



## Designing Resilient Homestay Models: Integrating Health, Environmental Sustainability, and Community Development in Uttarakhand

Shubham Goswami Giri • Surendra Kumar\* • Sneha Maindola

*Department of Business Management, H.N.B. Garhwal Central University, Srinagar (Garhwal), Uttarakhand, India.*

\*Corresponding Author's email Id: [ksurendra02@gmail.com](mailto:ksurendra02@gmail.com)

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**Abstract:** Through exploring health, environmental sustainability, and community development, this study aims to design resilient homestay models in Uttarakhand. The analysis was conducted on 150 homestays drawn through stratified random sampling from the Kumaon and Garhwal regions. A mixed methods approach is used in the study, and a structured questionnaire and semi-structured interviews are used to collect data on health standards, environmental practices, and community development efforts. Quantitative analysis shows that 78 % of homestays had adequate sanitation, 56 % had waste management systems, and 62 % had water conservation practices. Regarding health, only 22% of hosts got regular health checkups, and 35% gave hygiene training to those hosts. Qualitative insights demonstrate that those in Kumaon were more proactive in adopting eco-friendly practices than those in Garhwal, where local economic benefits and cultural preservation were significant. The study builds upon these findings to develop a complete framework which supports sustainable homestays for visitors while benefiting local communities and protecting environmental resources. This research supports the development of complete homestay solutions which address the key issues facing Uttarakhand's tourism industry.

**Keywords:** Homestay Business • Health • Environment Sustainable • Community Development

### Introduction

Uttarakhand's tourism industry has been built around homestays, which give travelers an authentic cultural experience while helping the local communities earn their livelihoods (Samsudin & Maliki, 2015). Uttarakhand, tucked away in the Himalayan region, allows homestays to flourish by promoting local traditions, cuisine, and way of life (Giri & Kumar 2024). Homestays can contribute to sustainable practice beyond tourism in fostering environmental conservation, improving public health standards, and economically and socially empowering host communities (Basak et al. 2021). This dual role—as both tourism facilitators and agents of sustainable development—positions homestays as a critical component of Uttarakhand's socio-economic fabric. (Hills & Bengal 2023)

The homestay ecosystem is growing, but it has its challenges. Essential health, environmental, and community development practices are often not successfully integrated into the many homestays (Giri et al., 2024). There remain issues of inadequate sanitation, poor waste management, and uneven distribution of economic benefits (Elsinga et al. 2020). Additionally, there is a lack of research into designing holistic models that address these interrelated challenges, and hence we lack understanding of how homestays can be optimized for their maximum impact.

### Objectives

1. To Analyse current health, environmental sustainability, and community development practices in Uttarakhand homestays.
2. To propose a resilient framework for integrating health, environmental, and



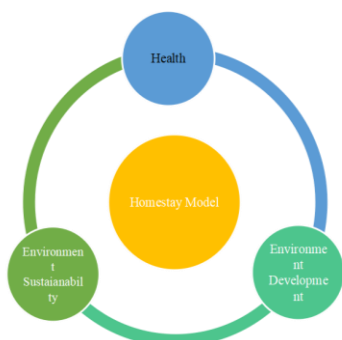
community development practices into homestay models.

### Review Literature

In recent years, homestays in Uttarakhand and other regions have begun to integrate health, environmental sustainability, and community development (Pakshir & Nair 2011). Several studies point to the utility of homestays in promoting sustainable tourism through fostering ecological responsibility, for example, through renewable energy, waste management, and water conservation (Kataria et al. 2023). Homestays are also researched for their role in improving local health standards by providing hygienic accommodations and healthcare access for both the host and guest (Bhan & Singh 2014). Nevertheless, there remain challenges, including differing practices among homestays, a lack of resources to introduce eco-friendly initiatives and limited training of hosts in health and hygiene (Joshi & Bahuguna 2023). On the other side, homestays play a crucial role in community development as a source of employment, cultural preservation, and local economic development (Ismail et al. 2016). A more integrated approach is needed to build resilient homestay models to address these intertwined dimensions.

### Conceptual Framework

This study conceptualizes a resilient homestay model in Uttarakhand by integrating three core dimensions: **health, environmental sustainability, and community development.** The framework derives from the sustainable tourism theory that incorporates these factors to produce a model that simultaneously serves the local community and the wider tourism ecosystem.



### Figure:1 Conceptual Framework

- 1. Health:** Homestays should have health standards for guests and host well-being. Some of the determinants are sanitation practices, hygiene protocols, healthcare access, and food safety. Keeping these standards in place lowers health risks and keeps homestays attractive to tourists.
- 2. Environmental Sustainability:** Homestays should have a minimum ecological footprint and an environmental dimension. Waste management, water conservation, and use of renewable energy (e.g., solar power) are fundamental practices that contribute to homestays positively to sustainable tourism and ecological preservation.
- 3. Community Development:** Homestays are a vehicle for promoting local economic growth and local cultural preservation. This dimension is the generation of employment opportunities, skill development programs, promotion of local crafts, and equitable benefits for host families and the community around them.

The study offers a conceptual framework in which, for a homestay model to be resilient, all three dimensions should be integrated effectively along the dimension of integration. It not only guarantees the long-term sustainability of the homestay sector but also benefits the overall welfare of the local community and the environment.

### Research Methodology

The study employs a descriptive cross-sectional design and samples 150 homestays from Uttarakhand, chosen through stratified random sampling to represent both the Kumaon and Garhwal regions. A mixed methods approach, consisting of a structured questionnaire and semi-structured interviews, is used to collect data. The questionnaire looks at health-related factors (sanitation, hygiene, access to healthcare), environmental practices (waste management, water conservation, energy use), and community development (employment opportunities, cultural



preservation, training programs). Statistical techniques like chi-square tests will be used to analyze the quantitative data, and thematic analysis will be used to analyze the qualitative data to identify patterns (Braun & Clarke, 2014).

### Data Analysis

The quantitative examination examines health outcomes and sustainability practices and the community impact of Uttarakhand homestays based on Table 1 data. The analysis demonstrates how waste management practices, along with energy conservation and local community benefits, are evolving while showing both successful aspects of sustainability endeavours and possibilities to boost overall effectiveness.

The results of the study highlight key insights across health, environmental sustainability, and community development dimensions among 150 homestays in Uttarakhand. In terms of health practices, 78% of homestays had proper sanitation facilities, while 65% ensured access to clean drinking water, with

Kumaon performing better (70%) than Garhwal (60%). However, routine health checkups (22%) and hygiene training programs (35%) showed low adoption rates across both regions. Regarding environmental sustainability, 48% of homestays utilized renewable energy, with higher adoption in Kumaon (55%) compared to Garhwal (40%). Waste management practices were implemented by 56%, while 62% employed water conservation measures, such as rainwater harvesting, more commonly in Kumaon (69%) than Garhwal (55%). For community development, homestays generated an average of 4–6 jobs, preserved local culture in 68% of cases, and organized skill-building workshops in 40%, with Kumaon leading in cultural preservation (73%) and training programs (47%). These findings reveal significant gaps in health and environmental practices and underscore the potential for homestays to drive community and economic development through targeted interventions.

**Table:1- Quantitative Analysis of Health, Environmental Sustainability, and Community Development Practices Among Homestays in Uttarakhand**

Dimension	Indicator	Frequency (n)	Percentage (%)	Kumaon (n=75)	Kumaon (%)	Garhwal (n=75)	Garhwal (%)	Key Observations
Health	Proper sanitation facilities	117	78%	62	83%	55	73%	Basic sanitation widely available; rural Garhwal areas lag behind.
	Access to clean drinking water	98	65%	53	70%	45	60%	Kumaon has better infrastructure for clean drinking water than Garhwal.
	Routine health checkups for staff	33	22%	15	20%	18	24%	Very low adoption overall due to resource constraints and lack of awareness.
	Hygiene training programs	52	35%	30	40%	22	29%	Adoption is sporadic; more common in urban areas with NGO support.
Environment	Adoption of renewable energy (e.g., solar)	72	48%	41	55%	31	40%	Financial barriers limit adoption, particularly in remote Garhwal areas.
	Waste management practices	84	56%	45	60%	39	52%	Segregation and composting practiced; plastic disposal remains a challenge.
	Water conservation measures	93	62%	52	69%	41	55%	Rainwater harvesting prevalent in Kumaon; awareness needed in Garhwal.



Community Development	Employment generated per homestay	Avg. 4–6 jobs	-	Avg. 5 jobs	-	Avg. 4 jobs	-	Homestays create employment for local families, with slight variation by region.
	Cultural preservation activities	102	68%	55	73%	47	63%	Prominent in both regions; includes festivals, local cuisine, and crafts.
	Skill-building workshops	60	40%	35	47%	25	33%	Supported mainly by NGOs; need for more structured and frequent training programs.

**Qualitative Analysis**

Key themes from interviews with homestay owners in Uttarakhand, focusing on Health, Environmental Sustainability, and Community Development is summarised in Table 2. Each theme is explained briefly, with supporting

quotes highlighting the challenges and practices the owners share. The insights complement the quantitative data, providing a deeper understanding of the local context and a clearer picture of the homestay's current situation.

**Table:2 - Qualitative Analysis of Health, Environmental Sustainability, and Community Development Practices Among Homestays in Uttarakhand**

Dimension	Theme	Description	Supporting Quotes
Health	Perceived Importance of Hygiene	Owners value hygiene for guest satisfaction but lack training and resources for consistent practices.	"We clean our premises daily, but we need workshops to learn modern techniques."
	Barriers to Healthcare Access	Remote areas face limited access to healthcare facilities, creating challenges for both hosts and guests.	"In case of an emergency, the nearest clinic is hours away. We need better local health infrastructure."
Environmental Sustainability	Financial Constraints in Adopting Eco-Friendly Practices	High costs and lack of subsidies limit the adoption of renewable energy and waste management solutions.	"I want to install solar panels, but the initial cost is beyond my budget."
	Awareness of Environmental Responsibility	Kumaon owners are more aware of environmental practices, adopting measures like rainwater harvesting and composting.	"Rainwater harvesting has reduced our water bills and helped during shortages."
Community Development	Empowerment Through Employment	Homestays provide jobs and economic support to local families, fostering community well-being.	"I employ locals for cleaning and cooking, which helps support their families."
	Preservation of Local Culture	Owners integrate cultural elements such as cuisine, crafts, and folk music to enhance guest experiences and preserve heritage.	"Guests love our local food and folk music; it helps us keep our traditions alive."

**Observations and Discussion**

The study reveals key insights into health, environmental sustainability, and community development practices in 150 homestays across Uttarakhand. Of homestays, 78% maintained proper sanitation, and 65% offered

access to clean drinking water. Routine health checkups, however, were rare (22%) and hygiene training programs were adopted by only 35%. Regarding environmental sustainability, 48% of homestays utilized



renewable energy, and 56% had waste management practices. More water conservation (62%) was observed in Kumaon than in Garhwal. Homestays created an average of 4–6 jobs in community development, 68% promoting cultural preservation and 40% organizing skill-building workshops. In all dimensions, Kumaon performed better than Garhwal.

This analysis indicates a great disparity in health and environmental consciousness with higher levels of uptake in Kumaon than in Garhwal. Failure to perform routine health check-ups and its low adoption of hygiene training implies that there is a need to apply a policy intervention. Nevertheless, the financial constraints to practicing sustainability mean that incentives, or outright financing, would encourage more uptake. Moreover, the social impact of homestays for community advancement and especially the creation of jobs and promotion of cultural heritage of the local population is still valuable although it requires additional resources to develop skill-building programs more effectively.

### **Conclusion and Future Perspective**

The present study underscores the significant potential of homestays in Uttarakhand as a viable instrument for promoting sustainable tourism, strengthening community-based development, and enhancing health and environmental outcomes. By integrating improved health and hygiene practices, incentivizing eco-friendly operations, and expanding capacity-building and skill development initiatives among local stakeholders, homestays can evolve into a more resilient and inclusive model of sustainable tourism. Such an approach not only enhances visitor satisfaction but also contributes to the long-term socio-economic well-being of host communities.

From a future perspective, further research is required to examine the long-term sustainability of health, environmental, and livelihood-related impacts associated with homestay operations. Studies employing larger

sample sizes, longitudinal designs, and comparative regional analyses would provide deeper insights into the practicality and scalability of the proposed resilient homestay framework. Additionally, future investigations may explore policy support mechanisms, technological interventions, and community-led governance models to strengthen the adaptive capacity of homestays in the face of changing environmental and public health challenges.

### **Limitations of the Study**

This study is subject to several methodological limitations that should be considered when interpreting its findings. The analysis is based on data collected from 150 homestays in the Kumaon and Garhwal regions of Uttarakhand. While informative, this sample may not adequately capture the full diversity of homestay operations across the state. The cross-sectional design, with data gathered at a single point in time, limits the ability to assess seasonal variations in tourism or to examine long-term trends in health, environmental practices, and community development. Practices related to sanitation, waste management, and employment may vary substantially between peak and off-peak seasons, which were not examined. Much of the data rely on self-reported responses from homestay owners, introducing the possibility of response bias. Although supported by interviews, the absence of direct observational methods further constrains validity. Additionally, the focus on homestays excludes comparisons with hotels or resorts and provides limited insight into policy and institutional support mechanisms.

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