of pastoral knowledge and their way of life.

Acknowledgements
We thank all the authors who have contributed to this special issue. We are grateful to the Yolda Initiative and Indian Pastoral Network for funding two papers each in this special issue. Engin Yilmaz, Pierre-Alexandre Paquet and Matthieu Salpeteur are thanked for helping us gain this support. This editorial was made possible with the help and efforts of numerous regional experts. A special thanks to Suraj Pratap Singh Bhati for his critical insights and comments on multiple drafts. We thank Aayushi Malhotra, Anita Sharma, Ishak Mohamed and Saloni Bhatia from India, Srijana Joshi and Gauri Dangol from Nepal, Kuenga Namgay and Kinley Gyaltshen from Bhutan and Muhammad Essa from Pakistan for their valuable insights. We thank Herman Kreutzmann for his support and for helping us understand pastoralism in Gilgit-Baltistan in great detail. Samuel Thomas and Saloni Bhatia are thanked for their exceptional support during the discussions. Rishi Kumar Sharma is thanked for his inputs at various stages of the special issue. Ian Scoones and Michele Nori are thanked for their guidance at the early stages of the editorial draft. A special word of thanks to Roy Behnke for his insightful comments and suggestions that improved the editorial substantially.

Authors' contributions
RS did the primary and secondary data analysis for documenting the pastoralism in the Himalayan region, synthesised the manuscripts of the special issue and wrote the manuscript. CK synthesised the manuscripts and wrote the article. Both authors edited and approved the final manuscript.

Authors' information
Rashmi Singh is an affiliate researcher at PASTRES, the Institute of Development Studies, University of Sussex. Rashmi has recently submitted her PhD thesis at the School of Human Ecology, Ambedkar University Delhi. She has been conducting empirical research on the entanglements between pastoral livelihoods, wildlife conservation and rangeland management in the Indian Himalayan region for over a decade.
Carol Kerven is a social anthropologist who has carried out research and development work for over 40 years among farmers and pastoralists in sub-Saharan Africa and Central Asia. Her main focus is on household economy and market engagement.

Funding
N.A.

Availability of data and materials
The data is available from the lead author upon reasonable request.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

Received: 26 July 2023 Accepted: 27 July 2023
Published online: 18 August 2023

References

Agrawal, A., and V.K. Saberwal. 2007. Whither South Asian pastoralism? An Introduction. *Nomadic Peoples* 8 (2): 36–53. https://doi.org/10.3167/082279404780446113.

Ahlers, R., J. Budds, D. Joshi, V. Merme, and M. Zwarteveen. 2015. Framing hydropower as green energy: Assessing drivers, risks and tensions in the Eastern Himalayas. *Earth System Dynamics* 6: 195–204. https://doi.org/10.5194/esd-6-195-2015.

Aryal, S., T.N. Maraseni, G. Cockfield, A. Suman, M.T. Narayan, and G. Cockfield. 2013. Sustainability of transhumance grazing systems under socio-economic threats in Langthang. *Nepal. Journal of Mountain Science* 11 (4): 1023–1034. https://doi.org/10.1007/s11629-013-2684-7.

Aryal, S., G. Cockfield, and T.N. Maraseni. 2018. Globalisation and traditional social-ecological systems: Understanding impacts of tourism and labour migration to the transhumance systems in the Himalayas. *Environmental Development* 25: 73–84. https://doi.org/10.1016/j.envdev.2017.09.001.

Ashraf, N., M. Anwar, I. Hussain, and M.A. Nawaz. 2014. Competition for food between the Markhor and domestic goat in Chitral Pakistan. *Turkish Journal of Zoology* 38 (2): 191–198. https://doi.org/10.3906/zoo-1306-6.

Bagchi, S., Y. Bhatnagar, and M. Ritchie. 2012. Comparing the effects of livestock and native herbivores on plant production and vegetation composition in the Trans-Himalayas. *Pastoralism* 2 (1): 1–16.

Baird, Timothy D., and Clark L. Gray. 2014. Livelihood Diversification and Shifting Social Networks of Exchange: A Social Network Transition? *World Development* 60: 14–30. https://doi.org/10.1016/j.worlddev.2014.02.002.

Barsila, S. R., N.P. Joshi, T.N. Poudel, B. Devkota, N.R. Devkota, and D.R. Chalise. 2022. Farmers' perceptions of grassland management in Magui Khola basin of Madi Chitwan, Nepal. *Pastoralism*, 12 (1). https://doi.org/10.1186/s13570-022-00243-7.

Behnke, R. H., and Mortimore, M. eds. 2016. *The end of desertification? Disputing environmental change in the drylands*. *Springer Earth System Sciences*. London: Springer. Retrieved from https://link-springer-com.proxy3.library.mcgill.ca/content/pdf/10.1007%2F978-3-642-16014-1.pdf.

Berger, J., B. Buuveibaatar, and C. Mishra. 2013. Globalization of the cashmere market and the decline of large mammals in central Asia. *Conservation Biology* 27 (4): 679–689. https://doi.org/10.1111/cobi.12100.

Bhasin, V. 2011a. Pastoralists of Himalayas. *Journal of Human Ecology* 33 (3): 147–177.

Bhasin, V. 2011b. Status of women in transhumant societies. *Sociology the Journal of the British Sociological Association* 2 (1): 1–22.

Bhasin, V. 2012. Life on an edge among the Changpas of Changthang. *Ladakh. Journal of Biodiversity* 3 (2): 85–129. https://doi.org/10.1080/09766901.2012.11884738.

Bhatnagar, Y.V. 2009. Relocation from wildlife reserves in the greater and Trans-Himalayas: Is it necessary ? *Conservation and Society* 6 (3): 263–270.

Bond, W.J. 2021. Out of the shadows: Ecology of open ecosystems. *Plant Ecology and Diversity* 14 (5–6): 205–222. https://doi.org/10.1080/17550874.2022.2034065.

Chatterjee, Shiba P. and Barry C. Bishop. Himalayas. *Encyclopedia Britannica*. 2023. https://www.britannica.com/place/Himalayas.

Chaudhari, A. 2000. Change in changthang: To stay or to leave ? *Economic and Political Weekly* 35 (1): 52–58.

Davies, J., and M. Nori. 2008. Climate change and livelihoods: Managing and mitigating climate change through pastoralism. *Policy Matters* 16 (October 2008): 127–162.

Dhakal, S., L. Srivastava, B. Sharma, D. Palit, B. Mainali, R. Nepal, P. Purohit, A. Goswami, G. Mohd Malikyar, and K. Wakhley. 2019. Meeting future energy needs in the Hindu Kush Himalaya. In P. Wester, A. Mishra, A. Mukherji, and A. Shrestha (Eds.), *The Hindu Kush Himalaya assessment: Mountains, climate change, sustainability and people* (pp. 167–207). Cham: Springer International Publishing. Retrieved from https://doi.org/10.1007/978-3-319-92288-1_6.

Dong, S., K. A. S. Kassam, J. F. Tourrand, and R. B. Boone. 2016a. Overview: Pastoralism in the World. In S. Dong, K.-A. S. Kassam, J. F. Tourrand, & R. B. Boone (Eds.), *Building resilience of human-natural systems of pastoralism in the developing world: Interdisciplinary perspectives* (pp. 1–36). Cham: Springer. https://doi.org/10.1007/978-3-319-30732-9.

Dong, S., L. Y. Shaoliang, and Zhaoli L.Yi. 2016b. Maintaining the human–natural systems of pastoralism in the Himalayas of South Asia and China. In S. Dong, K.-A. S. Kassam, J. F. Tourrand, & R. B. Boone (Eds.), *Building resilience of human-natural systems of pastoralism in the developing world: Interdisciplinary perspectives* (pp. 93–135). Cham: Springer. https://doi.org/10.1007/978-3-319-30732-9.

Dorji, P., and R. B Powrel. 2022. A pattern of livestock depredation by snow leopard to the yak herding pastoralist in western Bhutan. *Pastoralism*, 12 (1). https://doi.org/10.1186/s13570-022-00247-3.

Ehlers, E., and H Kreutzmann. 2000. *High mountain pastoralism in Northern Pakistan*. Germany: Franz Steiner Verlag.

Fratkin, E. 1997. Pastoralism: Governance and development. *Annual Review of Anthropology* 26: 235–261.

Galvin, K. 2009. Transitions: Pastoralists living with change. *Annual Review of Anthropology* 38 (1): 185–198. https://doi.org/10.1146/annurev-anthro-091908-164442.

Gongbuzeren, L. Huntsinger, and W. Li. 2018. Rebuilding pastoral social-ecological resilience on the Qinghai-Tibetan Plateau in response to changes in policy, economics, and climate. *Ecology and Society*, 23 (2). https://doi.org/10.5751/ES-10096-230221.

Gooch, P. 2009. Victims of conservation or rights as forest dwellers: Van Gujjar pastoralists between contesting codes of law. *Conservation and Society* 7 (4): 239–248. https://doi.org/10.4103/0972-4923.65171.

Hameed, A., M. Tariq, A. Buerkert, and E. Schlecht. 2022. Constraints and prospects of utilising mountain pastures in Gilgit-Baltistan, Pakistan. *Pastoralism*, 12 (1). https://doi.org/10.1186/s13570-022-00253-5.

Hashmi, M.M., L. Frate, S.M. Nizami, and M.L. Carranza. 2017. Assessing transhumance corridors on high mountain environments by least cost path analysis: The case of yak herds in Gilgit-Baltistan Pakistan. *Environmental Monitoring and Assessment* 189 (10): 1–9.

Hurbert, M., and J. Krishnaswamy. 2018. Risk management and decision making in relation to sustainable development. In *Climate change and land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and green house fluxes in terrestrial ecosystems*. *Intergovernmental Panel on Climate Change* 2019: 673–800.

Ingty, T. 2021. Pastoralism in the highest peaks: Role of the traditional grazing systems in maintaining biodiversity and ecosystem function in the Alpine Himalaya. *PLoS ONE* 16 (1 January): 1–19. https://doi.org/10.1371/journal.pone.0245221.

IPCC. 2019. Summary for Policymakers. In *Climate change and land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*, ed. Shukla PR, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D.C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, and J. Malley. Geneva, Switzerland: The Intergovernmental Panel on Climate Change (IPCC).

Joshi, S., L. Shrestha, N. Bisht, N. Wu, M. Ismail, T. Dorji, G. Dangol, and R. Long. 2020. Ethnic and cultural diversity amongst yak herding communities in the Asian highlands. *Sustainability (Switzerland)*, 12 (3): 1–25. https://doi.org/10.3390/su12030957.

Kala, C.P. 2005. A multifaceted review on the biodiversity conservation of the Valley of Flowers National Park, India. *International Journal of Biodiversity Science & Management* 1 (1): 25–32. https://doi.org/10.1080/17451590509618077.

Kassam, Karim-Aly S, Chuan Liao, and Shikui Dong. 2016. "Sociocultural and Ecological Systems of Pastoralism in Inner Asia: Cases from Xinjiang and Inner Mongolia in China and the Pamirs of Badakhshan, Afghanistan." In Building Resilience of Human-Natural Systems of Pastoralism in the Developing World: Interdisciplinary Perspectives, edited by Shikui Dong, Karim-Aly S Kassam, Jean Francois Tourrand, and Randall B Boone. Cham: Springer. https://doi.org/10.1007/978-3-319-30732-9.

Khanyari, M., S. Robinson, E.J. Milner-Gulland, E.R. Morgan, R.S. Rana, and K.R. Suryawanshi. 2022. Pastoralism in the high Himalayas: Understanding changing practices and their implications for parasite transmission between livestock and wildlife. *Pastoralism* 12 (1): 1–16. https://doi.org/10.1186/s13570-022-00257-1.

Krätli, S., C. Huelsebusch, S. Brooks, and B. Kaufmann. 2013. Pastoralism: A critical asset for food security under global climate change. *Animal Frontiers* 3 (1): 42–50. https://doi.org/10.2527/af.2013-0007.

Kreutzmann, H. (Ed.). 2012. *Pastoral practices in High Asia*. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-007-3846-1.

Kreutzmann, H. 2015. *Pamirian crossroads: Kirghiz and Wakhi of High Asia*. Wiesbaden: Harrassowitz, Ed.

Li, W., and Y. Li. 2012. Managing rangeland as a complex system: How government interventions decouple social systems from ecological systems. *Ecology and Society*, 17 (1). https://doi.org/10.5751/ES-04531-170109.

Luxom, N. M., R. Singh, L. Theengh, P. Shrestha, and R. K. Sharma. 2022. Pastoral practices, pressures, and human-wildlife relations in high altitude rangelands of eastern Himalaya: A case study of the Dokpa pastoralists of North Sikkim. *Pastoralism*, 12 (1). https://doi.org/10.1186/s13570-022-00252-6.

Malhotra, A., S. Nandigama, and K. S. Bhattacharya 2022. Puhals: Outlining the dynamics of labour and hired herding among the Gaddi pastoralists of India. *Pastoralism*, 12 (1). https://doi.org/10.1186/s13570-022-00237-5.

Mishra, C. 2001. *High altitude survival: Conflicts between pastoralism and wildlife in the Trans-Himalaya*. The Netherlands: PhD Thesis. Wageningen University.

Namgay, K., J. Millar, R. Black, and T. Samdup. 2013. Transhumant agro-pastoralism in Bhutan: Exploring contemporary practices and socio-cultural traditions. *Pastoralism Research, Policy and Practice* 3 (1): 13. https://doi.org/10.1186/2041-7136-3-13.

Namgay, K. 2014. *Transhumant agro-pastoralism in Bhutan: Does it have a place in the 21st century?* Charles Sturt University, New South Wales, Australia. Retrieved from https://dorjipenjore.files.wordpress.com/2019/11/transhumant-agro-pastoralists-of-bhutan-do-they-have-a-place-in-the-21st-century.pdf.

Nori, M. 2022. *Assessing the policy frame in pastoral areas of Asia. RSC Policy Paper 2022/04*. Firenze, Italy: PASTRES and Global Governance Programme.

PASTRES. 2023. https://pastres.org/biodiversity/.

Rao, A., and M. J. Casimir. 1982. Mobile pastoralists of Jammu and Kashmir: A preliminary report. *Nomadic Peoples*, *10*, 40–50. Retrieved from https://www.jstor.org/stable/43124001.

Rao, A., and Casimir, M. (Eds.). (2003). *Nomadism in South Asia*. Delhi: Oxford University Press.

Rautela, P., and B. Karki. 2015. Impact of climate change on life and livelihood of indigenous people of Higher Himalaya in Uttarakhand. *American Journal of Environmental Protection* 3 (4): 112–124. https://doi.org/10.12691/env-3-4-2.

Reid, R.S., M.E. Fernández-Giménez, and K.A. Galvin. 2014. Dynamics and resilience of rangelands and pastoral peoples around the globe. *Annual Review of Environment and Resources* 39 (1): 217–242. https://doi.org/10.1146/annurev-environ-020713-163329.

Sangay, T., and K. Vernes. 2008. Human–wildlife conflict in the Kingdom of Bhutan: Patterns of livestock predation by large mammalian carnivores. *Biological Conservation* 141 (5): 1272–1282. https://doi.org/10.1016/j.biocon.2008.02.027.

Schmidt, M. 2000. Pastoral systems in Shigar/Baltistan: Communal herding management and pasturage rights. In *High mountain pastoralism in northern Pakistan*, ed. E. Ehlers and H. Kreutzmann. Stuttgart: Steiner.

Scoones I. (Ed.). (2023). *Pastoralism, uncertainty and development*. Practical Action Publishing. https://practicalactionpublishing.com/book/2667/pastoralism-uncertainty-and-development.

Shah, S.I., I. Rahim, H. Rueff, and D. Maselli. 2012. Landless mobile pastoralists: Securing their role as custodians of northern Pakistan's mountains. Regional Workshop Islamabad, 24–26 April, University Bern Centre for Development and Environment.
Sharma, R.K., Y.V. Bhatnagar, and C. Mishra. 2015. Does livestock benefit or harm snow leopards? *Biological Conservation* 190: 8–13. https://doi.org/10.1016/j.biocon.2015.04.026.
Sharma, G., and L. K. Rai 2012. Climate change and sustainability of agrodiversity in traditional farming of the Sikkim Himalaya. *Climate change in Sikkim patterns impacts, and initiatives*, 1, 193–218. Forest and Environment Department. Government of Sikkim. Sikkim.
Sharma, A. 2011. *South Asian nomads--A literature review CREATE pathways to access. Research Monograph No. 58. University of Sussex: Centre for International Education*. Retrieved from http://eric.ed.gov/?id=ED519542.
Shrestha, R., and A.P. Wegge. 2008. Wild sheep and livestock in Nepal Trans-Himalaya: Coexistence or competition ? *Environmental Conservation* 35 (2): 125–136. https://doi.org/10.1017/S0376892908004724.
Singh, N.J., Y.V. Bhatnagar, N. Lecomte, J.L. Fox, and N.G. Yoccoz. 2013. No longer tracking greenery in high altitudes: Pastoral practices of Rupshu nomads and their implications for biodiversity conservation. *Pastoralism; Research, policy and practice* 3 (1): 1. https://doi.org/10.1186/2041-7136-3-16.
Singh, R., R.K. Sharma, and S. Babu. 2015. Pastoralism in transition: Livestock abundance and herd composition in Spiti. *Trans-Himalaya. Human Ecology* 43 (6): 799–810. https://doi.org/10.1007/s10745-015-9789-2.
Singh, R., R.K. Sharma, S. Babu, and Y.V. Bhatnagar. 2020. Traditional ecological knowledge and contemporary changes in the agro-pastoral system of Upper Spiti landscape, Indian Trans-Himalayas. *Pastoralism: Research, policy and practice* 10 (15): 1–14.
Singh, R., T.U. Bhutia, K. Bhutia, and S. Babu. 2021. Conservation policies, eco-tourism, and end of pastoralism in Indian Himalaya ? *Frontiers in Sustainable Food Systems* 5 (March): 1–11. https://doi.org/10.3389/fsufs.2021.613998.
Singh, R., K.S. Bhutia, T.U. Bhutia, and S. Babu. 2022. Rangeland conservation, pastoralist displacement, and long-term implications of a grazing ban in the Indian Himalaya. *Ecology Economy and Society the INSEE Journal* 5 (1): 195–221. https://doi.org/10.37773/ees.v5i1.335.
Srivastava, R. 2022. The making of pastoralisms: An account of the Gaddis and Van Gujjars in the Indian Himalaya. *Pastoralism*, 12 (1). https://doi.org/10.1186/s13570-022-00259-z.
Suryawanshi, K.R., Y. Veer, and B. Charudutt. 2010. Why should a grazer browse? Livestock impact on winter resource use by bharal Pseudois nayaur. *Oecologia* 162: 453–462. https://doi.org/10.1007/s00442-009-1467-x.
Vedwan, N. 2006. Culture, climate and the environment: Local knowledge and perception of climate change among apple growers in Northwestern India. *Journal of Ecological Anthropology* 10 (1): 4–18. https://doi.org/10.5038/2162-4593.10.1.1.
Verma, R., and M. Khadka. 2016. *Gender and pastoralism in the rangelands of the Hindu Kush Himalayas: Knowledge, culture, and livelihoods at the margins of the margins*. (R. Verma & M. Khadka, Eds.). Kathmandu, Nepal. Retrieved from http://lib.icimod.org/record/32249.
Vetter, S. 2020. With power comes responsibility – A rangelands perspective on forest landscape restoration. *Frontiers in Sustainable Food Systems* 4 (November): 1–10. https://doi.org/10.3389/fsufs.2020.549483.
Wu, N., M. Ismail, S. Joshi, S. Yi, R.M. Shrestha, and A.W. Jasra. 2014. Livelihood diversification as an adaptation approach to change in the pastoral Hindu-Kush Himalayan region. *Journal of Mountain Science* 11 (5): 1342–1355. https://doi.org/10.1007/s11629-014-3038-9.
Yamaguchi, T. 2011. Transition in mountain pastoralism: An agro diversity analysis of the livestock population and herding stratergies in southwest Tibet China. *Human Ecology* 39 (2): 141–154.

Publisher's Note