

SPATIAL AND TEMPORAL CULTURAL TRANSFORMATION OF GADDI TRIBAL COMMUNITY IN CHAMBA AND KANGRA DISTRICT IN HP, BHARAT

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Abstract

For the Himalayan Gaddi culture, transhumance—the seasonal movement of people and their animals—means both resource management and a means of subsistence. Although they have been doing it for generations, the practice is currently dwindling quickly. As a result, we compiled information on Gaddis' present patterns of cultural transformation and the related new elements that are contributing to the fall in transhumance. This was accomplished by using snowball sample survey methods for transhumance surveys, which focused on 15 pastoralists, and stratified sampling approaches for questionnaire recordings with the Gaddis (n = 93). in the research area, which is thought to be where they originated. Even though Gaddis still engage in transhumance, there is a clear lack of interest in the practice, as seen by the drop in the number of permits for moving and owning animals. In the current study, changes in (i) housing type, (ii) livelihood practices, and (iii) lifestyle behaviours have been used as metrics for measuring cultural shift. The bulk of Gaddi towns are found in the three natural zones. An attempt was made to capture the characteristics of various sections of the research regions by selecting villages from each ecological zone, each small microclimatic zone, each watershed, and each tehsil. The six villages were chosen as follows: Holi and Chamba, Dalhouse (Chamba district), Palampur and Dharmshalla (Kangra district), and Kugti, Bajol, Lakra, Bariata, Bohl-Jhajharda, and Karari Khas in the tehsil Bharmour (Chamba district). As you're doing that, this index was calculated using a simple procedure that was altered from the UNDP Method for the Human Development Index in order to fit the parameters of the Human Development Report (2016). The study attempts to develop an indicator of cultural change

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based on the previously provided information. Significant alterations in the way of life, the system of livelihood, and settlements. Also, the main limiting elements are indifference in cultural activities and traditional occupations. Giving up transhumance is also encouraged by Gaddis's belief that children need to be educated. Therefore, the loss of transhumance will affect both the related knowledge and the long-standing custom. It is necessary to create and put into effect policies that would support these herders and ensure their sustainable development.

Introduction

The current study aims to comprehend how the studied area was altered by cultural change. It would appear reasonable to comprehend what cultural transformation is before looking into the cultural shift of the research region. "An act, process, instance of transforming or being transformed" is how Merriam-Webster defines transformation (2019). According to Firth (1954), social and cultural revolution is a slow process that results from a collection of minute behavioral modifications people make in reaction to shifting social, technological, economic, and physical conditions. This study concentrated on the cultural shift and raised questions regarding the transhumance tribal society in the Himachal Pradesh state, home to the Gaddis. The following research questions have been attempted to be addressed as a result of the literature assessment: Which methods of environmental adaptation were employed in the traditional, indigenous Gaddi region? To what extent and in what ways did the cultural traditions of the Gaddi tribe evolve as a result of this relationship? To what extent does this shift align with the cultural markers of the Gaddi tribe's metamorphosis? The study's goal is to comprehend and map the parameters and signs of cultural alteration in the Himalayan region inhabited by the Gaddi tribe.

Study Area

The study region, which includes the districts of Chamba and Kangra in Himachal Pradesh, is located between $31^{\circ} 38' 35''$ and $33' 13' 59''$ North and $75^{\circ} 29' 09''$ to $77^{\circ} 29' 09''$ E. It is 12,667 square kilometres in size and encircled by magnificent

mountain ranges on all sides. There are mountains all around, reaching elevations of 500–6000 meters. The districts of Lahaul and Spiti in Himachal Pradesh and Doda and Kishtwar in Jammu & Kashmir border it on the north. The Himachal districts of Una and Hamirpur are located to the south. Mandi and Kullu districts are located in the east. The study region, which encompasses the drainage basins of the Middle Beas and Upper Ravi rivers (both located in the districts of Chamba and Kangra), borders it on the west. This area has historically been a stop on pastoral tribes' migration routes, and as a result, it boasts a variety of stunning and difficult treks that interest adventure travellers.

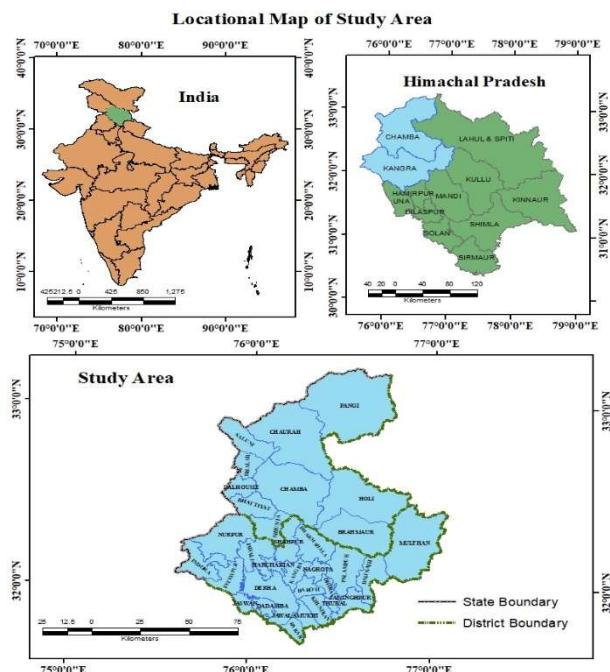


Figure: Location Map of Study Area

The Gaddi tribe mostly inhabits the areas of Dharamshala, Bharmour, and Holi. The environment and the way the local people interact with it are changing as a result of the introduction of infrastructure brought about by development activities.

Selection of Sampling Field Survey and Villages

The sampling design was developed with the study's objectives in mind. To understand how the Gaddi tribe changed as a result of state-adopted development methods, methods specifically targeted at mainstreaming tribal through the construction of infrastructure to connect outlying areas with the central area and to give the populace access to jobs were examined. The study communities were selected from three natural zones spanning from the southwest to the northeast: the southern slopes of the Pir-Panjal, the northern slopes of the Dhauladhar, and the southern slopes of the Dhauladhar. An attempt was made to represent the characteristics of various places within the research area by selecting villages from each ecological zone, each small microclimatic zone, each watershed, and each tehsil. The six villages in the tehsil Bharmour, Holi, Chamba, Dalhouse, Palampur, and Dharmshalla, respectively, were named Kugti, Bajol, Lakra, Bariata, Bohl-Jhajharda, and Karari Khas.

Table: Selection of Sample Survey (Design & Villages)

Ecological Zones	Tehsil	Sample Villages	Attitude	No. of Household	No. of Household Survey
Southern Slope of Pir Panjal (Situated between Ravi and ridge of the Pir-Panjal)	Bharmour Holi	Kugti Bajol	2610 2444	40 61	09 11
				101	26
Northern Slope of Dhauladhar (between Ravi and Ridge of Dhauladhar)	Chamba Dalhousie	Lakra Bariata	1667 1581	202 74	21 11
				278	32
Southern Slopes of Dhauladhar	Palampur	Bohl-Jajharda	1269 1280	65 85	12 10

(Between Beas & Dhauladhar ridge)	Dharamshala	Karari Khas	1794	94	19
Total	6	6	–	621	93

Source: Generate by Scholar 2023

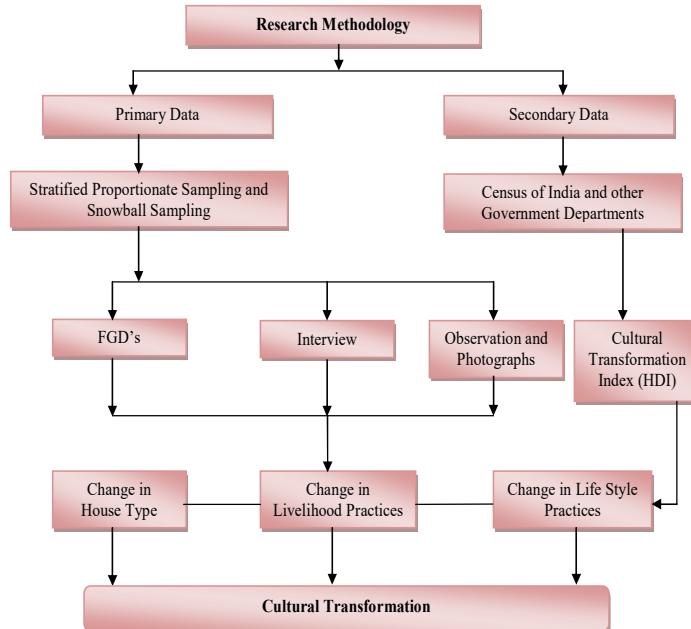
Dhauladhar; Northern Dhauladhar slopes and Southern PirPanjal slopes). These three ecological zones are where the majority of Gaddi settlements are located.

Methodology

The section is based on an analysis of first-hand data collected during fieldwork. A total of six villages were selected for the study. The communities were selected using snowball random sampling and stratified proportionate random sampling. The sample included a proportionate representation of each of the three primary ecological zones in the research area. Among these were the biological zones of the Southern Pir-Panjal, Northern Dhauladhar, and Southern Dhauladhar. Every family in the selected villages was included in the sample that was surveyed in order to conduct fieldwork. The change in house type, the change in livelihood practices, the change in lifestyle practices, and the change in cultural practices are the four sections that comprise the current portion. In order to comprehend the indicators of location, structure, building material, etc. of the houses, the data was collected at the household level from the sampled villages, combined at the district level, and represented over a variety of time periods for the parameter of change in house type.

Finding representative social complexion indicators and comprehending their behaviour over time would be the initial step in this direction. The optimum way to frame the indicators is in relation to the dominant social character of the study area.

Figure: Methodology



Source: Prepared by Research Scholar, 2023

Parameters and Indicators

In the present work cultural transformation has been measured in terms of change in (i) *house type* (ii) *livelihood practices* and (iii) *lifestyle practices*. On the basis of the aforementioned, the study aims to create an indicator of cultural transition. The aforementioned include integral parts of the cultural landscape and are all susceptible to changes prompted by larger socio-economic and politico-administrative systems. The indications used to gauge each of the following are listed in Table.

Table: Parameters and Indicators of Human Development Index (UNDP), measures Cultural Transformation

Parameters	Indicators	Explanation	Survey Question	Source
Change in livelihood practices	The shift away from cultivating traditional crops.	All households were considered to have traditionally grown traditional crops including barley, wheat, mustard, and peas for the Rabi season and silul, chanai, maize, Phullan, Bhre, and kodra for the Kharif season. The percentage of households that are no longer using traditional practices was calculated, and this value was assumed to represent the degree of change away from traditional practices for light and drinking water. It is assumed that 100% of households were using firewood as a cooking fuel and using Bouri as a traditional source of drinking water.	Do you have such income from other than agricultural? How many of Bigha's land in your home? How many years you have been cultivated land and then when you have leaved it?	HDI (UNDP) report 2016. Designed Just for this questionnaire.
	The shift away from Sheep /Goats rearing.	It is assumed that 100% of households owned sheep in	How many total sheep and goats you have? Do you ever feel	HDI (UNDP) report 2016. Designed Just for these

		order to compute the change in structure of livestock reared.	that have the decrease in sheep/Goat rearing?	questionnaires.
	The shift away from pastoralist	(Change in livestock rearing structure = 100 less the percentage of families currently raising sheep.)	How many of you are engaged with the profession about pastoralist?	HDI (UNDP) report 2016. Designed Just for these questionnaires.
Change in Life style practices	Shift away from traditional sources of drinking water, lighting and type of cooking fuel.	To calculate the shift in the structure of the profession, it is assumed that every home engaged in pastoralist.	What are the major sources of light in your village? What are the sources of drinking water? What kind of materials do you have used as a cooking fuel?	HDI (UNDP) report 2016. Designed Just for these questionnaires.
	Shift away from use of traditional constructional material like stone, slate and wood.	When assessing the change in the structure of the sources of necessary amenities like light and drinking water, it is assumed that 100% of families were using firewood as a cooking fuel and using Bouri as a traditional source of drinking water.	Mature of materials does supposed to be used in the house?	Designed Just for these questionnaires.
The Interaction of and	Sources and nature of building material	To measure the shift in the usage of	From where you supposed to get the material for	Designed Just for these questionnaire

dependence of the cultural region	construction materials, the removal of traditional building materials used to construct walls (Stone), flooring (Wood), and roofs (Steel) was computed individually.	house or building construction?	
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Source: Prepared by Research Scholar, 2023

Estimates state that the degree of divergence from traditional cultural behaviours is referred to as cultural shift. An index of cultural transformation was developed to assess the degree of cultural shift. This index was calculated using a simple procedure that was altered from the UNDP Method for the Human Development Index in order to fit the parameters of the Human Development Report (2016).

The normalized shift score for each sampled village in the study region along each indicator was calculated in order to ascertain the change along each of the parameters over time. In order to accomplish this, indices with values between 0 and 1 were created using the percentage values. In this case, the minimum and

$$\text{Dimension Index} = \frac{\text{actual value}-\text{minimum value}}{\text{maximum value}-\text{minimum value}}$$

maximum values were determined to be zero and one, respectively. After adding together all of the changes compared to each indicator, the index of cultural transition was calculated by dividing the total by eight. The percentage of deviation from standard procedures for each indicator was determined using the following formula.

It was believed that all traditionally grown crops made up 100% of the total. Half of this was earmarked for crops in Rabi and the other 50% for crops in Kharif. The change in cropping patterns was calculated as the percentage of traditional

crops displaced by modern crops. A weighted average of 50 divided by the total number of crops grown during a season was applied to each crop.

It is assumed that 1% of households owned sheep, 1% used firewood as a source of cooking fuel, 1% practiced pastoralist, 1% used traditional sources of light (wood and/or kerosene), and 1% used Bouri as a source of drinking water in order to calculate the change in the structure of livestock raised, the source of cooking fuel, livelihood practices, and sources of basic necessities like light and drinking water. So, the following formula was used to determine the change:

1. Change in structure of livestock reared is equal to 100 minus per cent of households still rearing sheep.
2. Change in use of cooking fuel is equal to 100 minus per cent of households still depending on firewood as cooking fuel.
3. Change in livelihood practices is equal to 100 minus per cent of households still practicing pastoralist
4. Change in source of light is equal to 100 minus per cent of households using sources of light other than electricity.
5. Change in source of drinking water is equal to 100 minus per cent of households still using Bouri for drinking water

After calculating the shift in each of these three, the final value of the shift or change was calculated by adding and dividing by three. Changes in the "source of the construction material" were examined using the same methods as changes in "construction material." There is a simple rationale for the techniques used. The degree of change in the conventional cultural indicators was measured. The starting point in this case was the usual complexion. The departure from the baseline image was used to determine the degree of change with respect to a particular indicator. After standardizing, combining, and averaging the changes in each indicator, a comprehensive index of cultural transformation was produced.

A shift away from pastoralist practices seems to have been the main transformation for the research region as a whole. Pastoralist practices are no longer followed in 96.4% of the families. The other two indicators, which indicate a significant

divergence from customary practices, are the means of obtaining basic needs like light and potable water. The shift in the last two indices has been more noticeable in the district of Kangra than in Chamba. This is because Kangra's infrastructure has undergone more extensive development than the district of Chamba. The least degree of change has been made to the building material and its source (whether from within or beyond the cultural region). The change in Kangra is also more significant than the change in the Chamba district in this case. Numerous patterns of cultural change at the village level can be found, based on calculations for the sampled communities. Bajol in the Chamba district has a transformation rating of 0.367, while the village of Bhol-Jajhardha in the Kangra district has a transformation score of 0.849. Most of the settlements in the Kangra district have undergone the most modification (Figure 4.5). The group with a significant degree of modification includes five communities. Of them, only one (Bariata) is in the district of Chamba; the other two (Karieri Khas and Bohl-Jhajhardha) are in the district of Kangra. There are two of them in the Kangra district, one in the Palampur tehsil and one in Dharamshala, that are less than 1500 meters above sea level.

Table: Availability of and Access to Infrastructure in Sampled Villages

Ecological Zone	Tehsils included	Sampled Villages	Altitude (metres)	Road Connectivity		Distance from Metal led Road	Distance from PDS/ Fair Price Shop (kms)	Distance from Health Care Facility (kms)	Distance from Primary School (kms)
				Kutchha	Pucca				
Southern slopes of the Pir-Panjal	Bharmour	Kugti	2610	No	No	8	3	18	0.5
	Holi	Bajol	2444	No	No	5	5	17	0
Northern slopes of the	Chamba	Lakra	1667	No	No	5.5	5.5	5.5	0
	Dalhousie	Bariata	1581	Yes	No	1.5	2	2	2

Dhaura dhar									
Southern slopes of the Dhaura dhar	Palampur	Bohl- Jhajha rda	1472	Yes	Yes	0	1	6	1.5
	Dharamshala	Kareri Khas	1794	Yes	No	6	0	12	0

Source: Based on Fieldwork, 2023

Both are in the Southern Dhauladhar region. The one in the Chamba district is located on the northern edge of Dhauladhar. It is located in Dalhousie, maybe the most developed tehsil in the Chamba district. Because of its proximity to Dalhousie's tourism sector and the cantonment of Bakloh, Bariata actually stands out as an island of cultural transformation surrounded by an area demonstrating very low levels of cultural alteration.

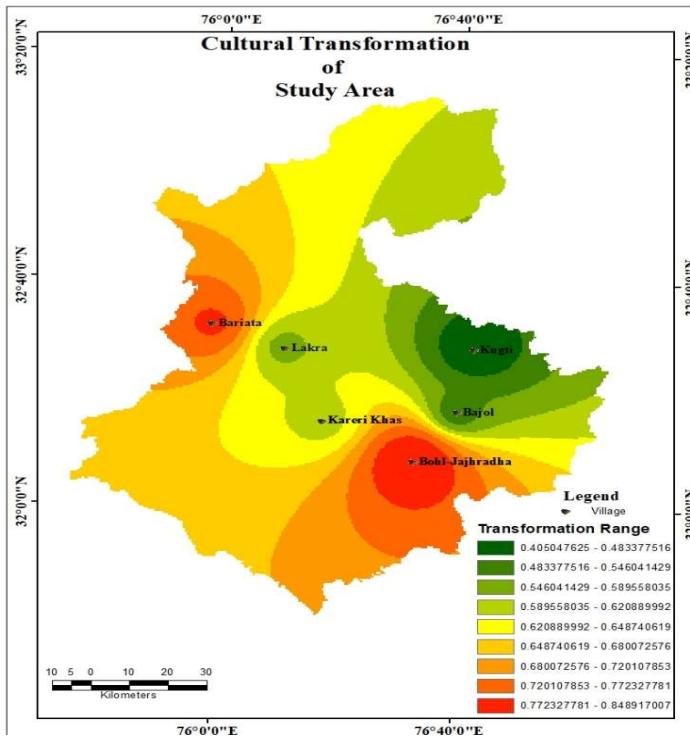
Table: Cultural Transformation

	Village	Cropping Pattern	Structure of Livestock Reared	Use of Firewood	Livelihood Practices	Source of Light	Source of Drinking Water	Nature of Building Material	Source of Building Material	Transformation Index
CHAMBA	Bajol	0.500	0.792	0.172	0.937	0.692	1.000	0.000	0.000	0.512
	Bariata	0.333	1.000	0.667	0.988	1.000	1.000	0.526	0.769	0.785
	Kugti	0.500	0.565	0.477	1.000	0.697	0.000	0.000	0.000	0.405
	Lakra	0.400	0.750	0.600	1.000	0.852	1.000	0.000	0.000	0.575
KANGRA	Bohl- Jaharda	0.250	1.000	0.730	0.947	1.000	1.000	0.967	0.900	0.849
	Kareri Khas	0.250	1.000	0.600	0.978	0.904	1.000	0.420	0.391	0.693
	Chamba	0.43	0.77	0.47	0.98	0.81	0.75	0.13	0.19	0.56
	Kangra	0.250	1	0.665	0.9625	0.952	1	0.6935	0.6455	0.771
	Study Area	0.34	0.885	0.5675	0.97125	0.881	0.875	0.41175	0.41775	0.6655

Source: Based on Fieldwork, 2023

All the communities undergoing major cultural transformation, with the exception of one, have a route connecting them. The sole village in Kareri Khas with a high degree of cultural change, even though there are no highways, is located in the Dhauladhar range at the lowest elevation of all the villages—386 meters—in the Dharamshala area. This condition may indicate a total change in the source region of the building materials employed in this settlement. Road connectivity is available, and for every other community that fits under the high-level cultural transformation category, the distance from a metallic road is less than two kilometres. A metallic road is really constructed all the way to the village in the Bohl-Jhajharda cases.

Figure: Cultural transformation



Source: Prepared by Research Scholars, 2023

Three of the villages have a cultural transition index: Bajol (0.512), Lakra (0.575), and Kugti village (0.405). Three of them—Bariata, Bohl-Jajhardha, and Kareri Khas—are over 1500 meters in elevation, and they are dispersed throughout the Pir-Panjal. The average distance between these settlements and metalled roads is over four kilometres, and none of them have access to one. The nearest metalled road is at least six kilometres away from Kugti and Lakra, two settlements. All of these villages—aside from one that exhibits the least amount of cultural change—are located in the Chamba district. Three of these, Lakra and Bajol, are located in the centre of the cultural zone, which is made up of Chamba and Holi. It is clear that topography—including height, the distance and proximity to metallic highways, as well as the centre and periphery of the cultural region—all plays a role in the region's changing cultural landscape.

Discussion

Consideration has been given to the evolution of various dwelling kinds, livelihoods, and lifestyles in the region when analysing its cultural development. The rationale behind selecting these categories was that historical environmental conditions had an impact on them all, and their physical manifestation—a cultural landscape—was the result of interactions between people and their surroundings.

There was a noticeable change in the sorts of houses, as seen by the way they were positioned from the settlement toward the fields, how they were built (from kutcha to pucca), and how they used materials that were brought in from elsewhere. The communities in the Kangra area were impacted by the relocation significantly more than those in the Chamba district. The factors controlling the transformation were the degree of interaction and proximity to the outside world, the accessibility level, and the kind of resources available in the area.

On the other hand, the use of chemical fertilizers, exotic plant and animal breeding, high-yield crop varieties, pastoralist activities, and the shift from subsistence to commercial agriculture were all far more noticeable changes in livelihood practices. This may be explained by rising educational levels, higher aspirations among the general public, physical changes limiting access to pasture

lands, and customary movement patterns. Reduction in the number of crops grown and shift in dietary preferences were followed by the adoption of high yielding crop kinds and artificial fertilizers. Because of the breakdown of community bonds, a cash economy had taken the place of a barter system, and interactions between farmers and pastoralists were now marked by rivalry rather than collaboration.

The respondents' access to modern comforts including fuel, electricity, water, sewage, and banking and communication services, among others, has shown changes in their lifestyle. The villages in the Kangra district were found to be doing better than those in the Chamba district once more. A more accommodating topography, a warmer climate, and increased exposure to external stimuli were the causes of this. Nonetheless, the locals were fully aware of the policies and programs put in place by the government to assist them. In addition to these benefits, the Gaddis' position and the degree of progress they had previously achieved in the area shaped their goals in life. The Gaddis in Kangra, who had profited from the region's social and economic infrastructure, wanted to diversify the nation's economy and create more job opportunities, while those in Chamba were keen to enhance the area's social and economic infrastructure. The research region's and its sections' cultural change index contains a summary of this study. The largest cultural shift is evident in the Southern Dhauladhar communities in the Kangra district. In the Chamba district, Bariata, a village close to the popular tourist destination of Dalhousie, was the only one to experience a notable degree of cultural transformation. It is discovered that state-led initiatives to alter the region, along with connectivity and accessibility, are what lead to cultural transformation. It is clear that there is a greater degree of cultural transition as one move from the centre to the periphery. There is also evidence that the relationship between people and their surroundings is evolving in a similar way.

Conclusion

There has been a noticeable change in the cultural composition of the Gaddi-inhabited area during the last many years. There are numerous indicators of this shift, such as the shift from kaccha to pukka housing and the split of joint to nuclear households, as well as rising literacy rates, emigration trends, especially from the core areas, and a shift in the industrial makeup of the workforce from the tertiary to the agrarian sectors. The previously listed factors collectively lead to a rise in the need for resources and land, as well as a move away from customary livelihoods. Development inputs from outside the region, such as basic and local infrastructure including roads, hospitals, schools, and colleges, have helped to support the trend. The land's potential as a hydroelectric resource and its status as a scheduled area have contributed to the momentum of the cultural shift that has taken place. It seems reasonable that cultural transformation is occurring in different parts of the community. The district of Kangra has been ahead of the district of Chamba since change occurred here earlier. The most notable changes, however, have been made to the important tribal tehsils of Holi and Bharmour in the Chamba district. Needless to add, the transition is both a cause and an effect of shifting human-environment relations.

The local Cultural Revolution can be understood as the alienation of people from their local context and their assimilation into a wider, national, or even global environment. The Gaddis are now more vulnerable to the vagaries of the global system since they have better access to resources and technologies that are located much farther away from their immediate surroundings. The social and cultural developments have also had an impact on the physical landscape.

References

- Census of Bharat. 1961a. Village survey of Bharmour. New Delhi: Census of Bharat.
- Census of Bharat. 1961b. Village Survey of Chhatrari. New Delhi: Census of Bharat.
- Census of Bharat. 1961c. Village survey of Devi Kothi. New Delhi: Census of Bharat.
- Census of Bharat. 1961d. Village survey of Hatli. New Delhi: Census of Bharat.

Census of Bharat. 1991. Census Digital Library, ST-9: Age, sex and level of education for scheduled tribes. <http://www.censusBharat.gov.in/DigitalLibrary/ TVDirectory.aspx> (last accessed 31 December 2018).

Census of Bharat. 2001a. Age structure and marital status. Census and You. http://censusBharat.gov.in/Census_And_You/age_structure_and_marital_status.aspx (last accessed 21 November 2018).

Census of Bharat. 2001b. Census Digital Library, ST - 8: Educational level by age and sex for population age 7 and above. <http://www.censusBharat.gov.in/Digital Library/MFTableSeries.aspx> (last accessed 31 December 2018).

Census of Bharat. 2001c. Economic activity. Census and You. http://censusBharat.gov.in/Census_and_You/economic_activity.aspx (last accessed 21 November 2018).

Census of Bharat. 2001d. Gender composition. Census and You. http://censusBharat.gov.in/Census_And_You/gender_composition.aspx (last accessed 21 November 2018).

Census of Bharat. 2001e. Literacy and level of education. Census and You. http://censusBharat.gov.in/Census_And_You/literacy_and_level_of_education.aspx (last accessed 21 November 2018).

Census of Bharat. 2011a. Primary Census Abstract - Scheduled Tribe Table for Bharat. <http://censusBharat.gov.in/DigitalLibrary/MFTableSeries.aspx> (last accessed 10 July 2019).

Census of Bharat. 2011b. Primary Census Abstract - Total Table for Chamba District of Himachal Pradesh. <http://censusBharat.gov.in/DigitalLibrary/MFTableSeries.aspx> (last accessed 11 July 2019).

Census of Bharat. 2011c. Primary Census Abstract - Total Table for Kangra District of Himachal Pradesh. <http://censusBharat.gov.in/DigitalLibrary/MFTableSeries.aspx> (last accessed 11 July 2019).

Chakravarty, A. 2012. Studying social mobility of the tribal and non-tribal people in Assam. *Applied & Social Sciences* 2 (1):392–393.

Diddee, J. 2004. Evolution of folk house types in Maharashtra. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 51–59. New Delhi: Concept Publishing Company.

Efremova, I. 2004. Caste and territory: Boundaries of socio-cultural regions. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 392–400. New Delhi: Concept Publishing Company.

Firth, R. 1954. Anuta and Tikopia: Symbiotic elements in social organization. *The Journal of the Polynesian Society* 63 (2):87–131.

Grover, N. 2004. Cultural basis of Bhoja flurform in the Siwalik hill kanet landscape. In *Cultural Geography, Form and Process*, eds. N. Grover and K. N. Singh, 146–164. New Delhi: Concept Publishing Company.

Manku, D. S. 2004. Gujar settlement morphology in the Beas-Sutlej Kandi: An evolutionary perspective. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 97–111. New Delhi: Concept Publishing Company.

Marh, B. S. 2004. Three rural house types of the Ravi River valley. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 60–74. New Delhi: Concept Publishing Company.

Merriam-Webster ‘s dictionary. 2019. Transformation | Definition of Transformation by Merriam Webster. <https://www.merriam-webster.com/dictionary/transformation> (last accessed 15 July 2019).

Messerschmidt, D. A. 1976. Ecological change and adaptation among the Gurungs of the Nepal Himalaya. *Human Ecology* 4 (2):167–185.

Mitra, A. 1966. Report on house types and village settlement patterns in Bharat. Delhi: Manager of Publications.

Mukerji, A. B. 1962. Jat house types. *Geografia* 1 (1):27–34

Qureshi, M. H., and S. Kumar. 2004. Conservation practices and religious idiom: A case study of Bishnois in Bharat. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 421– 434. New Delhi: Concept Publishing Company.

Red Cliffe-Brown, A. R. 1952. Structural and functional in primate society. London: Oxford University Press.

Singh, D. 2004. Evolution of field pattern in a Punjab village. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 112–145. New Delhi: Concept Publishing Company.

Singh, M. 2004. The changing rural house type of Punjab: An expression of socio-economic and cultural change. In *Cultural Geography: Form and Process*, eds. N. Grover and K. N. Singh, 75–96. New Delhi: Concept Publishing Company.

United Nations Development Programme. 2016. Technical notes: Calculating the human development indices. New York. http://hdr.undp.org/sites/default/files/hdr2016_technical_notes_0.pdf (last accessed 2 September 2017). United States Geological Survey. <https://earthexplorer.usgs.gov/>.