



## Environment and Culture: Adaptations that have Shaped Nepal

Anu Rai\*

### Abstract

Nepal has a wide variety of environmental conditions owing to its unique geographical position, wide ranging altitude (59 m to 8848.86 m), and diverse climatic conditions. To adapt to such environmental conditions, different cultural practices have been adopted; specific cultures enabled harmonization with the environment. In this study, I have discussed how different cultural practices came into being because of diverse environmental conditions in Nepal. I have shed light on select cultural practices of different ethnic groups enabling adaptation to the environment. Conversely, I have also provided instances of how cultural practices have shaped the environment settings. To undertake this study, I have employed literature review on ecological anthropology of Nepal. Key Informant Interviews and observations have further complemented the study. The study helps to understand the prominent role of environmental conditions in shaping cultural practice in Nepal. This informs the cultural resilience that Nepalese society have exhibited over time and provides an appreciation of environmental cultural relations.

**Keywords:** environment, culture, ecological anthropology, Nepali society, influence, adaptation, change

### Introduction

Ecological anthropology investigates the ways culture enabled humans adaptation to their surrounding and the subsequent use of cultural elements to maintain their environment (Moran, 2008; Kottak, 2011). As global debates on these phenomena ensued, studies in Nepal mostly focused on separate fields either as cultural or ecological elements and not as interactive units for a long time. Nepal is a highly diverse country in terms of both environment and culture meriting an exploration of environment-cultural relations. Such explorations could enable development of extended models of sustainability and shed light on close connections of nature and humans.

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\* CEO, Sustainability and Environmental Studies Endeavor, MSc Student, Environmental Science  
Email ID : [raianu191@gmail.com](mailto:raianu191@gmail.com)

Nepal harbors a great variety of landscape featuring both the highest terrestrial ecosystems - the Himalayas to the tropical forests in its foothills. Nepal features a unique geographic position incorporating two biogeographical regions: Palearctic and Indo-Malayan. It features diverse climatic conditions –tropical, subtropical, temperate, subalpine, and alpine. Nepal features the second largest elevation gradient lagging behind only China with an elevation ranging from 59 m to the world’s highest point at 8848.86 m : all this within an average width of 193 km and average length of 885 km. Consequently, this has led to a high habitat variation in Nepal featuring 118 ecosystems along with 75 vegetation types, 35 forest types, and 11 bioclimatic zones (Dobremez, 1972, 1976).

To respond to such varying environmental conditions, people adopted several cultural practices and also used elements in their culture to maintain their ecosystem. Broadly, the Nepalese population has been classified into three ethnic groups based on their origin which includes the Indo-Nepalese (groups migrating from India and mostly inhabiting the lower hills and Terai plains), the Tibeto-Nepalese (groups migrating from northern region and mostly inhabiting higher hills and the Himalayan region), and the indigenous communities (groups whose habitations predate the arrival of either of these groups) (Savada, 1991). While the CBS (2014) classifies ethnicity into nine broad cultural categories or twelve broad social groups (excluding foreigners), these classifications include people of many ethnicities. 125 ethnic groups have been reported in Nepal (CBS, 2012) and the elements of different responses can be found in various ethnic groups.

**Methodology**

In this study, I have discussed how different cultural practices came into being owing to diverse environmental conditions and also how people have used elements in their culture to change or maintain their ecosystem. The study has employed literature review, observation and Key Informant Interviews (KII) to underline the interaction of environment and culture (Figure 1). Literature review on the development of ecological anthropology along with the studies in ecological anthropology of Nepal have been conducted. Observations arising from my field work at Bardia have also been illustrated. KII has also been conducted with a cultural journalist and two researchers to complement this study.

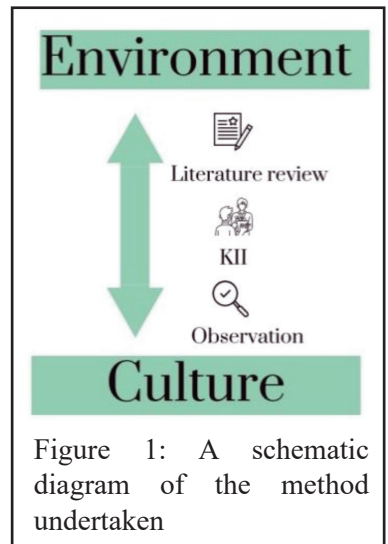


Figure 1: A schematic diagram of the method undertaken

The study has been divided into five parts. The first part consists of literature review on the development of ecological anthropology and the studies in ecological anthropology of Nepal. The second part provides evidence on the effect of the environment on culture in Nepal. The third part highlights the role played by culture in shaping the environment. Then, cultural resilience and changes in cultural practices seen in Nepal is highlighted. Finally, the last part references some other facets of adaptation and stresses need for cultural conservation and reformation.

However, the study is by no account a complete overview of the environment and culture relationship in Nepal. The instances provided represent a snapshot of the narrative of how the environment has shaped culture and vice-versa. During the course of the interviews, it was pointed out to focus on one specific event, culture, region, or phenomenon rather than a holistic approach when discussing cultural scenarios. Despite the recommendations, I have still moved forward trying to frame cultural settings with an environmental lens in a broader frame which has certainly overlooked complexities inherent in environment-cultural relations. Besides, there are other facets of adaptations other than environment-cultural relations which I will briefly elaborate towards the end.

## **Literature Review**

Ecological anthropology has its roots from the studies in environmental determinism, possibilism, and cultural ecology to name a few. Right from the Greco-Roman to the early part of twentieth century, explanation assigning one factor dominating influence of the whole system had garnered momentum (Moran, 2008). It initially started out as environmental determinism which claims that physical attributes of the environment, such as landscapes and climate have significant influence on humans with favorable geoclimatic condition granting superiority. Inspired by the Darwinian theory of evolution, human adaptation also came to be put under the lens of natural environment. However, the theory came under scrutiny as it gave way to encouragement of racism, colonialism, Eurocentrism, and imperialism (Frenkel, 1992; Blaut, 1999).

Cultural determinism or environmental possibilism, or simply possibilism theory, then came into being stating that society is not completely influenced by the environment and that it does not completely control culture. It viewed the environment as a static factor with culture shaping features in human communities. This also came under scrutiny with subsequent studies highlighting the interaction between environment and culture being inherently complex making generalization unprofitable (Kroeber, 1939). These paved the way for development of cultural ecology as a way of understanding human adaptation to the environment, eventually giving way to ecological anthropology for a more scientific inquiry.

In Nepal, environmental and culture interactions were found written under a number of pretenses – cultural ecology, historical anthropology, human ecology, symbolic ecology etc. A comprehensive study on this phenomenon was not found but discrete ethnic groups have been studied at different time scales. The studies have focused on certain customs and celebrations, for instance, the celebration of Udhali and Ubhali by Kirat communities (Dahal, 2021) or seasonality showing interconnectedness with social life of the Gurung ethnic groups in Nhason Valley (Poudel, 2020). Studies have been conducted on different scales, with some concerning particular locale such as Jyulel and Pawai inhabiting Jumla (Luintel, 2013) or some conducted on regional scale, such as considering migratory life of Dhimals of eastern Terai (Rai, 2015). Hence, studies of environmental and culture interaction in Nepal have been specific, not falling into generalization.

## **Environment affecting culture**

In Nepal, environment has played a prominent role in shaping culture. I am elaborating this effect in two ways: controlling the spread of practices or providing conducive conditions for certain practices.

**Environment controlling spread of practices**

Environment has been a limiting factor in spreading religion and culture practice in Nepal. It has been opined that the spread of Hinduism has been controlled in the northern regions of Nepal owing to climatic reason. The Jyulel and Pawai inhabiting Jumla also speaks highly of how the environment can bound cultural practices.

Speculation about Hinduism not spreading in the Himalayan region owing to environmental restrictions has been raised by Bista (1995). While this is not true, as Hinduism is still the highest followed religion in Nepal including the Himalayan region (CBS, 2012), the proportion in its followers certainly dwindles (Figure 2). The population following Buddhism, Kirat, Prakriti, and Bon (in totality) in the Eastern and Western mountains is even higher than the Hindu population. The conversion in Hinduism started after the arrival of Brahmin priests from India (Bista, 1995). On their quest of converting various populations in Nepal into Hindus their efforts have been somewhat curtailed in the northern reaches. Hinduism requires frequent baths for rituals and conditions which was not really possible during that time because of colder conditions, lack of easy access to water etc. Buddhism, Kirat, Prakriti, and Bon having more animistic features were able to maintain their hold in these regions.

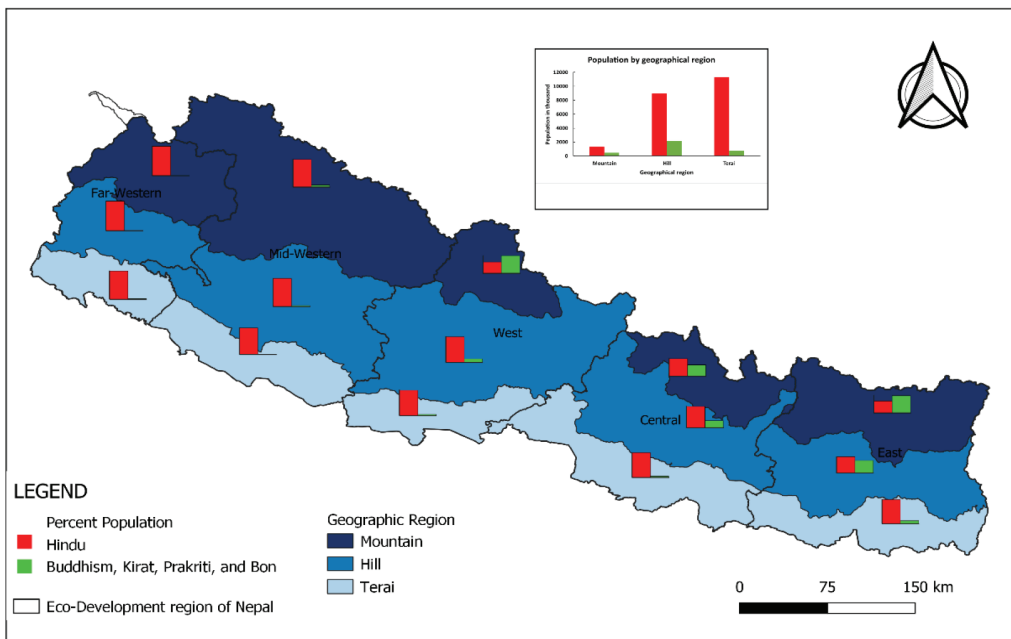


Figure 2: Population following different religions in Nepal based on CBS (2012).

Likewise, the Jyulel and Pawai inhabiting Jumla provide an instance on how the environment limits the spread of cultural practice. Sage Chandan Nath introduced a rice variant called marsi in Jumla which was adopted by Jyulel caste. This caused a change in their cultural practice, adopting a customary calendar revolving around paddy cultivation. This became intertwined in their religious duty as such, even migrants were expected to return by 12 Chaitra for participation in plantation (Luintel, 2013). Absence to such an event even marked funeral

rites being performed assuming their death. However, the Pawai inhabiting the high elevation and undertaking dry cultivation have carried on with their ancient practices without being bounded in a similar fashion as Jyulel.

### ***Environmental conditions conducive of cultural practices***

Environment conditions also make it conducive to adapt practices which later become a defining part of culture. Seasonal migration or a migratory village life had been infused with the way of living for many. Tapping into such migration patterns helped to work with the ecological limits and carrying capacity of nature. Migration is seen throughout different geographic regions of Nepal in the Sherpa, Gurung, Rai, and Dhimals to name a few. Likewise, in some ethnicity family structures have also been attributed to environmental settings like in the Rana Tharu households.

Sherpas have a complex agro-pastoral-trade strategy which has allowed them to reap the benefits even in the most challenging environmental conditions (Spoon, 2013). Such seasonal migration allows for use of different ecotones allowing procurement of resources from the environment or the people. The Kirat ethnic groups, follow two distinct migrations, bounded by the rituals of Udhauli and Ubhauli. Udhauli marks migration downwards and falls around November while Ubhauli falling around April marks migration upwards. In winter, protection from cold in addition to management of scarce resources became a problem; therefore, the movement along with the cattle in the low elevation of Arun valley became a necessity. When the summer arrived, the movement was upwards so as to avoid high temperatures and to be protected from diseases like malaria (Dahal, 2021). Thus, this migration helped to maintain equilibria with resources.

Besides, in the Gurung ethnic group of the Nhason Valley, seasonality shows much interconnectedness with social life (Poudel, 2020). The activities of both the farmers and herders are in sync with the weather patterns. Planting, harvesting, ritual arrangement, social life, and movement of livestock are all based on the weather patterns. *Kuinsho* or the time of snowfall, for instance, is when the young generations start to learn weaving as the free time after harvesting summer crop and sowing of winter crops (Poudel, 2020).

However, in Dhimals (also considered a Kirati ethnic group living in Terai) a contrast to their culture and way of living can be found. The Dhimals in the Terai lived a migratory village life following resource availability, outbreaks of diseases and threats of wildlife (Rai, 2015). Their life was ingrained in the environmental settings which continued till the recent past. Even to this day many are landless albeit being the primary residents of eastern Terai.

Moreover, in Kanchanpur district of Nepal the environmental settings have played a major role in the family structure of Rana Tharu (Lam, 2015). *Badaghar* which literally means big house was predominant. Even families over three generations consisting of even forty members resided together. Prior to 1950s, the presence of dense forests and an abundance of land resource necessitated a large joint-type household. A large labor force was a necessity to clear the forest but this was scarce. However, a large family provided the work force required along with social security, love and bond among the members. Hence, this allowed lessening of burdens among the family members as it could be shared amongst all.

## Culture affecting environment

People have used the elements in their culture to change or maintain their ecosystem which is a central premise in ecological anthropology. Here I present how animistic practices have allowed for conservation to flourish in Nepal. An observation account of Krishnasar is presented. The practice of Farmer Managed Irrigation System (FMIS) is also highlighted. Besides, hunting culture practiced in Nepal is elaborated.

Nepal is home to various animistic practices comprising of worship of rivers, forest, and animals. Such practices have enabled protection and conservation of these components. Globally 30% of land is already conserved by indigenous people and this coverage is greater than the ones covered by the protected areas (ICCA Consortium, 2021). Indigenous population makes up 35.8% of Nepal's population (GoN, 2018) and many adhere to conservation practices in their own traditional ways. The Tsumbas of the Tsum Valley follow the culture of 'Shyagya' which is a culture of non-violence. It is prohibited to kill or hunt, collect honey, sell animals to butchers, trap animals/birds, trade meat, and burn forest in the Upper Tsum Valley. The persistent collective action of the Tsumbas has enabled conservation. Likewise, Bon monasteries have provided safe spaces for wildlife including musk deer, blue sheep, snow leopards, wolves etc. (Li et al., 2014; Weise & Joshi, 2022). Thasang Tholing, a Bon monastery which sits atop a cliff above Lake Phoksundo was established to prevent people from chasing wildlife to the edge of the cliff for meat as killing was forbidden. As a result, the establishment has acted like a religious warden to prevent prohibited acts and protect wildlife, restoring an ecological balance (Lama, 2019).

Similarly, another cultural aspect in Nepal has enabled conservation of nationally Critically Endangered species. Blackbucks or Krishnasar in Nepal represent the northernmost surviving herd. Its decline was mostly due to excessive hunting. The species was thought to be extinct until a few individuals were noticed in Bardia (Dinerstein, 1975) and Banke (Wegge & Wilson, 1976). In Khairapur, Bardia the population has increased from 9 individuals to 252 in 2016 and the species has also been translocated to other protected areas of Nepal (KrCA, 2017). The species survived in that particular place for a reason. The place is inhabited by Yadav who worship the species. Krishnasar is a blend of two words – "Krishna" and "shyahaar" meaning cared by Lord Krishna. Lord Krishna is a major Hindu deity and Yadav have a deep reverence towards Lord Krishna. Hence, they care for these animals as well. Combined with the care was the factor that the Yadav are vegetarians, further contributing to protection of the species.

Taking a page from Ostrom's Common Pool Resource (CPR), we find the practice of Farmer Managed Irrigation System (FMIS) in Nepal. The systems evolved for managing water for irrigation. Water is a CPR which is open access but an individual's use subtracts from the quantity of resource units available to others (Ostrom et al., 1994). So, to manage this resource, self-organization and self-regulation has been practiced through an institutional mechanism of FMIS. Recognizing mutual dependencies, the farmers have been able to craft rules leading to a higher yield in Nepal (Ostrom & Gardner, 1993).

Besides, in Nepal, hunting culture is practiced by various ethnicities. These include the element of worship of deity before and after a hunt. Santhal or Satar community of eastern Nepal engage in the traditional hunt of small mammals, birds, fishes etc. for meat and refreshment which also helps to strengthen their social bond (Kharel et al., 2019). It is practiced during special occasions like ‘Papni’ or ‘Hakukatkam’ and ‘Sakrat’ festivals as well as a way of life (Kharel et al., 2019). Likewise, honey hunting is practiced by the Gurung and Kulung ethnic groups and is believed to be guided by the guardian spirit. It is performed twice a year and is integrated with the local culture and festival celebrations. However, these practices affects wildlife by harming endangered species and causing wildlife population decline (Kharel et al., 2019; Joshi & Gurung, 2005).

### ***Cultural resilience and alteration***

Culture is always changing driven by political-economic process, philosophical ideologies, technological advancement, amongst others. Now, combined with the fact that the environment itself is changing due to climate change, we have cultures that are adapting, evolving, and modifying. In the midst of environment influencing culture and culture influencing environment, diversity has also arisen due to a close cultural proximity with different cultural groups. The seasonal migration patterns have also changed or are changing.

An excellent example of this is the Maithil Brahmins mostly bearing the surnames of Jha and Mishra residing in the core areas of Kathmandu Valley. They have originally migrated from Tirhut and through migration, adaptation and evolution, have a unique cultural identity. A discussion with a fellow Mishra revealed that there are differences in food taken – the ones in Kathmandu valley taking in a more protein based diet as opposed to their counterparts in the plains and organization of ceremonies and rituals – the ones in Kathmandu valley mostly organizing events during the spring avoiding cold weather while the ones in the plains not bearing such restrictions. Their cultural practice have also further taken in Newa festivals such as Ya: Mari Punhi and Siti Nakha.

Likewise, the original purpose of Ubhauri and Udhauri celebration as seasonal migration is not completely reflective of the Kirat community now as they have diversified into different occupations and hence different ways of life. But the celebrations still carry the benefit of bringing together members of the community where some migrate to the lowland temporarily or get recruited in the British or the Indian Army (Dahal, 2021). The seasonal migration has also changed into other forms of social mobility. The wealthy families of Nhāson now seasonally migrate to avoid cold weather (Poudel, 2020). Transhumance herding is overall in crisis due to stricter trading controls with Tibet, modernization making way into community lives, forage availability or rather its unavailability etc.

Besides, new meanings, identities, and symbols are being crafted. For instance, yak festival is being organized in Panchthar where the accommodations are in ‘gothstay’: traditionally a place of living for herders but now serving as touristic sites for learnings about Himalayan life and pastoral culture (Poudel et al., 2022). This has taken a new form of eco-tourism opportunity. In Mustang, celebration of yak blood drinking event occurs. Buddhism in these parts prohibits its followers from killing. However, meat from an animal which has

died by accident is allowed to be consumed. Mark Turin, an anthropologist has opined that the festival served a way to sometimes over-bleed yaks, leading to its death and provision of meat (Godoy, 2012). With the belief that yak blood bears healing features, the festival has become a lucrative business (Hellman, 2019). Honey hunting has also evolved into a harvest of hallucinogenic honey with growing international demands and honey hunting exhibitions fetching good income despite declining bee population (Perichon & Bhatta, 2019; Thapa et al., 2018).

### **Other facets of adaptation and need for cultural conservation and reformation**

Apart from the environment-cultural relations, adaptations also have other facets. In Nepal, variations in environment have also induced change in the genetic makeup. Also, the complex culture adaptation that came into being as a result of the environmental settings are also facing critiques, calling for need for cultural conservation and reformation.

The variations in environmental condition have also given rise to unique genetic adaptations. Classic examples of such variations are found in the Sherpa and Tharu ethnic groups. Sherpas have exhibited high altitude adaptations whereas Tharus have exhibited high resistance to malaria.

A metabolic basis of Sherpas' adaptation to survive and perform at high altitude has been established. In comparison to lowlanders, Sherpas are shown to have improved muscle energetics along with protection against oxidative stress brought on by a selection of gene (Horscroft et al., 2017). This adaptation is speculated to have underpinned superior performance of elite Sherpa climbers. Likewise, Tharus who have lived for centuries in Terai which had been infested with malaria have exhibited high resistance to malaria. The resistance is owed due to high frequency of  $\alpha$ -thalassemia, a malaria protective gene (Modiano et al., 1991).

### **Need for cultural conservation and reformation**

Intrusion of modern life, changing relations of people with nature combined with many other factors are leading to cultural changes. While culture is never static evolving alongside changing times, some elements of culture such as language are severely endangered in Nepal. Likewise, harmful practices shouldn't continue unchecked. Reformations need also be sought so as to preserve the knowledge and skills of particular groups without harming natural elements.

Language is a significant part of any culture and it also encodes particular subset of knowledge relating to botany, medicine, agriculture, and ecology. Loss of language is assessed to trigger loss of unique medical plant knowledge (Cámara-Leret & Bascombe, 2021). In Nepal, more than 100 mother tongues are severely endangered, possibly remaining only as a remnant of symbolic identity (Turin, 2007). Hence, language need to be preserved as a cultural element and also for protection of knowledge.

Likewise, new avenues of keeping culture alive through eco-tourism opportunities such as 'gothstay' needs to be promoted. Additionally, as the biodiversity crisis is raging on, it is important to find reformation in hunting culture. Global debates on manifestation of hunting culture as intangible cultural heritage are waging on with reformations as "innovative hunting management model" are being called upon (Dajczak et al., 2021).



## Conclusion

Environment has a bearing on species survival and its evolution and this seems true to even cultural practices - controlling, promoting, and changing them. In Nepal, environmental settings have played an important role in shaping culture by controlling practices such as limiting Hinduism spread in the Himalayan region or bounding Jyulel to the customary calendar for paddy cultivation. It has also provided conducive conditions for certain practices such as influencing migratory patterns and family structures. Besides, environment settings have also led to adaptations, including genetic adaptations as exhibited by various ethnic groups in Nepal.

The culture itself has also deeply influenced and shaped the environment, enabling conservation through the practice of animistic features, promoting resource use for instance water as a communal property and hunting of wildlife. The culture has also evolved with the increasing intrusion of modern life, change in human interaction with nature etc. The seasonal flow which allowed for harmonic order between humans and resources is a vanishing lifestyle now. But even though the ecological reasoning and the practice itself are disappearing, the cultural practices serve as a useful reminder. As new avenues of keeping culture alive through tourism opportunities are explored, the culture will certainly change. Some of the changes will be a necessity to ensure continuity of culture, such as cultural hunting practices.

## References

- Bista, D. B. (1995). *Fatalism and Development: Nepal's Struggle for Modernization*. Orient Longman.
- Blaut, J. M. (1999). Environmentalism and Eurocentrism. *Geographical Review*, 89(3), 391–408. <https://doi.org/10.1111/j.1931-0846.1999.tb00225.x>
- Cámara-Leret, R., & Bascompte, J. (2021). Language extinction triggers the loss of unique medicinal knowledge. *Proceedings of the National Academy of Sciences*, 118(24), e2103683118. <https://doi.org/10.1073/pnas.2103683118>
- CBS. (2012). *National Population and Housing Census 2011 (National Report)*. Central Bureau of Statistics.
- CBS. (2014). *Population monograph of Nepal: Volume II: Social demography*. Central Bureau of Statistics.
- Dahal, B. P. (2021). Ubhauri and Udhauri: Application of Symbolic Ecology and Ecological Symbolism in Kirat-Rai in Eastern Nepal. *Patan Pragya*, 9(02), 02. <https://doi.org/10.3126/pragya.v9i02.42005>
- Dajczak, W., Gwiazdowicz, D. J., Matulewska, A., & Szafranski, W. (2021). Should Hunting as a Cultural Heritage Be Protected? *International Journal for the Semiotics of Law - Revue Internationale de Sémiotique Juridique*, 34(3), 803–838. <https://doi.org/10.1007/s11196-020-09763-0>
- Dinerstein, E. (1975). *A status report on the Blackbuck of Banke district*. Report. Department of National Parks and Wildlife Conservation.

- Dobremez, J. F. (1976). *Nepal: Ecology and biogeography*. Éditions du Centre national de la recherche scientifique.
- Dobremez, J.-F. (1972). Les grandes divisions phytogéographiques du Népal et de l'Himalaya. *Bulletin de La Société Botanique de France*, 119(1–2), 111–120.
- Frenkel, S. (1992). Geography, Empire, and Environmental Determinism. *Geographical Review*, 82(2), 143–153. <https://doi.org/10.2307/215428>
- Godoy, M. (2012). The Truth About Nepal's Blood-Drinking Festivals. *NPR*. <https://www.npr.org/sections/thesalt/2012/10/28/163835175/the-truth-about-nepals-blood-drinking-festivals>
- GoN. (2018). *Alternative Report of the Indigenous Peoples of Nepal*. Government of Nepal. [https://tbinternet.ohchr.org/Treaties/CERD/Shared%20Documents/NPL/INT\\_CERD\\_NGO\\_NPL\\_30811\\_E.pdf](https://tbinternet.ohchr.org/Treaties/CERD/Shared%20Documents/NPL/INT_CERD_NGO_NPL_30811_E.pdf)
- Hellman, R. (2019). *The Last Yak Song: A Recount of the Decline of Pastoral Herding in Lower Mustang*. Independent Study Project (ISP) Collection. [https://digitalcollections.sit.edu/isp\\_collection/3185](https://digitalcollections.sit.edu/isp_collection/3185)
- Horscroft, J. A., Kotwica, A. O., Laner, V., West, J. A., Hennis, P. J., Levett, D. Z. H., Howard, D. J., Fernandez, B. O., Burgess, S. L., Ament, Z., Gilbert-Kawai, E. T., Vercueil, A., Landis, B. D., Mitchell, K., Mythen, M. G., Branco, C., Johnson, R. S., Feelisch, M., Montgomery, H. E., ... Murray, A. J. (2017). Metabolic basis to Sherpa altitude adaptation. *Proceedings of the National Academy of Sciences*, 114(24), 6382–6387. <https://doi.org/10.1073/pnas.1700527114>
- ICCA Consortium. (2021). *Territories of Life: 2021 Report*. ICCA Consortium: Worldwide. <https://report.territoriesoflife.org/wp-content/uploads/2021/09/ICCA-Territories-of-Life-2021-Report-FULL-150dpi-ENG.pdf>
- Joshi, S. R., & Gurung, M. B. (2005). Non-destructive method of honey hunting. *Bee World*, 86(3), 63–64. <https://doi.org/10.1080/0005772X.2005.11417313>
- Kharel, M., Subba, A., & Tamang, G. (2019). Traditional hunting tools of Santhal (Satar) community of Jhapa district, Province No.1, South -East Nepal. *International Journal of Advanced Research in Biological Sciences*, 6(6), 194-204. <https://doi.org/10.22192/ijarbs.2019.06.06.023>
- Kottak, C. P. (2011). *Anthropology: Appreciating human diversity*. McGraw-Hill.
- KrCA. (2017). *KrCA Management Plan*. Krishnasaar Conservation Area Office. [https://dnpwc.gov.np/media/publication/KrCA\\_Management\\_Plan.pdf](https://dnpwc.gov.np/media/publication/KrCA_Management_Plan.pdf)
- Kroeber, A. L. (1939). *Cultural and Natural Areas of Native North America*. University of California Press.
- Lam, L. M. (2015). Environment, livelihood and household: The ethno-history of Rana Tharus Badaghar households. *The Australian Journal of Anthropology*, 26(2), 293–312.

<https://doi.org/10.1111/taja.12136>

- Lama, S. C. (2019). Bon voyage. *Nepali Times*. <https://www.nepalitimes.com/banner/bon-voyage/>
- Li, J., Wang, D., Yin, H., Zhaxi, D., Jiagong, Z., Schaller, G. B., Mishra, C., McCarthy, T. M., Wang, H., Wu, L., Xiao, L., Basang, L., Zhang, Y., Zhou, Y., & Lu, Z. (2014). Role of Tibetan Buddhist monasteries in snow leopard conservation. *Conservation Biology: The Journal of the Society for Conservation Biology*, 28(1), 87–94. <https://doi.org/10.1111/cobi.12135>
- Luintel, Y. R. (2013). Locating Pawai in the Social Hierarchy of the Khasa: A Preliminary Note on Jumli Caste Structure. *Dhaulagiri Journal of Sociology and Anthropology*, 7, 31–50. <https://doi.org/10.3126/dsaj.v7i0.10436>
- Modiano, G., Morpurgo, G., Terrenato, L., Novelletto, A., Di Rienzo, A., Colombo, B., Purpura, M., Mariani, M., Santachiara-Benerecetti, S., Brega, A., Dixit, K. A., Shrestha, S. L., Lania, A., Wanachiwanawin, W., & Luzzatto, L. (1991). Protection against malaria morbidity: Near-fixation of the  $\alpha$ -thalassemia gene in a Nepalese population. *American Journal of Human Genetics*, 48(2), 390–397.
- Moran, E. F. (2008). *Human adaptability: An introduction to ecological anthropology* (3rd ed.). Westview Press.
- Ostrom, E., & Gardner, R. (1993). Coping with Asymmetries in the Commons: Self-Governing Irrigation Systems Can Work. *The Journal of Economic Perspectives*, 7(4), 93–112.
- Ostrom, E., Gardner, R., Walker, J., Walker, J. M., & Walker, J. (1994). *Rules, games, and common-pool resources*. University of Michigan Press.
- Perichon, S., & Bhatta, C. (2019). Honey Gathering (*Apis laboriosa*) and Beekeeping (*A. cerana*) in the Annapurna Conservation Area – Nepal. *Bee World*, 96(3), 69–74. <https://doi.org/10.1080/0005772X.2019.1604298>
- Poudel, J. M. (2020). The rhythms of life in the Himalaya: Seasonality and sociality among the Gurung people of the Nhāson Valley. *International Journal of Anthropology and Ethnology*, 4(1), 10. <https://doi.org/10.1186/s41257-020-00036-z>
- Poudel, J. M., Paudyal, S., Shiwakoti, S., & Gurung, S. (2022). Moving Yak Herds towards Tourism: A Linkage between Yak and Eco- Tourism in the High Mountains of East on Nepal. *Journal of Tourism and Himalayan Adventures*, 4(1), 46–62. <https://doi.org/10.3126/jtha.v4i1.46301>
- Rai, J. (2015). “Owning Land Was So Much of DuhKha In the Past”: Land and the State-Adivasi Relations in the Tarai, Nepal. *Studies in Nepali History and Society*, 20, 69–98.
- Savada, A. M. (1991). *Nepal: A Country Study*. Washington: GPO for the Library of Congress. <http://countrystudies.us/nepal/>
- Spoon, J. (2013). From Yaks to Tourists: Sherpa Livelihood Adaptations in Sagarmatha (Mount Everest) National Park and Buffer Zone, Nepal. In L. R. Lozny (Ed.), *Continuity and*

*Change in Cultural Adaptation to Mountain Environments* (Vol. 7, pp. 319–339). Springer New York. [https://doi.org/10.1007/978-1-4614-5702-2\\_13](https://doi.org/10.1007/978-1-4614-5702-2_13)

Thapa, R., Aryal, S., & Jung, C. (2018). Beekeeping and Honey Hunting in Nepal: Current Status and Future Perspectives. In P. Chantawannakul, G. Williams, & P. Neumann (Eds.), *Asian Beekeeping in the 21st Century* (pp. 111–127). Springer Singapore. [https://doi.org/10.1007/978-981-10-8222-1\\_5](https://doi.org/10.1007/978-981-10-8222-1_5)

Turin, M. (2007). *Linguistic Diversity and the Preservation of Endangered Languages*. ICIMOD. <https://lib.icimod.org/record/7884>

Wegge, P., & Wilson, P. (1976). *The Blackbuck in Banke district*. Report to HMGN. Kathmandu

Weise, K., & Joshi, A. (2022). A Himalayan Landscape Shared by Bon-po Monks and Snow Leopards: Upper Dolpo, Nepal. In K. Silva (Eds.), *The Routledge Handbook of Cultural Landscape Heritage in The Asia-Pacific*. Routledge.