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EDITED BY
Andrei Dörre,
Freie Universität Berlin, Germany

*CORRESPONDENCE
Akanksha Tonk,
✉ akanksha90tonk@gmail.com

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Transhumance in transition: socio-economic shifts among semi-nomadic Gaddi tribe of Dhauladhar Himalayas

Akanksha Tonk* and Manvinder Kaur 

Department cum Centre for Women's Studies and Development, Panjab University, Chandigarh, India

The present study is exploratory in nature and aims to highlight the various issues and challenges of the transhumance profession practised by a semi-nomadic Gaddi tribe residing in the Dhauladhar Himalayas of District Chamba in the State of Himachal Pradesh, India. The inquiry employs a mixed methodology approach, operationalized through Interview Schedules, Focus group discussions, and an illustrative case study of a transgender person practicing transhumance since childhood. It aims to provide a distinctive perspective. Employing a Non-Random Quota Sampling technique, the study gathered data from a comprehensive sample of 80 research participants, including 50 practicing Gaddi herders and 30 key community experts, to ensure an in-depth analysis. The findings of the present study reveal that Transhumance is a vital socio-cultural practice that helps sustain biodiversity and rural economies, aligning with the various Sustainable Development Goals. However, this traditional livelihood is slowly declining, and more specifically among the Gaddis, threatened by factors including modernization, climate change hazards, increased infrastructure development, the tough nature of the profession, and socio-economic shifts reducing intergenerational participation. The study underscores the urgent need for inclusive and adaptive government policies to sustain this profession and calls for a targeted approach that includes Gaddi voices in decision-making, arguing that local problems always need local solutions.

KEYWORDS

issues and challenges, gaddi tribe, transhumance, semi-nomadic, climate change

Introduction

Transhumance is an ancient pastoral practice which is characterized by the seasonal movement of the livestock and their herders between fixed grazing ground. Transhumance is considered as one of the oldest forms of sustainable land use and play a significant role in maintaining biodiversity and preserving the socio-economic systems (Dyer, 2017). The to and fro movement of the herders along with the livestock is often influenced by climate conditions and ecological needs including the availability of fodder and grass for the herd. This system of migration represents a harmonious

relationship between the humans, nature and the animals. It is estimated that approximately 500 million people across 100 different countries in the world depend on this system for their livelihood needs. However, this figure is much larger because identifying these communities based on their mobility and variability is a difficult task. In many developing nations including India, Transhumance remains a crucial part of the rural economy and cultural identity. Transhumance has both economic and ecological benefits. An organization named League for Pastoral Peoples and Endogenous Livestock Development suggested that approximately 13 million people in India are dependent on the traditional pastoral activities, which in turn contributes approximately 3 per cent to the National Gross Domestic Product. The continuous movement of the herd helps to distribute manure that fertilizes the land, maintains ecosystems, and enriches soil fertility, altogether enriching the biodiversity. Livestock also acts as effective seed dispersal vectors which help certain plant species to adapt to changing climatic conditions. The Intergovernmental Panel on Climate Change (IPCC) also observes that the global rise in earth's temperature has severely effected the ecosystem leading to the extinction of some plant species (IPCC, 2022; Ayantunde et al., 2014; Shashi, 2006; Manzano et al., 2021; Krätli and Koehler-Rollefson, 2021; Gadgil and Malhotra, 1982; Rao et al., 2023; Davies and Hatfield, 2007). Integrating pastoral mobility into biodiversity programs align with the United Nations Sustainable Development Goals (SDGs), more particularly with SDG 13 (Climate Action), SDG 15 (Life on Land), and SDG 1 & 2 (No Poverty and Zero Hunger) by promoting climate adaptation, sustainable ecosystems, and livelihood resilience (Ratnadas et al., 2013).

Despite its significance, the system of Transhumance is slowly declining (Sharma et al., 2003). The impact of declining Transhumance could have multiple consequences for the pastoral communities especially in relation to the sustenance of their livelihood. Particularly impacted are the nomadic and semi-nomadic tribes such as the *Gaddis*, *Anwals*, *Bakarwals*, *Bhotiyas* in the Himalayas who follow Transhumance livelihood pattern.

For many years, these communities have played a major role in managing and sustaining the pastures of the Himalayas as economically productive systems (Sharma et al., 2022). Climate change in particular has intensified the pressure on the pastoral mobility (Aryal et al., 2014). Livestock herding is directly related to the timings of rain, grass production, agricultural seasons, snow melting in rangelands, and availability of water near grazing areas. These events become more sensitive to changes in climatic parameters. Increased temperature for instance changes the snow melting time and the phenology of plants grown in the range (Solomon et al., 2007).

Gentle and Maraseni (2012) suggest that climate change has effected the traditional knowledge system and the cultural practices of the people of Indian Himalayas and added to their burden. Particularly vulnerable to its impact are women and tribal people (Bhasin, 2013). Increasing conflicts, lack of

basic survival resources, as well as heavy dependence upon nature and natural resources makes tribal people even more vulnerable. The disproportionate impact is not merely due to inherent vulnerability but the result of inequalities in the political, social and economic realms which intersect with other axis of social disadvantage, such as race, sexuality, gender identity and disability status (Bhasin, 2004).

Many pastoralists struggle to sustain their livestock without access to the seasonal pastures which will eventually result in decreased health of the livestock and in turn less sale of the livestock in the market. This will create a situation of financial hardships for the communities. Simultaneously, it would lead to a decline in local dairy and meat production, which might lead to higher food imports and loss of the niche markets for the pasture fed products (Aryal et al., 2018).

The semi-nomadic lifestyle of the Gaddi tribe is influenced by the local ecology of the region (Singh and Kumar, 2014). This traditional practise is the backbone of their economy that helps sustain livelihood (Wagner A., 2013).

The journey of the Gaddi men towards *Dhars/Gahar* (grazing lands in the local language) often starts during the first week of April via trekking over mountain passes namely, *Loya* (3,243 m), *Jalsu* (3,469 m), *Bhuhar* (3,495 m), *Indrahar* (4,245 m), *Khoru* (2460 m) and *Chowari Jot* (3150 m) located between Districts of Kangra and Chamba in the State of Himachal Pradesh. After crossing and spending some time in these pastures (May and June), they travel to Lahaul District via some tough and steep mountain passes such as *Darati* (4,426m), *Kugti* (5,053m) *Chobia* (5,134m), *Kali Cho* (4,900 m), *Melwan* (4,200 m) (Table 1). Among these, *Kali Cho* pass poses a greater challenge for climbers as it features a steep gradient of approximately 75°. Additionally, the terrain is prone to natural calamities in the form of high wind velocity and sudden thunderstorms that can cause great loss to these migratory tribes (Chakravarty-Kaul, 1998).

The upward journey of the herders starts from the plains of lower Himachal including areas of Una (Basal, Daulatpur, Chintpurni) and Kangra Districts (Bajinath, Nagrota Nurpur, Lodhwan and Indora). Gaddi shepherds enter District Chamba via crossing over *Chowari Jot*, *Loya*, *Jalsu*, *Bhuhar* and *Indrahar mountain Pass*, subsequently they cross Chamba to Lahaul District over toughest mountain passes like *Kalicho*, *Chobia*, and *Kugti* to reach Lahaul valley (Figure 1). The downhill journey towards the low grasslands in plain areas begins during September. During this seasonal migration, the herders live in temporary shelters known as *Deras* (Dhiman et al., 2022). During this to-and-fro movement, they camp near their permanent houses while their livestock is kept in the adjoining forest areas. Gaddi men stay at their homes for a very short duration only, at times during ceremonial gatherings or during religious rituals or offerings to their local deities. This is also the recreational time for them to sit and relax, spend time with their families, and offer prayers to their local deities.

TABLE 1 Major mountain passes along the gaddis migratory route.

S.No.	Mountain pass	Elevation (m)	Location of the mountain pass
1	Chowari Jot	3,150	Between Kangra and Chamba
2	Khoru	2,460	Between Kangra and Chamba
3	Loya	3,243	Between Kangra and Chamba
4	Jalsu	3,469	Between Kangra and Chamba
5	Bhuhar	3,495	Between Kangra and Chamba
6	Melwan	4,200	Towards Lahaul District
7	Indrahar	4,245	Between Kangra and Chamba
8	Darati	4,426	Between Chamba and Lahaul
9	Kali Cho	4,900	Between Chamba and Lahaul
10	Kugti	5,053	Between Chamba and Lahaul
11	Chobia	5,134	Between Chamba and Lahaul

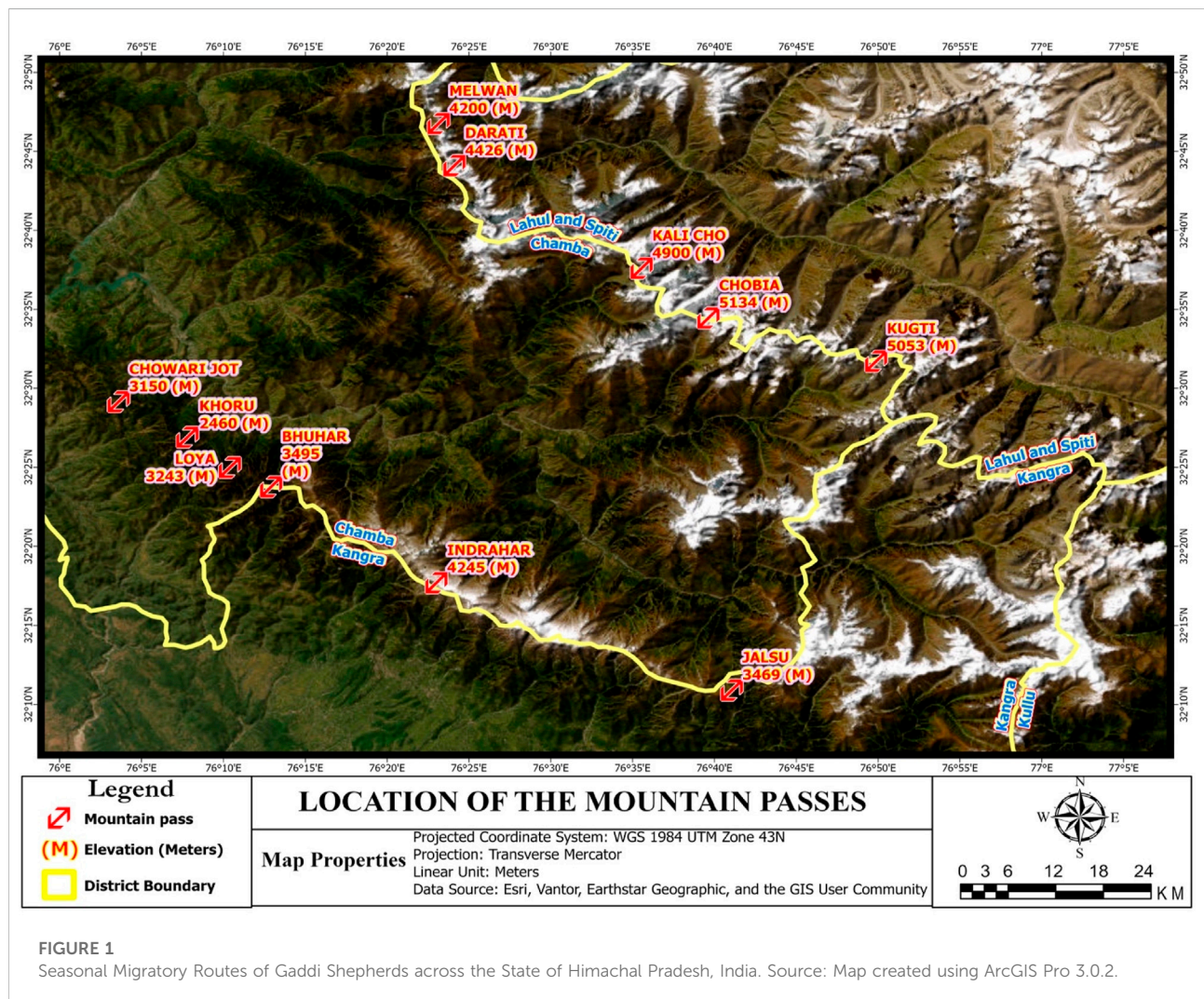


FIGURE 1

Seasonal Migratory Routes of Gaddi Shepherds across the State of Himachal Pradesh, India. Source: Map created using ArcGIS Pro 3.0.2.



FIGURE 2

Herd grazing on the grasslands near (Bandla village) helps in weeding out the shrubs and extra grass growing near the trees, fostering their growth.

In high-altitude areas, the movement of the herd helps in afforestation. For instance, while traversing over the mountains, the tribesmen along with their herd exert pressure on seeds and spawns which are deposited on the leaves of the plants. This phenomenon helps in fixing these seeds into the soil and thus helps in regenerating forests (Figure 2). Also, the process of herd grazing helps in weeding out the shrubs and extra grass growing near the trees, fostering their growth (Beckmann and Garzón, 2008).

The Gaddi derive their income mainly from the sale of livestock. The importance of the herd is evident in the terminology used for herd-“*Dhan*” (money) reflecting on the economic benefits obtained from selling livestock for meat and wool. This economic relationship is further demonstrated by the practice of animal shearing (Figure 3) which is conducted twice in a year. The sheep wool is usually sold in the local market or sometimes sold to the wool mark company. The wool which is produced by these local breed of the sheep are considered to be of higher quality and when sold, yields substantial economic returns to the Gaddis (Sharma et al., 2022). Beyond economic value, livestock also holds religious significance. Animal sacrifice to placate the deities though rare is still prevalent.

The Gaddi men travel through the same route making them knowledgeable about the ecosystems, the spatial distribution of resources, access to resources, and the use of resources (Sharma et al., 2003). During movement, they treat their livestock as

well as themselves based on their traditional knowledge on the use of resources (Thakur et al., 2016). However, the knowledge system is disrupted and the herders face challenges due to modernization, increased infrastructure development including the construction of roads and hydropower projects along their migratory routes. Climate change has posed severe challenges to this migratory system. Rising temperature leads to loss of vegetative cover, water scarcity, drought, and decline in flora and fauna. This has greatly impacted the pastoral land and altered the migratory routes of the herders (Malhotra et al., 2021).

According to the Gaddis, they now feel scarcity of fodder especially at lower altitudes and on their migratory routes. In the high altitude pastures, they now camp for a shorter duration at one single place and rotate camping grounds as compared to earlier times. Changing environmental conditions is also a factor directly affecting their migratory journey (Sharma et al., 2003). The herders pointed out that temperatures are now increasing while the snowfall is decreasing. These changing environmental conditions force changes in their migration timings and at times result in the mortality of livestock.

Further, natural disasters such as landslides and heavy downpours add to the losses and challenges. Another factor in this category is the reduced availability of water. Most of the natural sources of water are drying up. Therefore, Gaddi men have to travel longer distances for alternative sources of water. All



FIGURE 3

Animal shearing often conducted twice a year.

these impact the health of the livestock as well as the herders (Ramprasad et al., 2020a). Lack of health facilities at the high alpine areas makes them even more vulnerable to disease. While Gaddis are knowledgeable and able to treat common diseases using natural resources, emergencies become fatal (Sharma et al., 2022).

Without adequate institutional support to cope with emerging plantation-related and historical drivers of livelihood change, pastoralism is made vulnerable, pushing Gaddis toward other alternate livelihoods and threatening ecological balance (Ramprasad et al., 2020b).

The present research highlights the significance of the Transhumance profession and explores the challenges of the transhumance profession among the semi-nomadic Gaddi tribe of the Dhauladhar Himalayas from two different perspectives: the Gaddi herders who practice Transhumance and the experts or persons from the community who are familiar with this practice of Transhumance. The perspectives of Gaddi herders and experts gives a holistic understanding of the Transhumance system.

Materials and methods

Study area

In India, the state of Himachal Pradesh is divided into twelve administrative districts (Figure 4). The entire District of Kinnaur, Lahaul-Spiti and two tehsils of Chamba District (Bharmour & Pangi) form the Scheduled Area in the state, fulfilling the

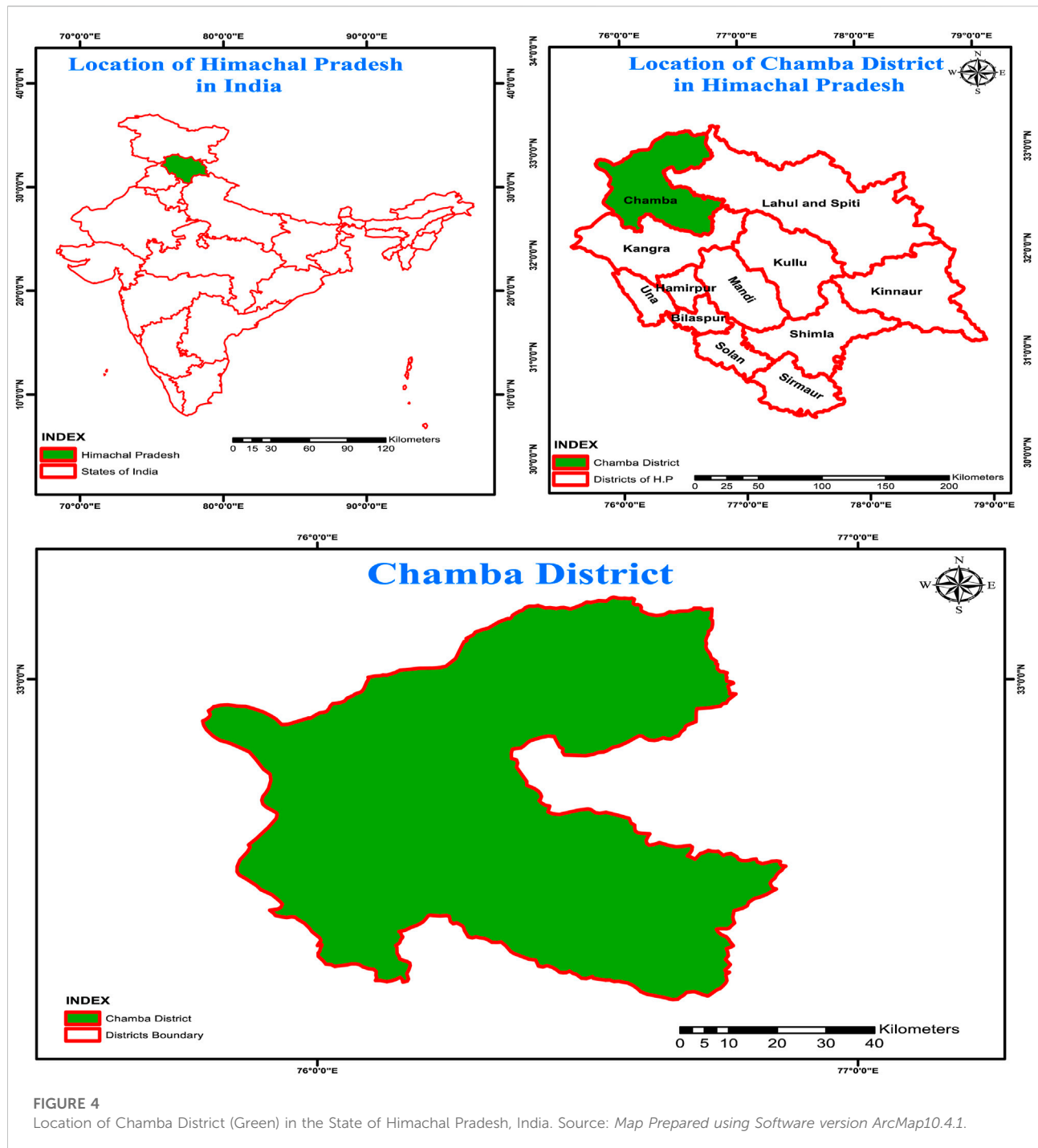
minimum criteria of fifty per cent Scheduled Tribe population. The Gaddis, who were residing in the Bharmour area of Himachal Pradesh, were designated as Scheduled Tribe (ST) at the first constitutional tribal scheduling in 1950, whereas settled Gaddis of Kangra region were given the ST status in 2003.

Chamba is one of the unique geographical entities of the country wherein climate ranging from tropical to temperate and even alpine is simultaneously present. The vast meadows and grazing pastoral lands makes it ideal for sheep and goat herding, which is the major occupation of Gaddi tribe of this region.

In the year 2006, the Ministry of Panchayati Raj declared Chamba as one of the country's most backward districts. The District receives funds from the Backward Regions Grant Fund Programme in the form of financial aid. It is one of the twelve Aspirational Districts (Backward Districts) of the country and part of NITI Aayog led Aspirational District Programme (ADP)¹ which was launched by Government of India in the year 2018 (Sarkar et al., 2022).

Among the three tribal groups of the State, the Gaddi tribe has a sizeable population in the region.

1. ADP effectively transform the most under developed regions of the country through three "C" policy i.e., Collaboration (Central, State level, Nodal Officers & District Collectors), Convergence (Central and State schemes) and Competition among the districts. The programme uses 49 key performance indicators under five broad socio-economic themes including Health and Nutrition, Education, Agriculture and Water resources, Financial Inclusion and Skill Development and Infrastructure (Sarkar et al., 2022).



Research design

The present study is exploratory in nature and analyses the various issues and challenges of Transhumance profession practiced by Gaddi herders of Chamba region along with the livelihood challenges of Gaddi community from the perspectives of Knowledgeable persons.

Sampling

The study employed Non-Random Quota Sampling technique to obtain a comprehensive sample size of 80 (Gaddi men, women and community experts) from District Chamba. The composition of the sample was explicitly designed to provide an in-depth analysis of the research objectives. Sample size

includes 50 Gaddi men who are practising Transhumance and 30 key informants/knowledgeable persons, selected on the basis of their availability and the knowledge they possess regarding the Gaddi tribal community and system of Transhumance. In addition, a unique case study of a 72 year old transgender person who have been practising Transhumance since a very long time is also highlighted.

Data collection

The data for the present study was conducted over a year spanning several months in 2021 (September, October, November and December) and 2022 (January and February). The present study used a mixed methods approach including both qualitative and quantitative approaches for data collection. The use of mixed methods approach helps to enhance the robustness and validity of the research findings as compared to using one methodological approach. The primary data was collected using Interview schedule and focus group discussions. Interview schedule was pre-tested and modified accordingly before being finalized.

Since Gaddi herders are constantly moving with their livestock through mountain passes, conducting interviews during the migration was challenging. Therefore, some of the Gaddi men were interviewed when they stayed at lowland pastures, where the duration of their stay varied from three to 4 months. For many, the interviews were conducted during their stay at summer/highland pastures in Lahaul valley. The interviews were conducted in several locations near areas of Basal, Daulatpur, and Chintpurni in Una District, as well as areas near Nurpur, Indora, and Baijnath areas in Kangra District.

As the research was conducted in a non-invasive manner (interviews and focus group discussions), informed consent of the participants was taken prior participating in the study and was secured, and interactions took place in research participant's natural settings without involvement of any institution. Formal ethical clearance may not be obligatory for the present study.

Data analysis

The primary data collected in the form of narratives was thoroughly screened and transcribed before the data tabulation. Major findings, and methods were extracted into a Microsoft excel spreadsheet. Common themes were highlighted and coded to contextualize the findings. The primary data was analysed, and per cent age, frequency, ratio data was plotted in gg plot2 package (v-3.4.1) of R.

Results

The findings of the present study highlight the key issues and challenges encountered by Gaddi herders during their migratory

routes along with various factors that contribute to the decline of decreasing Transhumance profession among the younger generation. In addition to this, the insights of the Knowledgeable persons or community experts about the livelihood concerns of the Gaddi community are discussed.

During data collection, a unique case of a Transgender person from Malkauta village who has been practising Transhumance since childhood was documented. The case sheds light on the specific challenges encountered faced by Transgender person in this traditional livelihood.

In the present study, the Gaddi pastoralists exemplify the traditional lifestyle, and face greater challenges along their migratory routes.

The issues and challenges faced by the Gaddi men during migration, their opinion regarding the decreased nature of the Transhumance profession among the younger generation, and expectations from the Government to support their livelihood are discussed.

The tables and histogram present the socio economic profile of Gaddi men including age (Table 2), educational qualification (Table 3) and total workers and number of herd and income (Figure 5). Following this, broader issues including difficulties in Transhumance (Figure 6), Gaddi men opinion on decreasing Transhumance (Figure 7), reasons for decreasing Transhumance among youth (Figure 8), and Government help to ease livelihood (Figure 9), etc. also discussed.

Age

The age of Gaddi men respondents varied between 35–80 years with the youngest Gaddi man at 35 years and oldest at 80 years. 22 per cent of the respondents were between 51–55 years of age. 16 per cent of the respondents were between the age of 35–40 years, 12 per cent between the age of 46–50 years, 10 per cent each between 56–60 and 61–65 and 76–80 years respectively. 8 per cent of the respondents were between 71–75 years. Further, 6 per cent of the respondents each were between 41–45 and 66–70 years respectively (Table 2).

It must be noted that the age of the youngest man was 35 years. This indicates a generational shift in livelihood preferences among the Gaddi tribe. The age distribution suggests that the youth are moving away from this traditional practice of Transhumance while the older men continue to maintain this practise. A 76- year-old Gaddi man from Bandla village stated that, *"I cannot leave this profession, if I leave this profession, I may not live long."* This was the common view of majority of the older men who were still practising the Transhumance profession. One of the respondents stated that *"Only death will make us apart from this profession."*

It also indicates broader socio-economic changes within Gaddi community where the youth are seeking alternative

TABLE 2 Distribution of gaddi men respondents by age group.

S. No.	Age group	Number of respondents	Percentage (%)
1	35–40	8	16.0
2	41–45	3	6.0
3	46–50	6	12.0
4	51–55	11	22.0
5	56–60	5	10.0
6	61–65	5	10.0
7	66–70	3	6.0
8	71–75	4	8.0
9	76–80	5	10.0
		Total: 50	100.00

TABLE 3 Distribution of gaddi men respondents by educational qualification.

S. No.	Educational qualification	Number of respondents	Percentage (%)
1	Illiterate	35	70.0
2	Primary (I-V)	9	18.0
3	Matric	5	10.0
4	Graduation	1	2.0
		Total: 50	100.0

livelihood options possibly due to modernization and challenging nature of Transhumance.

on the economic conditions of the herders and their families. The larger the head count, the more is the income

Educational qualification

In the present study, 70 per cent of the Gaddi men were illiterate and 18 per cent had received primary education. 10 per cent of the men were matriculate. Only 1 respondent was a graduate. This was a 38 year old Gaddi man who holds a Bachelor's degree in Arts. Despite having formal education, he faced limited employment opportunities and was offered low paying positions like store helper, cleaner, etc. The unfavourable job prospects made him follow his father's Transhumance profession. This example illustrates that traditional pastoral practice can also serve as a viable economic alternative to underemployment in job market. Simultaneously, it also challenges the assumption that education leads to abandonment of traditional occupations.

Total herd and total workers

The head count of the herd and total workers hired for the care and maintenance of the livestock is a crucial aspect reflecting

Difficulties during migration

In the present study, 90 per cent of the Gaddi men had faced difficulties due to extreme weather conditions, 70 per cent stated difficulty with herd theft, 54 per cent reported wild animal attack as the major difficulty in the profession. 46 per cent of the Gaddi men stated difficulty with new born lambs, 24 per cent stated difficulty in telecommunication contact with their family members. Health issues were stated by only 20 per cent as being a challenge during migration.

Extreme weather conditions in the form of heavy snowfall, rains, flash floods, high-altitude mountain passes, etc., pose great challenges for the Gaddi men and their herd. At times, during snowfall on their migratory route, the movement of the herd is halted. During this time, the men are unable to cook and eat food for days. They mostly rely on dry food items like *Sattu* and *Moa* (mix of wheat flour and some clarified butter). The majority of Gaddi men also stated that they have remained hungry for days because of the limited food. These men are stranded in one place for days without food, water, and shelter.

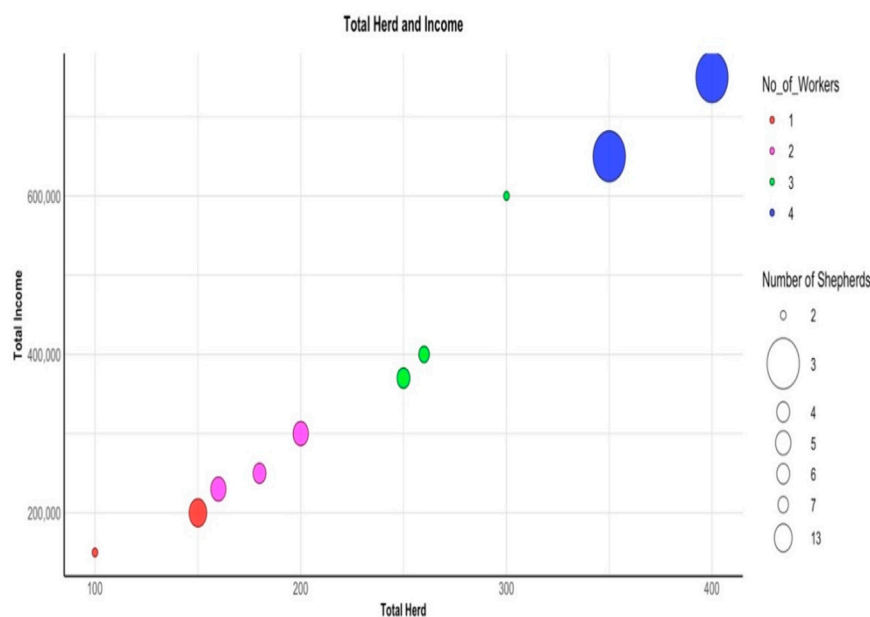


FIGURE 5

Distribution of Gaddi Men Respondents by Total Herd and Total Workers. The bubble plot shows the relationship between total herd size and total income of the 50 Gaddi men respondents. The plot reveals that as the herd size increases, the total income also increases. Gaddi men with larger herds tend to earn more money. The bubble size represents the number of herd with each Gaddi shepherd. Each bubble represents a different herd size which varies from 100 to 400 animals. The number of shepherds varies from 2 to 13. 2 respondents had herd size of 100, 3 respondents each had herd size of 350 and 400, 4 respondents had a herd size of 250, 5 respondents each had herd size of 200 and 160, 6 respondents had herd size of 180, 7 respondents had a herd size of 260, 13 respondents had a herd size of 150. The bubbles are colour coded and represent the number of workers (Red denotes 1, Pink 2, Green 3 and Blue 4).

During heavy snowfall, the herd is sometimes diverted back to a safe place until the snowfall ceases. During this period, difficulty in walking over the snow and limited grass for the herd accounts for a greater mortality rate among the goats and sheep. Sometimes, the snow glaciers need to be cut using a sharp axe to make a narrow passage for walking. This may take several days which is exhausting both for the men as well as their herd. According to one of the respondents, one hundred and fifty sheep and goats were buried under an avalanche while crossing the *Kalicho Pass* in the year 1997. This caused great monetary loss to him. The memory of the incident still haunts him.

In another incident in the year 1992, as stated by an old Gaddi man from Bandla village, “Due to heavy snowfall on the *Kalicho Pass*, I had to divert my herd back. However, on reaching the nearby base camp, the herd could not cross to the other side of the valley because of a flash flood. I along with my workers, stayed at one place for 4 days without any food, shelter and water. Later on, when the rain stopped, we managed to build a temporary bridge of wooden logs and made way for the herd to cross the river one by one.” He recalled that it was the most challenging and tough time for everyone. The man was continuously praying to his local deities to give him strength and power.

In addition, herd theft is another problem faced by Gaddi men during Transhumance. The Gaddi men often traverse through remote and rugged terrain, which makes it challenging to monitor the livestock effectively. The temporary nature of their shelters and the movement of the herd during night time provides an opportunity for the thieves to steal the livestock. One of the respondents stated that, “while returning from *Lahaul* to *Kangra* in 2005 during summers, effective monitoring of the herd was not possible due to darkness at night. The thieves got an opportunity and took away 20–25 goats which were moving at the end.” According to him, “he suffered significant financial loss as one adult goat costs approximately Rupees 20–25k if sold in the market.” Additionally, the emotional attachment to the animals is above everything else is observed by another respondent.

Transhumance involves long journeys through rough mountain terrains. At times, the newly born lambs or diseased adult, mostly weak and vulnerable are carried on the shoulders. This is physically demanding and exhausting for the lambs and the Gaddi men. In the event of extreme temperature and precipitation, newborn lambs are vulnerable to cold and damp conditions, which can cause hypothermia and other health issues. Additionally, due to lack of food and nutritional grass, ensuring adequate nutrition becomes a challenge. Moreover, newborn

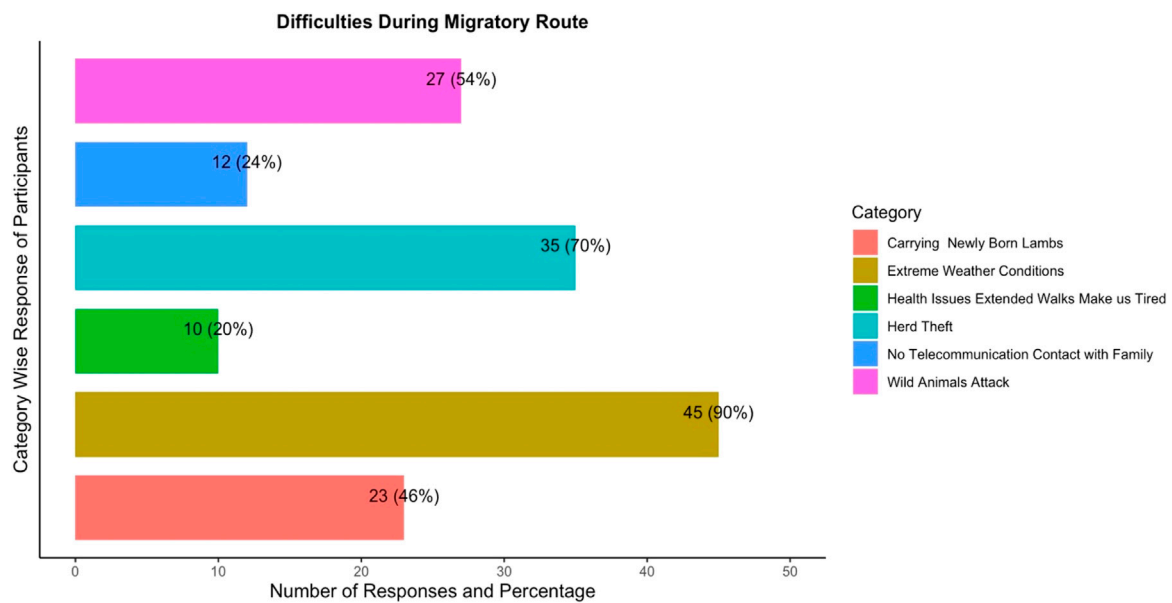


FIGURE 6
Distribution of Gaddi men respondents by difficulties faced during migration.

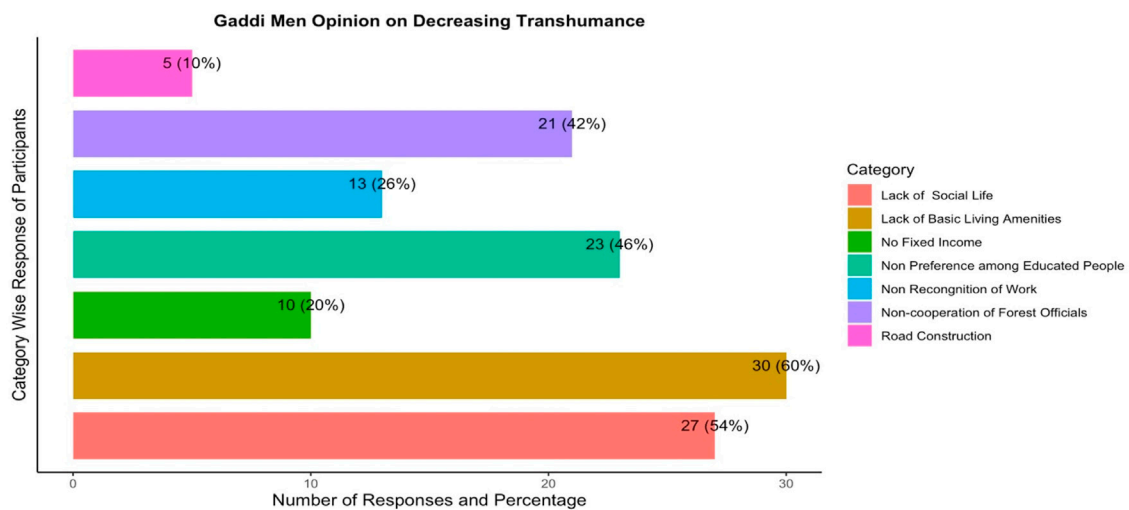


FIGURE 7
Distribution of Gaddi men respondents regarding opinions on decreasing transhumance.

lambs are separated from their mothers. This can cause distress and desertion for newly born lambs who rely on their mothers for milk.

The movement of Gaddi men with their livestock through forest areas inhabited by predators such as brown bears, foxes, etc. increases the chances of attack on their herd. Wild animals often perceive the presence of humans and livestock as a threat to

their territory or offspring. This might provoke defensive behaviour of wild animals, resulting in attacks on humans and the herd. In year 1999, two Gaddi men were attacked by a Grizzly bear while saving their livestock. The men were gravely injured and later admitted to the nearby hospital. In another incident in the year 2019, as stated by one of the men, “While I was sleeping in an open area of the jungle at night, a brown bear attacked the herd

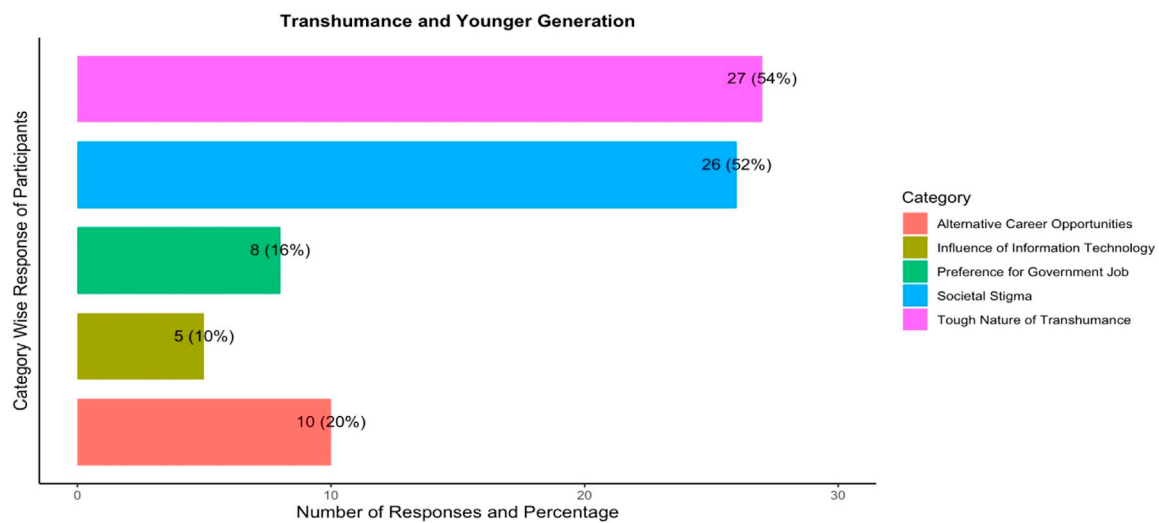


FIGURE 8

Views of Gaddi men respondents on decreasing transhumance among younger generation.

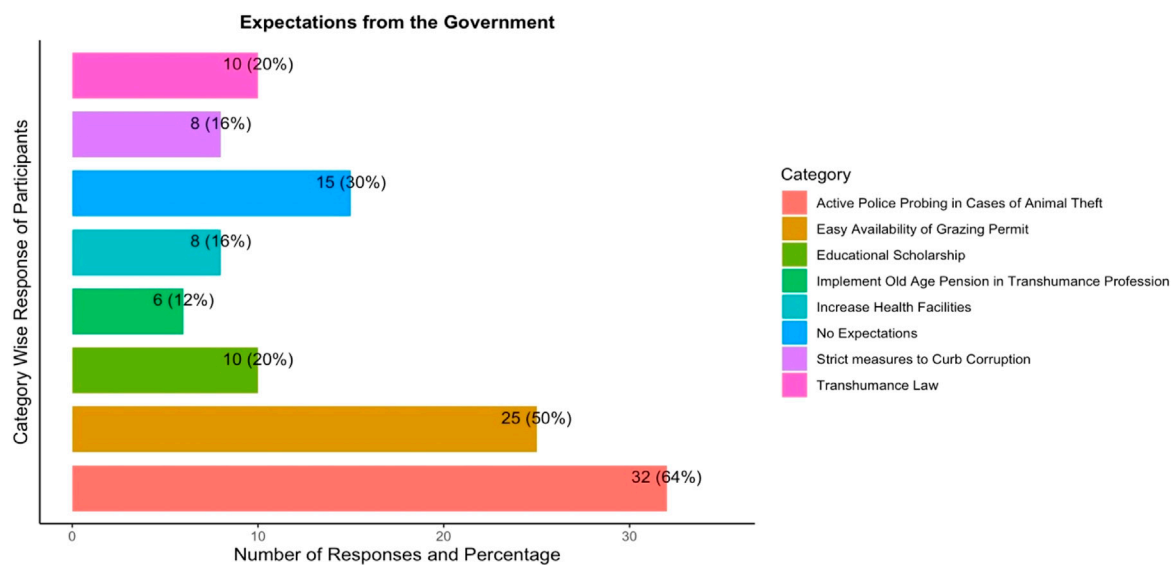


FIGURE 9

Expectations of gaddi men respondents from the government.

and killed two goats. The animals were only frightened by flaming torches.”

Transhumance also poses challenges when it comes to telecommunication. The higher altitude areas lack mobile signals. Rugged topography and extreme weather conditions, etc., create difficulties in establishing and maintaining mobile communication infrastructure. The Gaddi men are not able to contact their families back home. According to one of the respondents, “I received the news of my eldest son’s birth after

a month when some villagers visited me.” Another respondent stated that, “My mother died and I was not able to reach for cremation as it would have taken 3 days to reach the village. The body could not be kept for long. I still regret this incident and I always feel bad about it.”

The constant movement of the men along with the livestock on rough and mountainous terrain is also mentally and physically exhausting. This constant movement and physical activity can make them feel fatigued especially if the

movement is combined with carrying equipment and other essentials.

However, despite the difficulties associated with Transhumance, older Gaddi men view it as an essential and rewarding aspect of life which is often inseparable from them. The closeness of the Gaddi pastoralists with their natural environment, the sense of tradition and community, and the love for the animals often outweigh the physical and mental demands of the journey.

Gaddi men opinion on decreasing transhumance

In the present study, 60 per cent of the respondents stated lack of basic living amenities followed by 54 per cent who stated lack of social life as the major contributing factor for the decreased nature of Transhumance. Other factors included non-preference among educated youth which was cited by 46 per cent, non-cooperative attitude of forest officials stated by 42 per cent. 26 per cent stated non recognition of their work. 20 per cent stated that there is no fixed income in Transhumance. Further, road construction along the migratory routes was stated by 5 per cent of the respondents as a reason for decreasing Transhumance.

Due to the constant movement of the herd on rough mountainous terrain, it becomes very difficult to carry beddings, food items, etc. Only basic food items are carried including cooking oil, salt, turmeric powder, lentils, rice, sugar and tea leaves, etc. Moreover, access to fresh food and dietary necessities are also limited. Thus, the herders rely on their livestock for food and milk. Their diet includes *makki roti* (corn bread) consumed with raw goat milk.

Lack of sanitation facilities including open defecation poses increased risk to their lives. It is associated with greater risk of attacks by wild animals on humans during night. Similarly, their stay in temporary shelters or tents may not always provide sufficient protection from the harsh weather conditions especially during snow or monsoon rains. As is stated by one of the respondents, *“in the year 2002, due to heavy rainfall that lasted for 2 days, food, bedding and clothes were drenched in rain water.”* In another incident, *“because of extreme cold and improper bedding and quilts, I experienced high fever and was admitted to the local hospital.”* However the exact diagnosis is not known to the respondent. Many Gaddi men also stated that *“we are not able to sleep properly as the beddings are made of a thick layer of hay grass covered with a cotton sheet and the tents are usually open from two ends leading to discomfort during night.”* Reiterating it further a 68 year old Gaddi man continued that, *“Gaddi ki toh juin hi buri hai”* meaning Gaddi people's livelihood is full of difficulties and obstacles. Gaddis are born and will eventually die like this.

Most of the herders also feel socially and emotionally isolated from their families. As is stated by a 45 year old Gaddi man, *“I often miss my family a lot. I miss not being able to talk to my children because of lack of mobile signals. The moment there is a mobile signal on my way, I immediately video call my family at home.”* He also recalls that, *“When I was a child, I used to accompany my father on migration. My father had no mobile phone. My father used to feel isolated and miss my mother and sister a lot. He used to talk to them only after he visited home.”* A 70 year old Gaddi man stated that, *“Mann ko kaida karna padhta hai”* meaning “I do miss my family, friends and grand-children back at home but we have no other option.”

The respondents also stated that, *“many educated young boys in their own families do not want to continue with Transhumance as a career option.”* Educated youth are more interested in pursuing a career which offers them more stability in terms of income and comfort. On the other hand, a 70 year old respondent reveals that, *“my son is a graduate but could not find a decent job thus he was forced to continue with Transhumance as a profession”.*

For many, the non-cooperative attitude of the forest officials in granting forest permits and unnecessary interventions of the forest guard in certain areas is one of the contributing factors for decreasing Transhumance. *“Forest officials take bribe from us in lieu of forest permit,”* stated a 56 year old Gaddi man.

Deforestation and road construction along the migratory route poses serious challenges to the herders. Deforestation leads to decreased availability of suitable pastoral lands as certain forest areas are often converted into commercial areas. This impacts the livestock which solely depends on forage for nutritional value. The construction of roads is often viewed as a positive indicator of development but in case of herders who practise Transhumance, roads pose certain challenges because of their hindrance with the mobility of the livestock. *“The goats and sheep are not meant for walking on concrete rather they prefer earthy surface”* is a view of an old Gaddi man.

The above findings align with the observations of multiple researchers over the past few decades. The researchers including Rawat (1980), Gaston (1981), Pillimore (1984), Tucker (1987), Bhasin (1988), Saberwal (1999), Mukherjee (1994), Axelby (1995), Kaul (1998), Wagner J. (2013), Malhotra (2020) and Negi (2021) have noted a consistent decline in pastoral practices among the Gaddi community. The consistent evidence from these different studies suggests that the pastoral lifestyle and practices of the Gaddis have been gradually diminishing due to the changes brought about by development initiatives on their lands.

It must be highlighted that in the study area, the younger men who are practicing Transhumance are very few. Thus it becomes

more crucial to highlight the decreasing nature of the Transhumance among the younger generation from the perspectives of those gaddi men who are still practicing.

Gaddi men views on decreasing transhumance among younger generation

Gaddi men have different opinions regarding the non-preference of Transhumance as a career option among the younger generation. The multiple responses highlight that the tough nature of Transhumance as a profession is a major contributing factor.

Tough nature of Transhumance and societal stigma among the younger generation including accusations of being “too soft” or lacking the strength and resilience required for the demanding Transhumance lifestyle and community judgment for prioritizing individual comfort over cultural identity; these were the major reasons for not opting for the profession, accounting for approximately 54 per cent and 52 per cent respectively. Further, alternative career opportunities accounts for 20 per cent, preference for government jobs accounting for 16 per cent, influence of information technology accounts for 5 per cent of the responses.

The constant migration of the herd from one place to another can be challenging and exhaustive in itself. The younger generation lacks emotional connectivity with the animals. Many respondents stated that, *“to take care of the animals, one has to become like them.”* During migration, every day is a challenge and one has to be ready for every difficulty. Many view the younger generation as not responsible enough to handle the difficulties. Simultaneously, the youth see Transhumance as a primitive practice and feel shy to disclose their identity as a herder. A narrative of one of the Gaddi men reveals that his 27 year old son *“feels guilty and shy to discuss with his friends that he accompanies his father during migration.”* Furthermore, those young people who are involved in this profession, also face judgements from their peer group who adhere to more settled lifestyle and occupations. As stated by one of the respondents, *we shepherds are considered as bhed palak who lack civic sense. We are considered as unhygienic for not taking regular baths.*

Additionally, young people may also perceive this profession as a barrier in accessing educational opportunities which restricts their career options and upward mobility. There is also a common view point among majority of the respondents that *“if one has to master the skills and practise of Transhumance, one has to engage in it since a very small age as it requires a lot of patience and skill learning.”* Additionally, this profession is also viewed as restrictive among the youth who prefer freedom. According to a 70 year old respondent *“youth are more interested in fatti jeans”* meaning, younger generation is more inclined into fashion.

Additionally, it was also found that there is a generational gap between the older generation, who values and upholds their

beliefs in shepherding and the younger generation, who distance themselves from the primitive customs and traditions in favour of more modern ideas. Furthermore, the youth are inclined more towards the social media practices like uploading videos, making reels and vlogging. Further, lack of mobile signals throughout the journey creates a state of boredom among the youth who prefer more sedentary and comfortable life above all.

It must be noted that the respondents have given multiple responses, thereby the percentage was calculated by combining multiple responses with a total number of respondents ($n = 50$). The responses regarding expectations from the Government range from primarily focusing on easing the Transhumance profession to more generalized measures to improve the livelihood of Gaddi tribal people in general.

64 per cent of the respondents seek active involvement of the state police department in cases of animal theft. 50 per cent wanted help in easy availability of grazing permits from the forest departments. Educational scholarship for their children and formation of a separate law on Transhumance was demanded by 20 per cent of the respondents each, 16 per cent demand strict measures to stop corruption and 16 per cent want increased health facilities. A mere 12 per cent of the respondents demanded for old age pension scheme for the herders while 30 per cent of the respondents have no expectations from the Government.

For herders, their livestock is of prime importance because of the emotional bonding with their herd and the monetary benefits they receive from the sale of their livestock helps in sustaining their livelihood and economy.

One of the respondents stated that, *My twenty five sheep were stolen during the night. When I complained, the police officials did not write down the complaint.* On insistence, the official misbehaved with me. The police official told him, *“Hamara kaam bhed bakriyan dhundna nai hai, aur bhi kaam hai hume”* (Our responsibilities extend beyond searching for your lost herd). Further, one of the respondents claimed to have lost ten goats and when he complained, the police officials were reluctant to probe into the case stating *“Yeh inka roz ka kaam hai, koi na koi chala hota hai thane mein”* (It has become an everyday affair, daily there is some or the other Gaddi man complaining regarding theft). He further stated that, *“we (herders) are not even recognized for our work and considered as unhygienic.”*

Many respondents also seek implementation of strict measures against the authorities who take bribe. The non-cooperative attitude of the forest officials in granting the grazing permit is another challenge for the herders. *Yeh hamari jagah hai, sarkar ne yeh hamare naam pe di hai dhan charane ke liye aur iske badle ham inhe paise dete hain* is stated by a 70 year old Gaddi man. (This place is ours, the Government has granted this land for grazing our animals and *in lieu* we pay them annual tax). He further stated that some of the forest lands have been commercialized to be used by the private sector for economic benefits. *“Large areas of my permitted pastoral land were converted into non-grazing areas.”* Reiterating this, one of

TABLE 4 Distribution of Knowledgeable Persons by age group.

S. No	Age group	Number of respondents	Percentage (%)
1	30–35	1	3.33
2	36–40	1	3.33
3	41–45	1	3.33
3	46–50	3	10.00
4	51–55	4	13.33
5	56–60	3	10.00
6	61–65	5	16.66
7	66–70	3	10.00
8	71–75	7	23.33
9	76–80	2	6.66
		Total: 30	100.00

the respondents opines that, “forest officials seek money in return for granting permit.” He further stated that, *our ancestors have been grazing livestock on these lands since a very long time.*

Increase in health and educational facilities in Chamba region is also the common expectations among the respondents. In areas that are at a distance from the Chamba Regional Hospital, many respondents complain about lack of hospital infrastructure in and around their villages. As is stated by one of the respondents from a village near Bharmour, “*There is no primary health centre in my village and villagers have to travel approximately 60 km to reach Chamba Hospital. In case of health emergency, it is challenging to transport the patient.*” There is also a dearth of hospital staff and physicians in some Primary Health Centres, etc.

The challenges encountered by Gaddi men during the migratory route are multifaceted, encompassing not only environmental obstacles but socio-economic and cultural pressures. As these pastoralists navigate an increasingly volatile landscape, the sustainability of their traditional lifestyle comes into question. The situation necessitates a comprehensive examination of interplay between environmental change, cultural preservation, and economic sustainability in the context of nomadic Transhumance in Indian Himalayas.

Knowledgeable persons and transhumance

In order to identify the potential gaps regarding Transhumance profession and its associated difficulties, it becomes pertinent to incorporate the views of other community members particularly of those who have expertise and knowledge regarding the Transhumance profession.

Knowledgeable persons or key informants are the individuals who have in-depth knowledge and experience in a particular field

or topic that provides valuable information and insights. In the present study, knowledgeable persons or key informants included both Gaddi men and women from different villages.

The demographic factors including age, gender, educational qualification and occupation of the knowledgeable persons helps to evaluate the reliability and representativeness of their opinions while simultaneously providing a range of perspectives of their understanding of the Gaddi tribal community.

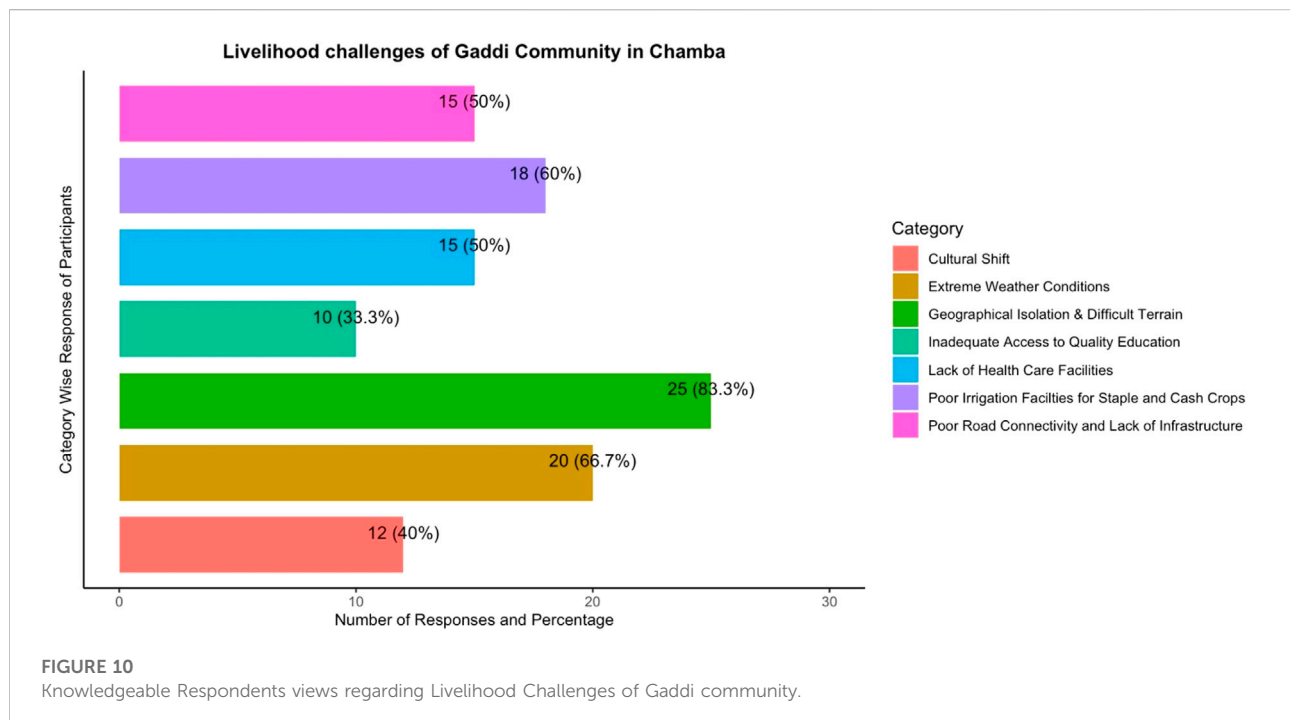
The table below distributes knowledgeable respondents on the basis of age (Table 3), educational qualifications and occupation (Table 4) and Knowledgeable Respondents views regarding Livelihood Challenges of Gaddi community (Figure 10).

Knowledgeable respondents by age group

The age of Knowledgeable persons varied between 35–80 years of age. The age of youngest respondent was 35 years and the oldest respondent was 80 years. 23.33 per cent of the respondents were between 71–75 years of age, 16.66 per cent of the respondents between 61–65 years of age, 13.33 per cent between the 51–55 years of age, 10 per cent each between 46–50, 56–60 and 66–70 years of age respectively. 6.66 per cent of the respondents were between 76–80 years of age. 3.33 per cent of the respondents were between the age group of 30–35, 36–40 and 41–45 years of age respectively.

Educational qualification and occupation of the knowledgeable respondents

In the present study, 33.33 per cent of the respondents were illiterate and were involved in varied occupations like farming, temple priest and a housewife followed by 23.33 per cent who



were graduates, including ex-army personnel, journalist, junior engineer and school teacher. 13.33 per cent of the respondents have completed their education till 5th and 10th class and were involved in different occupations like priest, village Pradhan (Village head), farmer and shopkeeper, etc. Further, 3.33 per cent of the respondents each have passed their higher secondary, hold an I.T.I diploma, Masters in English, Ph.D (Doctorate of Philosophy) and PDF (Post-Doctoral Fellowship) in sciences, Member of legislative Assembly (MLA) as well as Neuro Surgeon from Bharmour constituency (Table 5).

Many of the educated individuals from the study area, including a Post doc fellow and Neuro surgeon as well as MLA belong to the Gaddi community. This connectivity with the community gives them both cultural knowledge and broader academic perspectives. The political representatives can advocate for policies that support Transhumance communities, and helps in bridging traditional practices with modern governance.

Knowledgeable respondents views regarding livelihood challenges of Gaddi community

83.3 per cent of the respondents reveal that geographical isolation of the tribal villages with difficult terrain is the major livelihood challenge for Gaddi Community. Further, 66.6 per cent of the respondents cite extreme weather conditions as a

livelihood challenge. Poor irrigation facilities for cash crops is cited by 60 per cent of the respondents. Poor road connectivity and lack of healthcare infrastructure is cited by 50 per cent of the respondents respectively. Cultural shift and influence towards more modern ways of living is cited by 40 per cent of the respondents while inadequate access to quality education is cited by 33.3 per cent of the respondents.

Majority of the respondents stated remote locations of the tribal villages, located at difficult mountainous terrain poses hardships for Gaddi people and their community. Remote areas lack access to essential resources like electricity, health and road facilities, etc. A respondent from *Saunthal* village is of the view that, '*hum boht zyada pichde hain, isiliye health facilities nahi hai, educational facilities nahi hai, na hi school hai*' (Due to geographical backwardness of the villages, we lack in education and health services).

Additionally, transporting the goods and services to remote areas is very expensive and time consuming due to long distances and rough terrain. A farmer from *Banni* village stated that, "*constructing a concrete house in these isolated areas is very difficult. The raw material such as cement, bricks, iron, glass, etc. are transported either through a mule or Garrari (Ropeway) which is quite expensive. It takes almost 3–4 years to construct a house in these isolated villages. Moreover houses are mostly constructed manually by using traditional methods which lack mechanical technology which consumes a lot of time and money.*"

Further, extreme weather conditions especially heavy snowfall during winters pose serious challenges for people. As

TABLE 5 Distribution of knowledgeable respondents by educational qualifications & occupation.

S. No.	Educational qualification	Occupation	Number of respondents	Percentage (%)
1	Illiterate	Farmer	8	26.66
		Housewife	1	3.3
		Priest	1	3.3
2	Primary (I-V)	Priest	1	3.3
		Village Pradhan	2	6.6
		Farmer	1	3.3
3	Matric	Shopkeeper	1	3.3
		Village priest	1	3.3
		Farmer	1	3.3
		Village Pradhan	1	3.3
4	Higher secondary	Shopkeeper	1	3.33
5	I.T.I diploma	Shopkeeper (Electrical)	1	3.33
6	Graduation	Ex-army personal	1	3.3
		Journalist	1	3.3
		Junior engineer	1	3.3
		School teacher	4	13.33
7	Post-graduation	College Principal	1	3.33
8	Ph.D/PDF	Hotel manager	1	3.33
9	Doctor and MLA	Neuro-surgeon	1	3.33
			Total: 30	100

is narrated by one of the respondents, “*Barf mein bahut mushkil hoti hai. Na khane ki suvidha na peena ka pani. Barf ko pighla ke pani istemal kartey hain. Hame badi zyada mushkil hoti hai. Chote bachon ko thand se bachana, jaanwar pareshan rehte hain. Auraton k liye badi mushkil hoti hai ki khana kaise banaye itni thand mein*” (When it snows, we face a lot of difficulty. At times, pipeline freezes. The snow is collected and the water after boiling the snow is used for domestic chores. Women of the household face additional difficulty of cooking food in extreme cold).

Another respondent is of the view that during snowfall, “*we need to utilize the food resources very carefully. There is limited option for food. It seems like life has stopped for some time. Snowfall increases the risk of injuries on steep slopes.*” Another respondent from Suppa village is of the view that “*communication to work is disrupted.*” The power lines are damaged with no electricity for days, impacting daily household chores. The roads are blocked and the villages are isolated from the main town.”

Further, lack of irrigation infrastructure like channels and storage facilities further exacerbate the challenges in irrigating the cash crops. In addition to this, most of the Gaddi houses are constructed on higher lands closer to the forest areas so as to easily graze their animals for the fodder. Many tribal hamlets are not connected by metalled road. In case of health emergency, it becomes challenging for transporting patients to the main road.

Usually, they are carried down through a *palki* (plinth) or on shoulders of the other person. This increases the risk of fall and injuries for both. School children also face difficulties in attending the school due to lack of transportation options. This might lead to high drop-out rate and limited educational opportunities. As is stated by one of respondents, “*due to lack of road connectivity to the village, my sisters dropped out from the school because it took approximately 2 hours to travel on the kutcha road to reach the school which was located in another village.*”

The above testimonies highlight that geography of the region, infrastructure and social factors collectively impact the livelihood of Gaddi community. Therefore, there is an urgent need of a development interventions that addresses the aspects.

Despite tough nature of Transhumance and livelihood challenges, long distance migration remains an integral part of the lives of the Gaddis. The case study of a 72-year-old Gaddi transgender person from Malkauta village in Bharmour sub tehsil is not merely a narrative but provides an analytical lens into the intersection of gender identity and traditional system of Transhumance within the Gaddi community.

Case 1: Transgender person or “*sadhan*” in local Gaddiyali language is engaged in pastoralist lifestyle since childhood and traverses through tough mountain passes with their herd of goats and sheep. Dressed in a traditional Gaddi male attire, wearing

kurta and pajama with a waist coat (*sadri*), head cover (*topi*) and a pair of big golden ear rings (*Nanti*). They² have four sisters and a brother. The brother refer to them as female “*Ae babe nah, vai vuh na karura*” (they are transman and did not marry).

They have been practicing transhumance since the age of 7-8, initially accompanying their father on migratory routes. The sadhan expresses a strong emotional connection with goats and sheep, stating that *Jhanoke hosh sambhaluria dhan ae charu karde* (they have doing this work since gaining consciousness). Reiterating further, they also stated that, *Hor bache schhole gande thie na, tai aun behda re schoole gandha thu na*’ (I happen to attend a school of sheep herding while other children attended regular schools).

The sadhan recounts several incidents that highlight the difficulties of the profession and stated that, ‘*dhana shogi ta sukh na ichi sakda kadi, okha kamm ae*’ (the transhumance profession is really tough, one cannot hope for happiness and peace). For instance, in the late 1980s, they single-handedly recovered nine stolen sheep from Gujjar herders, including newborn lambs. During summer season (June-July), while moving towards their assigned pasture in the Tundah valley, they discovered that the nine sheep were stolen by the Gujjars. They alone went to the Gujjar *Dera* (Temporary shelter) and brought back their nine sheep and their young ones which were delivered at the Gujjar Deras. Later, sadhan realized that out of the nine sheep, five sheep had delivered babies and one lamb is still missing. They figured out this through the udders of lactating mother sheep. They again went back and figured out their lamb from Gujjars herd, although they had never seen that lamb before, they recognized it from the lamb’s wool that resembles the mother sheep. During this incident, they were also hit by stones, when they were fighting for their lamb. In another incident, while returning back from the mountain, the herd passed through one of the villages. The villagers happened to steal one young lamb and slaughter it. Sadhan came to know about it and picked left-over bones of the young lamb and went to the police station to file FIR against the villagers.

Another challenge faced during migration as is narrated by the Sadhan is the issue of bribe taken by the forest officials for grazing the herd in the forest areas. They had also courageously fought off a wild bear attack in 2008 that injured their two men and a goat. Through their experience and courage, they hit the head of the bear with a steel rod and saved the entire herd from being killed.

Furthermore, travelling through the same route over years has also acquainted the sadhan with immense knowledge of herbs and medicinal plants. Plants like *Bhujpattar* (*Betula utilis*), *kuth* (*Dolomieae costus*), *wild garlic* and *kutki* (*Picrorhiza kurroa*)

are often used by them to treat various kind of diseases of the herd.

They also express concern about the younger generation’s reluctance to pursue this traditional lifestyle, citing a lack of confidence and willingness to endure hardships. They stated that ‘*Sabhi re basa ri gal ni dhan chaarna. Mahina bhar vagair nahine raina painda, dhan charna ta haira dhudh pai kari shadu bani gachha, tan dhan charda*’ (Everyone cannot be a herder. For months, we don’t take bath and it takes a lot of courage to be a herder).

The tough nature of the profession and lack of basic amenities like food, water and shelter is challenging in today’s era of modernization with much easier lifestyle.

The case study emphasizes extraordinary resilience and dedication of the Transgender person. Despite being diagnosed with Parkinson’s disease in 2015, a progressive neurological disorder that significantly impacts mobility and daily functioning, the Sadhan continues to participate in the transhumance lifestyle, albeit with some modifications. They now limit their migratory journeys to the summer months, adapting their traditional practices to accommodate the health condition. When asked about the retirement from this profession, they proudly stated that, ‘*abe taan mari gala aaun tan hi chhutna ai pesha* (only death will separate me from this way of life). This sentiment underscores the deep cultural and personal connection of transhumance, transcending physical limitations and health challenges.

The ‘transman’ has been practicing transhumance since childhood, a profession which is entirely the domain of males and it is this very fact that makes this case study unique and significant for the present study. This case represents a classic example of how social identity and traditional practices are constituted within the Gaddi community. Most importantly, it presents a unique example of how this traditional practice of Transhumance is not merely an occupation but an integral part of the identity and life purpose of the Gaddis, negotiating and redefining gender roles. Transhumance is a socio-cultural institution adapting to human experiences, thereby the case study reinforces the theme of the paper regarding the transition and inclusive nature of the pastoral herding in the Indian Himalayas.

Discussion

Sustainable pastoralism can significantly contribute in achieving the Sustainable Development Goals (SDG’s) and the implementation of these goals can in turn, enhance the sustainability of the pastoral systems. The recognition of the year ‘2026’ as the *International Year of Rangelands and Pastoralists* by the United Nations has resurface the various socio ecological benefits of Pastoralism (Dyer, 2017; Mieke et al., 2019).

The findings of the present study highlights that the traditional system of transhumance which is practised by the Gaddi herders of District Chamba in the State of Himachal Pradesh does not merely

² They -The pronoun “they” is used to refer to the Transgender person.

contributes to the environmental sustainability but also to the socio-cultural and socio ecological resilience.

In the present study, the seasonal migration of the Gaddi herders along with their herd of goats and sheep from one alpine zone to another helps to support and conserve the biodiversity (Bhattacharya et al., 2019; Negi et al., 2020). Long distance seasonal migration practiced by the herders helps to prevent overgrazing and preserve the forests resources. This aspect of the Transhumance aligns with target 15.2 of the SDG that aims to protect and restore the sustainable use of land ecosystem (Miehe et al., 2019). Additionally, the to and fro movement of the herd across summers and winter pastures helps to improve the fertility of the soil and prevent land degradation that aligns with target 15.3 of SDGs. The pastoral produce of the herd including meat, milk and sheep's wool helps to enhance the food security that rightly aligns with goal 2 of the SDG and also helps to enhance rural economy (SDG 8) (Aryal et al., 2016; Ramprasad et al., 2020b). Similarly, the constant migration of the Gaddi herders across different pastoral land helps to adapt climate variability exemplifying resilience that aligns with goal 13 of the SDG (Ramprasad et al., 2020a; Ramprasad et al., 2020b).

There are also some research studies conducted in some regions of Lahaul and Spiti that corroborates with the findings of the present study highlighting the significance of Transhumance. The study explores that rotational grazing of the pastoral animals help to regenerate the pastoral lands and alpine meadows, maintaining vegetative cover and conserving the local flora and fauna (Sharma and Thakur, 2018). Similar research studies from areas of Kinnaur and Chamba region further demonstrates that significance of rotational grazing for the environment. It emphasizes on the fact that the seasonal movement of the herd across different pastoral land helps to maintain the fertility of the soil and conserve indigenous plant species ensuring long term productivity of the rangelands (Bhattacharya A. et al., 2019; Singh, 2021a; Singh, 2021b). However, this traditional system of transhumance is slowly declining among the various pastoral communities of the Himalayan region. The decline in the Transhumance profession is related to various interconnected factors including to cultural, environmental and other socio-economic factors.

Recent study from the Trans-Himalayan region of Leh and Ladakh areas highlighted that transhumance is slowly declining and more particularly among the younger generation because of various interconnected factors ranging from diversified livelihood choices including tourism, and modernization (Ladon et al., 2023). In addition to this, climate-induced hazards such as cloudbursts and flash floods have further degraded the pasturelands and intensified the vulnerabilities of these pastoralists (Naess and Parker, 2013). Transhumance has slowly declined among the Bhotiyas (an agro -pastoralist community) of the Kumaon region in Uttarakhand State of India. Historically, *Bhotiyas* participated in Trans-Himalayan trade with Tibet and moved livestock to and fro. The closure of the Indo-Tibetan borders after the war of 1962 also closed the commercial basis of this trade

making the livestock, wool trade as economically non-viable. The community moved towards the cultivation of cash crops, more sedentary jobs that lead to social and ecological changes to their traditional livelihood (Negi, 2007). Similarly, Bergmann (2016) explored how the *Bhotiya* community of Uttarakhand, who were once engaged in the trans-Himalayan trade and transhumant livestock rearing, has undergone increased sedentarization due to changing political and economic conditions. However, despite the changing nature of Transhumance, the *Bhotiyas* have adapted to these socio economic changes by increased educational level and awareness, employed in government sectors and enhancing tourism etc. Similar and comparable trends are also visible among the Bakarwals of Jammu and Kashmir, who are increasingly abandoning the seasonal migration because of factors like loss of grazing lands, reduced forest access, and waning intergenerational interest in herding (Dar and Kumar, 2020; Das et al., 2023; Singh and Kerven, 2023).

Environmental unpredictability has further compounded these issues. The changes in weather conditions including early onset of heavy rainfall and snow in the early weeks of September 2025 in the higher pastures of Lahaul and Spiti region severely affected the Gaddi herders who were descending back from the higher summer pastures to lowland pastures in preparation for the winter season. It was estimated that approximately a hundred and fifty Gaddi shepherds were stranded at one place for days without proper food and shelter in the high-altitude zones of the Bara Bhangal valley (in Kangra) and in some parts of Lahaul and Spiti Districts. Sudden flash floods triggered by intense rainfall caused greater loss to these migratory Gaddi herders. Climate change induced weather events in the form of heavy rainfall, increased snowfall and flash floods have disrupted the socio ecological knowledge system and decreased nature of Transhumance among the semi nomadic Gaddi tribe (Sood A., 2025; Sood R., 2025).

In the present study, the Gaddi herders are increasingly facing issues relating to delayed forest permits and encroachment of their grazing lands. This is highly attributed to the construction of hydro power development projects. This largely affects the herders livelihood (Rawat M. et al., 2017; Rawat G. S. et al., 2017).

Thus policy frameworks must be designed keeping in mind the local needs and issues of these herders. A comprehensive support system for the herders is the need of the hour where a policy reform from a restrictive approach to facilitative one is required. One may find inspirations from the Kinnaur region where the establishment of the cooperative wool markets have helped in increasing the herders economic returns (Mehta D., 2020; Mehta P., 2020). Therefore, similar local cooperatives should be established for the Gaddi herders. This will help in increasing the economic viability specifically in terms of collective sale and marketing of the local wool. These cooperatives would also help in providing a fair pricing mechanisms and thus help in preventing exploitation by the middlemen.

Recent studies from Ladakh and Uttarakhand region has explored that the use of satellite-based pasture monitoring helped

the herders in effective planning of their migratory routes, resulting in reduced grazing conflicts and improved resource management (Dorje et al., 2024). Extending such technology-driven approaches to the Gaddi herders could help mitigate the risks associated with climate variability.

A comprehensive support system for Gaddi's must also include other measures including the construction of temporary shelter areas and provisions of tents in their summer grazing grounds. These shelters will protect them from extreme weather conditions including heat, rain, and snowfall. The government must also establish including enhanced police assistance in case of theft of the livestock. Additionally, the forest permit process should be streamlined, with improved healthcare facilities and more specifically mobile health camps for the Gaddi men and their herds along the migratory routes. Financial support, insurance schemes for livestock, and recognition of traditional ecological knowledge must also be ensured. Social security measures, such as old-age pension schemes for herders should be implemented to provide economic stability to the community and encourage the continuation of these traditional practices.

In sum, the findings of the present study suggests that the system of transhumance is slowly declining from various interconnected factors like modernization, environmental change, increased infrastructure development and some policy interventions but it remains a significant part of the environment and helps promote ecological balance, cultural systems and rural resilience among many pastoral communities of the Himalayan region and more specifically among the Gaddis. It is believed that with the adoption of inclusive and adaptive government approaches, pastoralism can be revitalized and aligned with the notion of sustainability. The voices of the Gaddi men and women need to be included in every development forum keeping in mind the cultural sensitivity of the community as the researcher believes that local problems always need local solutions.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

As the research was conducted in a non-invasive manner (interviews and focus group discussions), informed consent

of the participants was taken prior participating in the study and was secured, and interactions took place in research participant's natural settings without involvement of any institution. Formal ethical clearance is not obligatory for the present study. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

AT: Formulation of Research Problem, Idea Conception, Methodological Research Design, Data Collection, Data Interpretation, Data Visualization and Drafting of the Manuscript. MK: Idea Conception, Methodological Research Design; Supervision, Manuscript Editing. All authors contributed to the article and approved the submitted version.

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The authors(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declared that generative AI was not used in the creation of this manuscript.

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