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Tourism Growth versus Carrying Capacity in Indian Himalayan Destinations: A Secondary Data Analysis for Sustainable Tourism Management

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Abstract

The Indian Himalayan Region has witnessed substantial growth in tourism over the past decade, driven by improved transportation, government tourism initiatives, increasing domestic travel, and the expansion of religious, adventure, and nature-based tourism. This growth has significantly contributed to regional economies by generating employment opportunities, improving local livelihoods, and stimulating infrastructure development. However, the rapid growth in tourist arrivals has also intensified pressure on the fragile Himalayan ecosystem, resulting in environmental degradation, traffic congestion, solid waste accumulation, water scarcity, and stress on public infrastructure. These challenges have raised important concerns regarding the carrying capacity of major Himalayan destinations and the long-term sustainability of tourism development.

The present study examines the relationship between tourism growth and carrying capacity in the Indian Himalayan Region using a secondary data approach. The study is based on data collected from authentic sources, including the Ministry of Tourism, Government of India, India Tourism Statistics, UN Tourism, the World Travel & Tourism Council, NITI Aayog, state tourism departments, and peer-reviewed academic literature. Tourism growth is analysed alongside five dimensions of carrying capacity, namely environmental, physical, social, infrastructure, and ecological carrying capacity, to understand the implications of increasing visitor numbers on destination sustainability.

The study finds that although tourism has recovered rapidly in recent years, destination management and infrastructure expansion have not progressed at the same pace as tourist arrivals. Consequently, several Himalayan destinations experience seasonal overcrowding, increasing pressure on natural resources, and growing sustainability concerns. The findings highlight the need

to integrate carrying capacity assessment into tourism planning and destination management to ensure balanced economic development while safeguarding ecological integrity. The study contributes to the existing literature by providing an evidence-based assessment of tourism growth and carrying capacity and offers policy recommendations for promoting sustainable tourism management in the Indian Himalayan Region.

Keywords: *Tourism Growth, Carrying Capacity, Sustainable Tourism, Indian Himalayan Region, Mountain Tourism, Destination Management, Secondary Data Analysis.*

1. Introduction

Tourism has emerged as one of the fastest-growing sectors of the global economy and plays a vital role in promoting economic development, employment generation, regional integration, and cultural exchange. According to the United Nations Tourism Organization (UN Tourism), the tourism sector has recovered steadily following the COVID-19 pandemic, with domestic tourism acting as the primary driver of this recovery in many countries. In India, tourism has become an important component of national and regional development policies because of its substantial contribution to income generation, infrastructure development, and livelihood creation, particularly in ecologically sensitive mountain regions.

The Indian Himalayan Region (IHR) is one of the country's most valuable tourism assets owing to its exceptional natural landscapes, biodiversity, cultural heritage, religious centres, and adventure tourism opportunities. Stretching across several northern and north-eastern states and Union Territories, the region attracts millions of domestic and international tourists every year. Destinations such as Shimla, Manali, Mussoorie, Nainital, Leh, Gangtok, Gulmarg, Kedarnath, and Badrinath have become major centres of leisure, pilgrimage, and adventure tourism. Government initiatives such as *Swadesh Darshan*, *PRASHAD*, *Dekho Apna Desh*, improved road connectivity, expansion of regional air services, and digital tourism promotion have further accelerated tourism growth across these destinations.

Although tourism has become an important source of economic prosperity, its rapid expansion has also created significant sustainability challenges. The Himalayan ecosystem is characterized by fragile geology, steep terrain, rich biodiversity, and limited natural resources, making it highly vulnerable to unplanned tourism development. Increasing tourist arrivals often exceed the capacity of local infrastructure and natural resources, resulting in traffic congestion, water shortages, improper solid waste management, pollution, habitat degradation, and pressure on biodiversity. Seasonal concentration of visitors during summer vacations and religious pilgrimage periods further intensifies these challenges and affects both residents and tourists.

These concerns have brought the concept of carrying capacity to the forefront of sustainable tourism planning. Carrying capacity refers to the maximum level of tourism activity that a destination can accommodate without causing unacceptable environmental degradation, infrastructure failure, social disruption, or deterioration in visitor satisfaction. Initially developed from ecological studies, the concept has gradually evolved into a multidimensional framework encompassing environmental, physical, social, infrastructure, and ecological dimensions. Contemporary tourism planning increasingly recognizes that tourism success should be measured not only by the number of

visitors but also by the destination's ability to sustain tourism without compromising environmental quality and community well-being.

Existing studies have examined different aspects of tourism development in Himalayan destinations, including visitor satisfaction, environmental conservation, destination competitiveness, and sustainable tourism practices. However, most of these studies focus on individual destinations or specific tourism issues. Comprehensive studies that integrate tourism growth trends with multidimensional carrying capacity assessment using recent secondary data remain relatively limited. Moreover, the post-pandemic tourism recovery has altered travel patterns and increased visitor pressure on many mountain destinations, creating a need for updated evidence that reflects current tourism realities.

Against this background, the present study investigates the relationship between tourism growth and carrying capacity in the Indian Himalayan Region through a secondary data analysis. The study synthesizes information from official government publications, international tourism reports, and peer-reviewed academic literature to evaluate how increasing tourism demand has influenced environmental sustainability, infrastructure adequacy, and destination resilience. By examining tourism growth alongside multiple dimensions of carrying capacity, the study seeks to contribute to the growing discourse on sustainable tourism management and provide practical policy recommendations for balancing economic development with environmental conservation in Himalayan destinations.

2. Literature Review

Sustainable tourism has gained considerable attention due to the increasing environmental, social, and infrastructural challenges associated with rapid tourism growth. Butler (1980) introduced the Tourism Area Life Cycle (TALC) model, explaining that tourism destinations pass through successive stages of development and may ultimately stagnate or decline when tourism expansion exceeds the destination's carrying capacity. Complementing this perspective, O'Reilly (1986) defined tourism carrying capacity as the maximum level of tourism activity that can be accommodated without causing unacceptable environmental, social, or economic impacts, thereby establishing it as a fundamental principle of sustainable tourism planning.

Recognizing the multidimensional nature of carrying capacity, Coccossis and Mexa (2004) argued that sustainable destination management should integrate environmental, physical, social, and managerial dimensions rather than relying solely on visitor numbers. Similarly, Saarinen (2006) emphasized that sustainable tourism is a continuous development process requiring a balance between economic growth, environmental conservation, and

community well-being. Reinforcing these arguments, Butler (2020) highlighted that carrying capacity remains a relevant and practical framework for addressing overtourism and guiding evidence-based destination management.

Contemporary research has further refined the application of carrying capacity in tourism planning. Pásková et al. (2021) reconceptualized tourism carrying capacity as a dynamic management tool, arguing that effective destination governance should continuously assess spatial and temporal changes in visitor pressure to maintain destination sustainability. In a related study, Khan et al. (2021) demonstrated that sustainable tourism policies and effective destination management positively influence sustainable tourism development, emphasizing the importance of coordinated governance and stakeholder participation.

Although previous studies have substantially advanced the understanding of sustainable tourism and carrying capacity, most have examined these concepts either theoretically or within specific destination contexts. Empirical evidence integrating tourism growth with multiple dimensions of carrying capacity using recent secondary data remains limited, particularly for the Indian Himalayan Region. Therefore, the present study addresses this gap by evaluating tourism growth alongside carrying capacity indicators to support evidence-based sustainable tourism management.

3. Research Objectives

The present study aims to achieve the following objectives:

1. To examine the growth trends of tourism in major Indian Himalayan destinations using secondary data.
2. To assess the carrying capacity challenges associated with increasing tourist arrivals in selected Himalayan destinations.
3. To analyse the relationship between tourism growth and the environmental, physical, social, and infrastructural dimensions of carrying capacity.
4. To evaluate the implications of tourism growth for sustainable tourism management in the Indian Himalayan Region.
5. To propose policy recommendations for balancing tourism growth with carrying capacity for long-term sustainable destination development.

4. Research Methodology

4.1 Research Design

The study adopts a descriptive and analytical research design based entirely on secondary data. The descriptive approach is used to examine tourism growth trends and carrying capacity indicators, while the analytical approach facilitates the interpretation of relationships between tourism expansion and sustainable destination management. This design is appropriate for assessing tourism development patterns across major Indian Himalayan destinations and identifying the sustainability challenges associated with increasing tourist inflows.

4.2 Data Sources

The study is based exclusively on secondary data collected from authentic and publicly accessible sources. The principal sources include reports and statistical publications of the Ministry of Tourism, Government of India, the Ministry of Environment, Forest and Climate Change (MoEFCC), the Uttarakhand Tourism Development Board, Himachal Pradesh Tourism Department, Jammu and Kashmir Tourism Department, the World Tourism Organization (UN Tourism), the World Travel and Tourism Council (WTTC), and relevant peer-reviewed journal articles. These sources provide reliable information on tourist arrivals, tourism infrastructure, environmental conditions, and destination management practices.

4.3 Study Period

The analysis covers the period from 2014 to 2024, capturing both the tourism expansion phase and the post-pandemic (COVID-19) recovery.

4.4 Data Analysis Techniques

The collected data were analysed using descriptive analysis, comparative assessment, trend interpretation, tabular presentation, and graphical visualization. Comparative interpretation of tourism growth indicators and carrying capacity dimensions was undertaken to identify emerging sustainability concerns and develop evidence-based recommendations for sustainable tourism management.

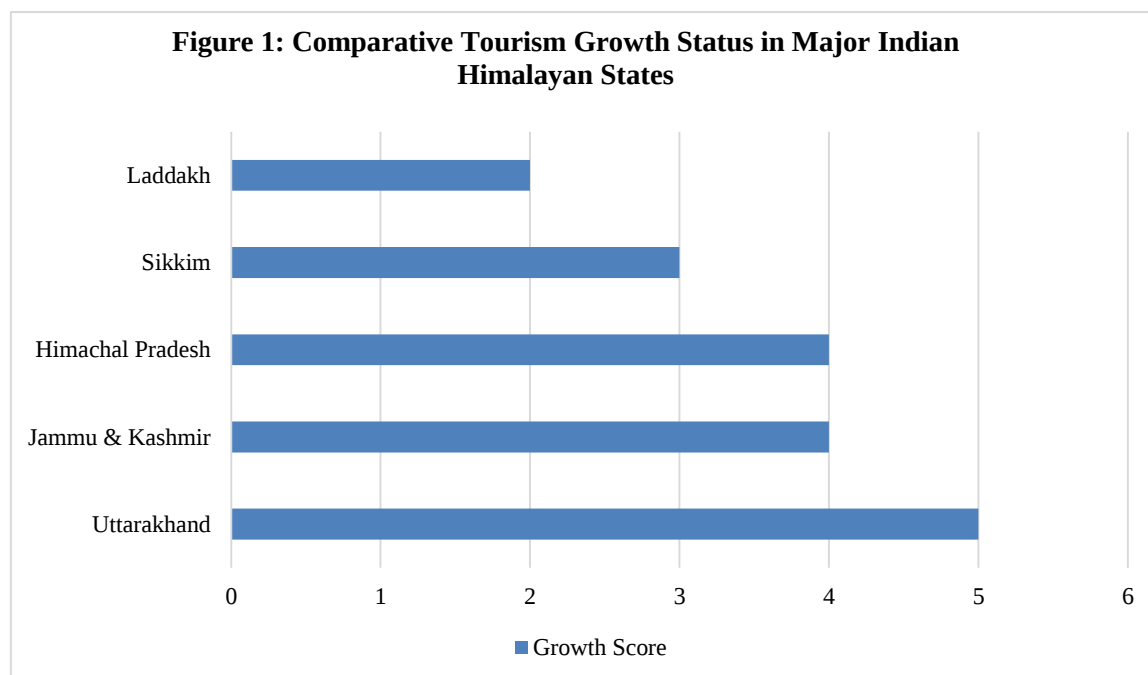
5. Tourism Growth Trends in Indian Himalayan Destinations

Table 1: Comparative Tourism Growth Status of Selected Indian Himalayan States/UTs Based on the Latest Official Tourism Statistics (2024)

Rank	State/UT	Tourism Growth Pattern	Growth Status
1	Uttarakhand	Highest among selected Himalayan destinations	High Growth
2	Jammu & Kashmir	Strong post-pandemic growth	High Growth
3	Himachal Pradesh	Consistent growth	Moderate-High
4	Sikkim	Steady growth	Moderate
5	Ladakh	Rapid recovery with comparatively lower tourist volume	Emerging Growth

Source: Author's compilation based on India Tourism Data Compendium 2025.

Note: The latest officially available state-wise tourism statistics published by the Ministry of Tourism, Government of India, are available up to 2024. Therefore, the present analysis is based on the latest available official data.



Source: Author's compilation based on *India Tourism Data Compendium 2024*.

The latest official tourism statistics indicate that tourism continues to expand across the Indian Himalayan Region (IHR), although the pace of growth varies across destinations. Uttarakhand remains the leading Himalayan tourism destination owing to its religious, nature-based, and adventure tourism attractions. Jammu & Kashmir has witnessed remarkable post-pandemic recovery supported by improved connectivity and increasing visitor confidence. Himachal Pradesh continues to attract substantial tourist inflows through its established hill stations and diversified tourism products. Sikkim has recorded steady growth through eco-tourism initiatives, whereas Ladakh has emerged as a rapidly growing destination despite comparatively lower tourist volumes. Overall, the observed tourism trends indicate sustained growth in tourism demand across the Indian Himalayan Region. While this expansion has generated significant economic opportunities, it has also intensified pressure on ecological resources and tourism infrastructure, thereby reinforcing the need for carrying capacity-

based tourism planning. These findings provide the empirical foundation for the carrying capacity analysis presented in the following section.

6. Carrying Capacity Analysis

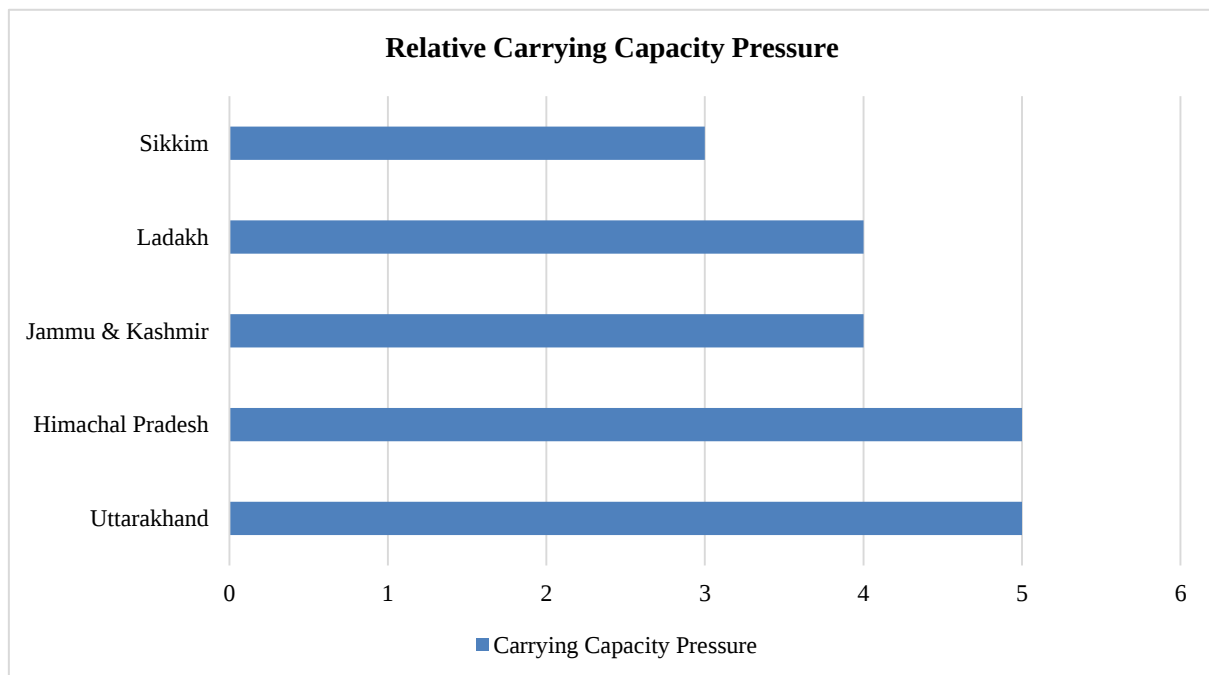
The rapid expansion of tourism across the Indian Himalayan Region (IHR) has generated significant economic opportunities while simultaneously increasing pressure on fragile mountain ecosystems and tourism infrastructure. Assessing the carrying capacity of tourism destinations is therefore essential for achieving sustainable tourism management. Carrying capacity refers to the level of tourism activity that a destination can accommodate without causing unacceptable environmental degradation, deterioration in visitor experience, or adverse socio-economic impacts on local communities. Based on evidence synthesized from government reports and peer-reviewed studies, Table 2 presents a comparative assessment of the carrying capacity status of selected Indian Himalayan destinations.

Table 2: Comparative Carrying Capacity Status of Selected Indian Himalayan Destinations

Rank	State/UT	Environmental Pressure	Infrastructure Capacity	Overall Carrying Capacity Status
1	Uttarakhand	High	Moderate	Near Critical
2	Himachal Pradesh	High	Moderate	Near Critical
3	Jammu & Kashmir	Moderate–High	Moderate	Moderate–High
4	Ladakh	High (Ecologically Fragile)	Low–Moderate	Environmentally Sensitive
5	Sikkim	Moderate	Moderate–High	Relatively Sustainable

Source: Author's compilation based on secondary literature and government reports.

Figure 2: Comparative Carrying Capacity Status of Selected Indian Himalayan Destinations



Source: Author's compilation based on secondary literature and government reports.

The comparative assessment indicates considerable variation in carrying capacity conditions across the selected Himalayan destinations. Uttarakhand and Himachal Pradesh exhibit the highest levels of carrying capacity pressure due to intensive pilgrimage tourism, hill-station tourism, and adventure tourism. During peak tourist seasons, these destinations frequently experience overcrowding, traffic congestion, increased solid waste generation, water shortages, and growing pressure on public infrastructure, suggesting that tourism activity is approaching the carrying limits of several popular destinations.

Jammu & Kashmir has experienced substantial tourism recovery in recent years, supported by improved connectivity and increasing visitor confidence. While tourism has strengthened regional economic development, the rapid growth in tourist arrivals has increased seasonal pressure on accommodation facilities, transportation networks, and urban services, particularly in Srinagar, Gulmarg, and Pahalgam.

Sikkim demonstrates comparatively better carrying capacity management through regulated eco-tourism, community participation, and conservation-oriented tourism policies. These measures have enabled the state to maintain a relatively balanced relationship between tourism growth and environmental sustainability despite increasing visitor arrivals.

Ladakh remains one of the most environmentally sensitive tourism destinations in India. Its fragile mountain ecosystem, limited freshwater resources, high-altitude environment, and relatively constrained infrastructure make it particularly vulnerable to tourism-related environmental stress. Consequently, even moderate increases in tourist arrivals may generate disproportionately high ecological impacts.

Overall, the findings suggest that although tourism has become an important driver of regional economic development in the Indian Himalayan Region, increasing visitor pressure poses significant challenges for environmental sustainability. Future tourism planning should therefore emphasize carrying capacity-based

destination management, scientific visitor regulation, sustainable infrastructure development, effective waste management, water resource conservation, and continuous environmental monitoring to ensure the long-term sustainability of Himalayan tourism.

7. Discussion

The findings of the present study indicate that tourism has become a significant driver of socio-economic development in the Indian Himalayan Region (IHR). Improved transport connectivity, government tourism initiatives, religious tourism, and increasing domestic travel have contributed to sustained tourism growth across major Himalayan destinations. However, the study demonstrates that the benefits of tourism expansion have been accompanied by increasing environmental and infrastructural pressures, particularly in destinations experiencing high seasonal tourist inflows.

The comparative assessment reveals that Uttarakhand and Himachal Pradesh face the greatest carrying capacity challenges due to pilgrimage tourism, hill-station tourism, and adventure tourism, which generate substantial pressure on transportation systems, water resources, waste management, and public infrastructure during peak seasons. Similarly, Jammu & Kashmir has experienced rapid post-pandemic tourism recovery, resulting in increased demand for accommodation, transport, and urban services. In contrast, Sikkim exhibits relatively better destination management through eco-tourism practices and conservation-oriented policies, while Ladakh remains environmentally vulnerable because of its fragile ecosystem and limited infrastructural capacity.

These findings are consistent with the studies of Butler (1980), Saarinen (2006), Butler (2020), and Pásková et al. (2021), which emphasize that tourism growth should remain within the ecological and infrastructural limits of destinations. The study reinforces the carrying capacity perspective by highlighting that tourism development should be guided not only by visitor growth but also by the ecological and infrastructural limits of destinations.

Sustainable tourism planning therefore requires a balanced approach that integrates environmental conservation, infrastructure development, visitor management, and community participation.

Overall, the study suggests that long-term tourism sustainability in the Indian Himalayan Region depends on adopting carrying capacity-based destination planning, strengthening environmental governance, improving waste and water management systems, and promoting responsible tourism practices. Such an integrated approach will help ensure that tourism continues to contribute to regional development while preserving the ecological integrity and resilience of Himalayan destinations.

8. Policy Implications

The findings suggest that sustainable tourism management in the Indian Himalayan Region should prioritize carrying capacity as a key criterion in tourism planning. Policymakers should undertake periodic carrying capacity assessments to regulate tourist inflows and prevent environmental degradation. Investments in sustainable infrastructure, including waste management, water supply, sanitation, and public transport, are essential to accommodate growing tourist demand. Environmentally sensitive destinations such as Ladakh and Sikkim require stricter conservation measures and eco-friendly tourism practices. The adoption of digital visitor management systems, advance booking mechanisms, and real-time monitoring can help reduce overcrowding during peak seasons. Furthermore, strengthening community participation and coordination among tourism authorities, environmental agencies, and local stakeholders will support balanced tourism growth while ensuring the long-term sustainability of Himalayan destinations.

9. Conclusion

The study concludes that tourism has become an important driver of economic development in the Indian Himalayan Region, creating employment opportunities and enhancing local livelihoods. However, the rapid increase in tourist arrivals has also intensified pressure on fragile ecosystems and tourism infrastructure, highlighting the importance of carrying capacity-based destination management. The comparative analysis demonstrates that while destinations such as Uttarakhand and Himachal Pradesh face higher carrying capacity pressures, Sikkim presents relatively better sustainable tourism practices. The findings emphasize that tourism growth should be balanced with environmental conservation, infrastructure development, and community participation. Adopting sustainable tourism policies based on carrying capacity assessment will help ensure the long-term resilience, competitiveness, and sustainability of tourism in the Indian Himalayan Region. Future research may incorporate destination-specific primary data and quantitative carrying capacity indicators to strengthen evidence-based tourism planning in Himalayan destinations.

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