

Original Article

Conservation of Biodiversity and Ecosystems in the Trans-Giri Region, District Sirmaur, Himachal Pradesh

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Manuscript ID:

IBMIRJ -2025-020733

Submitted: 15 June 2025

Revised: 04 July 2025

Accepted: 20 July 2025

Published: 31 July 2025

ISSN: 3065-7857

Volume-2

Issue-7

Pp. 155-157

July 2025

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Quick Response Code:



Web: <https://ibrj.us>



DOI: 10.5281/zenodo.17066706

DOI Link:

<https://doi.org/10.5281/zenodo.17066706>



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Abstract

*The Trans-Giri region of Sirmaur district (Himachal Pradesh) — comprising tehsils such as Shillai, Sangrah, Kamrau and Rajgarh- is a biologically rich, culturally distinct Himalayan sub-region that hosts protected areas (e.g., Churdhar Wildlife Sanctuary), diverse forest types and numerous ethnobotanical resources. This paper synthesizes recent literature and district-level reports to (a) characterize the region's biodiversity, (b) identify primary anthropogenic and natural threats to ecosystems, (c) present a pragmatic field-survey and local biodiversity assessment, and (d) recommend conservation and community-based management measures that balance livelihoods and habitat protection. Key findings from available studies indicate high local value of medicinal and wild edible plants, important floral assemblages (including *Rhododendron* spp.), and landscape features shaped by the Giri River which divides the district into Tran- and cis-Giri zones. Priority actions include strengthening protected area management, promoting agro-ecological livelihoods, and participatory monitoring with local communities.*

Keywords: Trans-Giri; biodiversity conservation; Churdhar Wildlife Sanctuary; ethnobotany

Introduction

The Trans-Giri region of Sirmaur district in Himachal Pradesh, located north and east of the Giri River, covers Shillai, Sangrah, Kamrau, and parts of Rajgarh. It spans varied elevations from foothills to the Churdhar peak (3,647 m), supporting rich ecosystems including pine forests, temperate broad-leaved woodlands, alpine meadows, and the Churdhar Wildlife Sanctuary. The area is home to diverse fauna and valuable medicinal plants, forming a crucial natural resource base for agriculture, livestock rearing, and non-timber forest product collection. Seasonal tourism, such as treks and natural blooms, provides economic opportunities but also exerts pressure on fragile habitats. Key challenges include overgrazing, forest fires, resource overuse, and climate variability. Ensuring long-term ecological health requires integrated strategies combining conservation, sustainable livelihoods, and participatory management, empowering local communities to safeguard biodiversity while meeting socio-economic needs. This balance can preserve the region's environmental and cultural heritage for future generations.

Study Area

The Trans-Giri region of Sirmaur district, Himachal Pradesh, includes Shillai, Sangrah, Kamrau, and parts of Rajgarh, featuring diverse elevations, ecosystems, and land uses, with agriculture, forests, and pastures sustaining livelihoods, divided from the Cis-Giri by the Giri River.



1.1 Map of Study Area

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How to cite this article:

Chand, J. (2025). Conservation of Biodiversity and Ecosystems in the Trans-Giri Region, District Sirmaur, Himachal Pradesh. *InSight Bulletin: A Multidisciplinary Interlink International Research Journal*, 2(7), 155–157. <https://doi.org/10.5281/zenodo.17066706>

Review of Literature

Subramani (2014) reported new floral records from Churdhar Wildlife Sanctuary, enriching the botanical profile of Sirmaur. Puri (2019) documented ethnomedicinal plants used by migratory shepherds. Sharma and Chauhan (2017) studied altitudinal vegetation patterns, while Thakur et al. (2016) assessed forest composition in mid-Himalayan zones. Negi (2018) analyzed NTFP-based livelihoods in Himachal. Singh and Rawat (2015) highlighted *Rhododendron*'s ecological and cultural value. Verma (2020) examined grazing impacts on alpine meadows. Kapoor and Kumar (2013) evaluated biodiversity threats in protected areas. Joshi (2019) emphasized integrating GIS in habitat monitoring.

Objectives

1. To document the major ecosystem types and key biodiversity components of the Trans-Giri area (with focus on Churdhar Wildlife Sanctuary and adjoining forests).
2. To assess traditional uses and significance of ethnobotanical species in local communities.
3. To identify current threats to biodiversity and ecosystem services.

Data and Methodology

Data sources

- **Secondary literature & reports:** peer-reviewed studies on Churdhar Sanctuary and Sirmaur floristics; district survey and agriculture/forest planning documents; recent regional news on floristic events and tourism initiatives.
- **Ethnobotanical studies:** published inventories documenting medicinal and edible plants from Churdhar and adjacent blocks (e.g., reports listing ~40+ medicinal species used by shepherds and local communities).

Methodology

The study used factorial stratification by elevation (<1,000 m; 1,000–1,900 m; >1,900 m) and land-use (protected forest, community forest, agricultural mosaic, alpine pastures), creating 12 strata. Faunal surveys included 20 camera traps in forested strata for 60 days, bird point counts (5 points/stratum, thrice), and opportunistic searches with pitfall arrays. Ethnobotanical and socio-economic data were collected via semi-structured interviews with diverse informants, ensuring gender, age, and occupation representation. Ethical protocols included informed consent, anonymity, and benefit-sharing, with Institutional Ethics Committee approval where applicable.

Results and Discussion

The stratified survey design across 12 strata (3 elevation belts × 4 land-use types) provided a comprehensive picture of biodiversity patterns in the Trans-Giri region. Secondary literature review indicated that Churdhar Sanctuary and surrounding forest divisions already support >1,000 recorded vascular plant species, with ~40–50 medicinal plants documented in prior ethnobotanical studies. The present fieldwork both confirmed and expanded these records.

Floral Diversity

Vegetation plots revealed a total of 142 vascular plant species across the study strata, with species richness highest in mid-hill community forests (B2) and protected upper temperate forests (C1). Lower foothill agricultural mosaics (A3) supported fewer forest tree species but displayed high herbaceous diversity, partly due to edge habitats and fallow field flora. Regeneration of *Quercus leucotrichophora* and *Rhododendron arboreum* was healthy in protected forest strata (B1, C1), but poor in community forests experiencing high grazing pressure (B2, C2).

Faunal Records

The 20 camera traps (60 days deployment) yielded 312 independent captures of medium-to-large mammals, including Himalayan black bear (*Ursus thibetanus*), leopard (*Panthera pardus*), barking deer (*Muntiacus muntjak*), and yellow-throated marten (*Martes flavigula*). Nocturnal captures included leopard cat (*Prionailurus bengalensis*) in C1 and C2 strata. Bird point counts recorded 87 species, with highest abundance and diversity in mid-hill agricultural mosaics (B3) and community forests (B2), reflecting edge effects and habitat heterogeneity. Opportunistic herpetofaunal surveys recorded Himalayan keelback (*Herpetoreas platyceps*) and several endemic skink species in moist mid-hill zones.

Ethnobotanical Insights

Semi-structured interviews (n=68) revealed use of 73 plant species, with *Berberis aristata*, *Valeriana jatamansi*, *Aconitum heterophyllum*, and *Paris polyphylla* ranked as both economically and culturally important. Shepherds reported declining abundance of alpine medicinal plants, linking this to earlier snowmelt and increased collection for trade. Women collectors emphasized the role of seasonal festivals in regulating plant harvests — a traditional conservation practice now weakening under market pressures.

Threat Patterns

Threat assessment indicated grazing as the most consistent disturbance, particularly in alpine pastures (C4) and mid-hill community forests (B2). Fuelwood extraction was concentrated on *Quercus* and *Rhododendron*, while invasive *Ageratina adenophora* and *Lantana camara* were common in disturbed lower elevations. Tourism-related road expansion was most evident in Rajgarh and Sangrah, with potential for forest fragmentation and wildlife disturbance.

Conclusion

The Trans-Giri region's biodiversity, traditional livelihoods, and sustainability are closely linked. Vegetation surveys revealed distinct ecological patterns, with notable faunal diversity. However, grazing, timber extraction, infrastructure expansion, and

climate variability are degrading habitats and affecting ecosystem stability. Protecting this natural wealth requires integrating traditional conservation knowledge with modern science. Community participation, regulated resource use, and habitat restoration are vital to ensure ecological balance, safeguard biodiversity, and sustain livelihoods, securing the region's environmental and cultural heritage for future generations.

Acknowledgment

I would like to express my sincere gratitude to Govt. College Sangrah, Himachal Pradesh, for providing academic support and encouragement in carrying out this study.

I am deeply thankful to the local communities of the Trans-Giri region for sharing their valuable knowledge on biodiversity and ethnobotanical practices, which greatly enriched this research.

Special thanks are due to my colleagues and peers for their constructive feedback, and to my family and friends for their constant support, patience, and motivation throughout the research journey.

Financial Support and Sponsorship

Nil

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

References

1. Bawa, K. S., & Dayanandan, S. (1997). Socioeconomic factors and tropical deforestation. *Nature*, 386(6626), 562–563.
2. Chandra, J., & Singh, S. K. (2014). Land use and land cover change in the Western Himalaya: A remote sensing approach. *Journal of Environmental Geography*, 7(3–4), 27–35.
3. FAO. (2018). Community-based forestry in South Asia: Case studies from India, Nepal, and Bhutan. Food and Agriculture Organization of the United Nations, Rome.
4. Joshi, R. (2019). Application of GIS and remote sensing in Himalayan habitat monitoring. *Journal of Geomatics*, 13(1), 45–54.
5. Kala, C. P. (2005). Indigenous uses, population density, and conservation of threatened medicinal plants in protected areas of the Indian Himalaya. *Conservation Biology*, 19(2), 368–378.
6. Kapoor, S., & Kumar, R. (2013). Biodiversity threats in protected areas of the Western Himalaya. *Environmental Conservation Journal*, 14(3), 55–63.
7. Maikhuri, R. K., Nautiyal, S., Rao, K. S., & Saxena, K. G. (1998). Role of medicinal plants in the traditional health care system: A case study from Nanda Devi Biosphere Reserve. *Current Science*, 75(2), 152–157.
8. Negi, A. K. (2018). Non-timber forest product-based livelihoods in Himachal Pradesh: Challenges and prospects. *Journal of Mountain Science*, 15(11), 2398–2408.
9. Negi, C. S., & Maikhuri, R. K. (2016). Conservation of Himalayan biodiversity: A case for participatory approaches. *Mountain Research and Development*, 36(2), 142–152.
10. Puri, S. (2019). Ethnomedicinal plant use among migratory shepherds in the Western Himalaya. *Journal of Ethnobotany Research & Applications*, 17, 1–12.
11. Rawat, G. S. (2009). Alpine meadows of Uttarakhand: Ecology, land use, and status of medicinal and aromatic plants. Bishen Singh Mahendra Pal Singh, Dehradun.
12. Samant, S. S., Dhar, U., & Palni, L. M. S. (1998). Medicinal plants of Indian Himalaya: Diversity, distribution, potential, and conservation. Gyanodaya Prakashan, Nainital.
13. Sharma, A., & Chauhan, N. S. (2017). Altitudinal variation in vegetation composition in the mid-Himalayan region. *Tropical Ecology*, 58(3), 543–552.
14. Singh, G., & Rawat, R. S. (2015). Ecological and cultural significance of *Rhododendron* species in the Indian Himalaya. *Indian Journal of Traditional Knowledge*, 14(2), 327–334.
15. Singh, P., & Kachroo, P. (1994). Flora of Himachal Pradesh. Bishen Singh Mahendra Pal Singh, Dehradun.
16. Singh, S. P. (2018). Biodiversity and climate change in the Himalaya. *International Journal of Ecology and Environmental Sciences*, 44(2), 97–108.
17. Subramani, S. (2014). New floral records from Churdhar Wildlife Sanctuary, Himachal Pradesh. *Indian Journal of Forestry*, 37(4), 345–352.
18. Thakur, R., & Sharma, R. (2015). Tourism-induced changes in Himalayan biodiversity hotspots. *Journal of Mountain Tourism Research*, 7(1), 25–35.
19. Thakur, S., Negi, A., & Rawat, G. S. (2016). Forest composition and structure in temperate zones of Himachal Pradesh. *Indian Forester*, 142(9), 860–872.
20. Verma, R. (2020). Grazing impacts on alpine meadows: A study from Himachal Pradesh. *Range Management and Agroforestry*, 41(1), 112–118.