



Assessing the Impact of Sustainable Waste Management Practices on Rural Tourist Destinations- A Study of Himachal Pradesh

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Abstract: Himachal Pradesh is abundant with various natural, ecological, cultural, and rural treasures. During the last decade, policymakers and researchers have taken the initiative to create tourists' sensitivity towards the cultural & natural properties of its tourist hotspots by maintaining their integrity. This study investigates the impact of sustainable waste management practices on the rural tourist destinations in Himachal Pradesh. The study focuses on identifying links between increased tourist activities and solid waste generation by outlining the issues that local communities and authorities confront in managing this waste sustainably. The study evaluates the effectiveness of current waste management strategies, such as garbage segregation, recycling, zero waste initiatives, installation of waste management aids, and community-driven initiatives, by reviewing current literature, sustainable waste management practices, government policies, and report documents. The findings of the study accentuate the impact of sustainable waste management practices & techniques in maintaining the environmental integrity of rural tourist destinations of Himachal Pradesh, it also proposes benefits and challenges of sustainable waste management initiatives, as well as actionable ideas for improving the sustainability of rural tourism destinations.

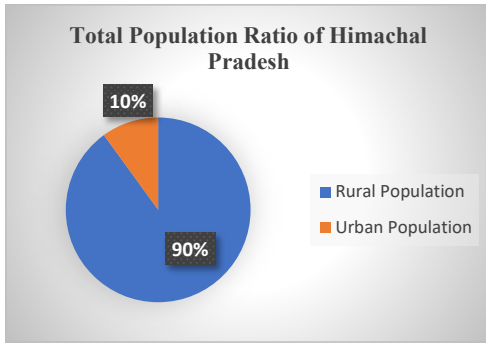
Key Words: Sustainable Waste Management, Solid & Liquid Waste, Rural Tourism, Sustainable Practices, Rural Regions, Himachal Pradesh

1. Introduction

Ensclosed in the Himalayas, Himachal Pradesh is called the land of Gods [1]. The state is enriched with incomparable natural beauty, distinctive biological diversity, and exceptional cultural legacy, making it an ideal tourism destination. Rural tourism has emerged as an integral source of economic growth and long-term development of any destination by focusing on authentic rural experiences in recent years [3] [15]. As per the 2011 census, most of the rural population and its dependency on agriculture make Himachal Pradesh an ideal choice for niche visitors. With the growing visitor influx, the increased solid waste output poses substantial challenges to maintaining the sustainability of these vulnerable ecosystems. Consequently, Himachal Pradesh's environmental integrity is at risk because of the unplanned and long-term viability of the tourism industry [2]. So, it has become the need of the hour that governments, researchers, and local communities are increasingly focused on sustainable waste management strategies.

1.1. Rural Tourism in Himachal Pradesh: An Overview

Himachal Pradesh allows visitors to immerse themselves in its traditional lifestyle, culture, and natural beauty of rural & isolated communities [15]. The state has a 90/10 % ratio of rural and urban population, which makes it a suitable choice for tourists who wish to explore rural, remote tourist destinations.



Source: Author self-Created based on Census of India, 2011

Table 1. Population of Himachal Pradesh

Population	Number in lakh
Total Population	68 Lakh
Rural Population	61.76 Lakh (90%)
Urban Population	6.88 Lakh (10%)

Rural tourism not only supports the local communities financially but also encourages the preservation of cultural assets of the state. The concept of rural tourism has grown over the last two decades as an alternative economic resource in areas where agriculture is no longer feasible due to a variety of issues[5], this tendency is also consistent with global patterns of rural tourism which acts as a supplementary revenue source, driving rural development by drawing visitors interested in experiencing the tranquillity and culture of rural living [4]. So, Himachal government has launched projects, like "Har Gaon Ki Kahani" and the "Home Stay Scheme," to create and support rural tourism activities in lesser-known and isolated places of the state [12] to transform historically significant rural destinations /villages into emerging place with basic tourist services and activities by highlighting the rich cultural traditions and legacy of the state [14].

Among these areas, Chitkul village in Kinnaur district, with its traditional wooden dwellings, distinct culture, and natural beauty, has been famed among the tourists for its authentic rural experiences and stunning views in winter. In recent years, the Langza village of Lahaul Spiti emerged as one of the rural eco attractions because of its rare wildlife, tranquil environment, fossils, connection to nature, and Buddhist beliefs. Tourists' footfall is also increasing to Malana village "Little Greece of Himachal Pradesh" because of its ancient temples of Kathkuni style of architectures and remoteness, Kasol village of Kullu valley is also becoming the centre of attraction because of its location near to Manikaran in Parvati valley makes it accessible for natural, adventure and cultural enthusiasts.

Table 2. Key Initiatives for Rural Development in Himachal Pradesh

Key Initiatives for Rural Development	Details
Tourism Development Scheme	Swadesh Darshan 2.0 (SD2.0)
Total Projects Under Swadesh Darshan	76 projects worth ₹5287.90 crore across India
Project Sanctioned for Himachal Pradesh	1 project worth ₹68.34 crore
Key Identified Destinations in Himachal Pradesh	Pong Dam (Eco-tourism & Water Activities)

	Kaza (Spiti Valley) (Cultural & Heritage Tourism)
	Rakchham & Chhitkul (Vibrant Villages Program)
Challenge-Based Destination Development (CBDD) Focus	Developing rural and remote villages as tourism destinations
Tribal Homestay Development Initiative	Part of Pradhan Mantri Janjatiya Unnat Gram Abhiyan
Financial Support for Homestays	₹5 lakh for new construction
	₹3 lakh for renovation
	₹5 lakh for village community infrastructure

Source: Rajya Sabha Unstarred Question No.2059

For enhancing tourism infrastructure across the country, the Indian government has launched Swadesh Darshan scheme 2.0 with the sanction of 76 projects of a total ₹ 5287.90 crore budget. Himachal Pradesh has been kept as one of the integral regions for infrastructure development and allocated one project of ₹ 68.34 crore for developing the Himalayan circuit, including Kiarighat, Shimla, Hatkoti, Manali, Kangra, Dharamshala, Bir, Palampur, and Chamba. A challenge-based destination development approach is adapted to promote tourism in rural and remote cultural and eco destinations [10]. Additionally, the state has taken the initiative to support local communities through Tribal Homestays schemes under Pradhan Mantri Janjatiya Unnat Gram Abhiyan with a fund of ₹ 5 lakh, ₹ 3 lakh, and ₹5 lakh for new homestay construction, renovation, and building community infrastructure to encourage sustainable growth of tribal and rural regions.

1.2. Strategic tourism initiatives in rural areas- Himachal Pradesh

- The Sky Walk Bridge in Hassan Valley near Kufri is one of the most awaited projects because of its innovative attraction and the exhilarating experience of strolling among the clouds.
- Water Sports Activities are an effort to broaden the state's adventure tourism portfolio. The state government has approved water sports activities on the tranquil waters of Gobind Sagar Lake in Bilaspur and Androli village in Una. These areas are planned to provide a variety of water-based activities, catering to adventure seekers and increasing the attraction.
- The government extended adventure tourism possibilities by introducing hot air ballooning activities in the Pong Dam area by providing an unmatched experience of Himachal Pradesh's natural beauty.
- To accommodate the expected inflow of tourists, the state administration is also working to improve air connectivity. The extension of Kangra Airport is already underway, and heliports are being built in each district headquarters. Upcoming air services from the Sanjauli heliport are planned to create isolated tourist sites accessible.
- Picturesque rural regions of Lahaul-Spiti, Kinnaur, and Kullu are establishing as emerging rural attraction with strategic infrastructure building and government support.
- The state government has also decided to allow shops to be open 24 hours a day during high tourist seasons. This program intends to improve the entire tourist experience by giving 24/7 access to services and amenities. In a historic move, Himachal Pradesh's Kangra district has been designated as the 'Tourism Capital'. This category is supported by significant infrastructure.

- Kullu Dussehra and Kinnaur's Losar have become a cultural motivation for both domestic and foreign visitors with insight into the region's unique cultural heritage. Considering the increasing tourist footfall, the state government has also sponsored projects such as the "Himachal Pradesh Homestay Scheme 2008" to cater to this increased demand.
- The Atal Tunnel enhanced access to isolated places and boosted tourism in Lahaul-Spiti. Additionally, continuing ropeway developments are intended to improve connections and attract more people. One of the most significant benefits of rural tourism in Himachal Pradesh is the possibility for long-term development that is sustainable and community development [3]. It takes relatively little investment and poses less danger than other types of tourism.

1.3. Himachal Pradesh & Solid Waste management

Sustainable travel report 2021 by booking.com highlights a strong global appeal of responsible and conscious travel behaviour, this report reveals that 84 % of traveller agreed to reduce general waste created during travel where 83 % identified the minimal or responsible energy consumption along with 81 % notified their preference to stay in a sustainable accommodation. This report narrates the growing shift of visitors towards environment and willingness to contribute in sustainable management of rural and other tourism regions.

Table 3. Sustainable Travel Report,2021

Sustainable Commitment	Percentage of Travellers (%)
Want to reduce general waste	84%
Want to reduce energy consumption (e.g., turning off AC and lights)	83%
Prefer to stay in sustainable accommodation	81%

Source: Booking.com

The Annual Report 2021-22 of Central Pollution Control Board Delhi on Implementation of Solid Waste Management Rules, 2016 specifies that Himachal Pradesh collects approx. 95 % of total solid waste created per-day among which they are treating approximately 70 % and around 25 % as Landfill Remain. Pit composting and Organic Waste Convertor (OWC) have been observed as the majorly used strategy. Currently State has 48 active Dumpsite for collecting and processing the solid waste. Among all the four regions- Shimla, Manali, Dharmshala and Dalhousie; Shimla ranks on top with 100% waste segregation, 95 % mechanical waste lifting and 80 % of waste storing. The state is successfully implementing solid waste management practices with the composting facilities and innovative solid waste processing.

2. Literature Review

India's tourism industry is facing concerning challenges to implement sustainable waste management strategies [8]. An active sustainable leader, Tejas Joseph predicted that waste management industry is growing with 6.9% per year. Although specific data is lacking but it is estimated that tourism industry as a whole contribute approximately 30% of the total waste generated annually in India. Solid waste management has been observed as a major issue in India, where only 75% of total solid garbage is collected by municipal organizations and ended as only 25% of it as systematical recycling, landfilling, or incineration which cause the major uncollected and unprocessed garbage as landfill only [7]. This uncollected debris frequently ends up cluttering public and private spaces before being washed into sewers, lakes, and rivers, contributing to urban flooding. According to world bank, India will rank as the third largest generator of solid municipal waste with an expectation of generating 3.40 billion tonnes of

solid waste by 2050 [7]. Indian Planning Commission's report, 2014 has already confirmed this prediction and suggested for the proper solution of this waste and convert it into energy.

Himachal Pradesh is also standing on the edge as major tourist regions of the state like Manali, Shimla, Dharmshala and Dalhousie generates approximately 3000 tonnes of garbage every year. This increases up to 150 tonnes daily during the peak season as per Times of India's report in 2020 these statistics seemed decreasing during pandemic only. The concept of sustainable waste management has gained traction in recent years [11][13], particularly in rural tourism that the proper solid waste management is required for preserving the traditional, natural and cultural integrity of remote as well popular tourist sites [8]. In Himachal Pradesh, numerous projects have been implemented to alleviate the difficulties caused by waste generation in rural communities [15]. Previous researches were focused on the value of community involvement in waste management strategies, but there is an urge of waste segregation, waste recycling, and zero-waste activities as significant measures for lowering negative environmental impacts [2]. Further to these discussions, the state High Court suggested the state government to mandate tourists for carrying garbage bags as practiced for tourists in Goa and Sikkim. The court also proposed solid waste management charges to be applied on tourists and trekkers with proper training to local bodies on waste management and environmental conservation.

3. Research Objective & Methodology

This study is based on qualitative research approach in examining the rural tourism possibilities in Himachal Pradesh and evaluating the waste management strategies applied in this region for sustainable growth of the state. For the comprehensive and contextual understanding of waste management practices, the research is focused on secondary data sources including government policy documents, reports, press release and academic literature. The interpretive discussion is conducted for assessing state's waste management policies and its significance in mitigating environmental impacts occurred because of rural tourism practices in the state. The discussion and findings are structured and supplemented with tabular and graphical presentations to draw an evidential conclusion

The objective of this study is:

- The goal of this research is to investigate the influence of rural tourism on waste creation in Himachal Pradesh as well as to assess the efficacy of sustainable waste management strategies.
- The study is aimed to identify issues and recommend solutions for preserving environmental and cultural integrity in rural tourist locations.

4. Discussion

After reviewing various reports, government policies, literature on rural tourism and sustainable waste management practices of Himachal Pradesh, it has been identified that tourism has been a significant source of solid waste generation in the state. To identify the impact of tourist arrival on waste generation, Tourist statistics have been evaluated for last five year with a focus on post covid period.

Table 4. Tourist Arrivals in Himachal Pradesh (2019-2024)

Year	Domestic Tourists	Foreign Tourists	Total Tourists	% Change from Previous Year
2019	1,68,29,231	3,82,876	1,72,12,107	4.63%
2020	31,70,714	42,665	32,13,379	-81.33%
2021	56,32,270	48,320	56,80,590	75.43%
2022	1,50,70,944	29,333	1,51,00,277	167.87%

2023	1,59,42,118	62,806	1,60,04,924	5.99%
2024	1,80,41,929	82,765	1,81,24,694	13.30%

Source: <https://himachaltourism.gov.in/wp-content/uploads/2025/02/Tourist-Statistics.pdf>

State’s Tourist Arrival data of domestic and international tourists shows a significant hike event after the pandemic in last five years, though during pandemic, global tourism has seen a drastically dropdown but Himachal rebounded its tourism by 2021 & 2022 which is projected to continue in 2024 as well indicate an ongoing growth. For understanding the relationship between tourist arrivals and waste management, a rigorous analysis has been done of Central Pollution Control Board, Delhi reports of recent years.

Table 5. Waste Management in Himachal Pradesh (2019-2022)

Year	Waste Generated (TPD)	Waste Collected (TPD)	Waste Processed/ Treated (TPD)	Waste Landfilled (TPD)	Gap (TPD)
2021-22	383	349	269	80	34
2020-21	393	354	230	124	39
2019-20	346	332	221	111	14

Source: Annual Report on Solid Waste Management (2019-20,2020-21 & 2021-22), CPCB, Delhi
 TPD*(Tonnes Per day)

This table indicates an increase in waste generation in the state 346 tonnes per day in the year 2019-20 to 382 tonnes per day in 2021-22 calendar year. Where the collection of was shows a consistent ratio of 90% during these years. The state shows remarkable growth in waste processing during these years. The landfilling dependency of up to 30 to 40 % non-treated waste is the challenge. Even though a fall has been observed of waste landfill from 124 TPD to 80 TPD in recent years is slightly assertive of the initiative and efforts which needs further attention.

This study's findings show a substantial association between increased tourist activity and solid waste creation in Himachal Pradesh's rural areas. According to various reports and case studies, only a few rural tourist areas have successfully implemented sustainable waste management procedures, and most of the destinations are facing issues due to poor infrastructure, a lack of awareness, and limited community involvement [13]. In areas where waste segregation and recycling methods have been properly implemented, the volume of waste delivered to landfills has decreased significantly. These techniques have also helped to conserve resources and promote the circular economy. Zero-waste measures, such as using biodegradable materials and promoting reusable products, have shown promise in minimizing tourism's environmental impact [2]. These programs, frequently led by local environmental organizations and non-governmental organizations (NGOs), have not only improved waste management techniques but also increased community members' sense of ownership and responsibility.

4.1 Himachal Pradesh Tourism policy 2019 for Solid & Sustainable Waste Management

The Himachal Pradesh Tourism Policy's approach to solid waste management methods is well organised and aims to promote sustainable waste management practices in remote tourist locations. This policy also simplifies and streamlines permit and clearance processes for tourism developments, attracting investment in sustainable infrastructure such as waste management systems.

Table 6. Himachal Pradesh Tourism policy 2019 for Solid & Sustainable Waste Management

Objective	<ul style="list-style-type: none"> • To protect the state's tourist hotspots through sustainable measures. • To Create an enabling environment for investments in sustainable practices in tourism. 	
Strategy 1:	Improving and developing tourism management principles for sustainable tourism.	
Short Term	Medium Term	
The emphasis on developing thematic tourist codes of conduct and guaranteeing full registration of service providers demonstrates a robust regulatory framework. These strategies can assist control tourist activities and ensure that they are consistent with sustainability goals	The development of databases for live statistics and periodic reviews of guidelines are critical for real-time monitoring and continual improvement, ensuring that tourist practices are sustainable	
Strategy 2	focusses on developing tourism destinations with carrying capacity	
Short Term	Medium Term	Long Term
The technique for assessing carrying capacity and limiting the number of tourists in pristine places for protecting vulnerable ecosystems	The creation of satellite nodes to relieve congestion in popular regions	Implementation of destination control systems for reducing environmental effect
Strategy 3	Encourage green practices in all tourist sites- This strategy specifically covers solid waste management, energy conservation, and water conservation.	
Short Term	Medium Term	Long Term
<ul style="list-style-type: none"> • Enforcing the Solid Waste Management Rules (2016) and Plastic Waste Management Rules (2016) • Collaboration with the Swachh Bharat Mission to preserve cleanliness. • Promotion of zero-waste destinations and the ban on rubbish burning as key steps. • Encouraging NGOs to run awareness campaigns and cleanliness drives increases community participation for long-term sustainability 	Introducing a green fee for tourists visiting Shimla, Manali, and Dharamshala to reduce waste generation and fund for waste management facilities.	<ul style="list-style-type: none"> • Making environmental audits for tourism registration & renewals as a proactive strategy. • It will help to guarantee that service providers will follow sustainable practices, with an emphasis on waste reduction and segregation

Author self-Created based on Himachal Pradesh Tourism Policy-2019

The policy also includes exploring new waste management solutions including waste-to-energy technologies and community-led composting projects along with developing tourism management mechanisms in pristine regions like Chandra Tal and Pin Valley. The policy advises a proper mechanism such as online permission systems and restriction on automobile use to decrease environmental degradation by managing tourist footfall. Diversification of tourist activities to new sites by adopting

traffic limits during peak seasons is effective in alleviating overcrowding and pollution in major tourist areas. This policy also strengthens the homestay concept with a proper registration and quality ratings requisitions [12].

4.2 Solid Waste Management Initiatives

Along with government initiatives, schemes, and policies, several individual and NGO initiatives are identical in managing tourist-generated waste in remote and rural destinations of the state [15]. Among all such efforts, Healing Himalaya is one of the remarkable contributors who has been working since 2016 in the state and has collected over 800 tonnes of waste from Himachal Pradesh's mountains—equivalent to the weight of seven blue whales. This includes about 1,400 kg of plastic waste from treks and 2,200 kg from biodiversity parks around Shimla and Manali. Healing Himalayas with the help of individual volunteers operates mainly in Parvati Valley, Shimla, and Manali and has conducted clean-up drives in several villages across the state, including Chitkul, Rakcham, Bathseri, Kinnaur, Kangra Valley, and Hampta [6].

4.2.1 Solid and Liquid Waste Management (SLWM) efforts in Himachal Pradesh

The government is now firmly applying the various initiatives of managing waste like Solid Waste management rule, 2016 and Swachh Bharat Mission- Gramin (SBM-G) by managing right waste management practices, training & workshops and financial supports directly to Gram panchayats proportionate to the household Size for creating basic and sustainable waste management infrastructure.

Table 7. Solid and Liquid Waste Management (SLWM)- Initiatives

Solid and Liquid Waste Management (SLWM)- Initiatives	Details
Challenges in Waste Management	High waste generation due to tourism influx
	Seasonal variation in waste quantity
	Need for systematic and cost-effective waste management
Government Initiatives	Implementation of Solid Waste Management Rules, 2016
	Swachh Bharat Mission – Gramin (SBM-G) for rural waste management
	Financial support for Gram Panchayats (GPs) to implement SLWM projects
Financial Support to Gram Panchayats	₹7 lakh for GPs with up to 150 households
	₹12 lakh for GPs with up to 300 households
	₹15 lakh for GPs with up to 500 households
	₹20 lakh for GPs with more than 500 households
Total SLWM Investment	₹103.68 crore utilized in 768 GPs
	₹427.42 crore allocated for AIP (2019-20)
SLWM Infrastructure Development	Soak Pits, Magic Pits, Leach Pits, and Drains developed
	Waste segregation at source encouraged
	Institutional framework over ad-hoc waste management approaches
Cluster-Based Waste Management Approach	12 SLWM clusters covering 109 GPs identified
	Block-level SLWM plans prepared
	500 GPs targeted as Zero Waste GPs by October 2019
Workshops & Training	2-day SLWM workshop at HIPA, Shimla

	Exposure visits for PRI representatives & officials to high performing GPs
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Source: Department of Information & Public Relations, Himachal Pradesh

4.2.2 Sustainable Waste Management Case Studies

To address waste management difficulties in rural tourism sites, numerous sustainable approaches have been implemented [13]. In many villages, waste management is driven by the local community with the help of private stakeholders for waste segregation and disposal [6]. In the Spiti Valley, local communities have launched zero-waste programs, encouraging tourists to reduce waste generation and dispose of rubbish. Chitkul and Langza villages have also implemented waste segregation procedures, which divide garbage into biodegradable and non-biodegradable categories and process accordingly [14]. There is many awareness programs held in rural tourist sites to educate both tourists and residents about the necessity of sustainable waste management. The Himachal Pradesh government has supported waste management programs such as "Har Gaon Ki Kahani" with policies and financing in rural tourism settlements. Villages like Langza and Komik in Spiti Valley have become an example for others by practicing a zero-waste policy and encouraging tourists to bring their rubbish back with them. Composting toilets and waste segregation bins have been built in strategic areas to help manage tourism trash properly. Kasol village is also setting examples with the support of local officials and non-governmental organizations (NGOs) managing waste caused by the influx of tourists. Now whole of Parvati Valley is attracting tourists to its clean-up campaigns to protecting the environment.

The Energy and Resources Institute's report of 2015 on Urban waste management in Himachal Pradesh, advocated to implement the waste management practise of Brazil and Europe.

- Brazil has developed and implemented the solid waste management cycle of reduce, reuse, recycle and regenerate in their national waste management policy. The industries have been motivated to focus on recycling approaches and promoting green practices for environ sustainability. Unregulated Landfills are mandatorily closed by tapping strict penalties in case of non-compliance of environmental conservation laws of the country. Himachal Pradesh can observe these practices as case study to regulate better solid waste management practices in the state.
- Europe has always been the initiator for implementing and promoting sustainable waste management techniques. They have been leader in creating the energy sources from bio wastes in landfills, replacing the usual fertilizer by waste composts and proper recycling process with less greenhouse gas emission. Austria, Netherlands and United Kingdom are running awareness campaigns such as PAYT (Pay as You Throw) and strict compliance of bio gradable waste management systems. Denmark and Germany have regulated dual Shift and polluter pays policies for creating responsible waste management approaches. Himachal Pradesh can use these techniques specially in their rural tourism areas for generating a sense of responsibility in the tourists.

4.2.3 Him-GRIH Program

Himachal Pradesh Green Rating Project for Hotels (Him-GRIH) is a state organised project under State Pollution Control Board to create & promotes sustainable practices in the hospitality sector by accrediting the hotels and homestay based on environmental and sustainable criteria of rating.

Table 8. Him-GRIH Green Star Rating Initiative

Hotel Category	Number of Hotels Rated	Rating Criteria
Large Hotels (>20 rooms)	167	Energy efficiency waste management, biodiversity conservation, sustainable infrastructure
Mid-size Hotels (5-20 rooms)	236	Water conservation, waste segregation, renewable energy integration
Small Hotels (<5 rooms)	7	Basic environmental compliance, eco-friendly infrastructure

Source: Himachal Pradesh State Pollution Control Board Official Website

Him-GRIH initiative has not only tackle the issue of illegal accommodations by pushing regulatory enforcement specially in Shimla and Manali but also advocate water saving practices to address regional water scarcity caused because of climate change and deforestations. For sustainable urban transport solutions, Him-GRIH is also countering traffic congestion and emissions in tourist hotspots like Shimla.

Table 9. Him-GRIH Sustainable Initiatives

Aspect	Current Issues	Him-GRIH Initiative
Water Conservation	70% of springs non-functional due to climate change and deforestation.	Promotes water-saving practices to alleviate local water scarcity.
Illegal Accommodations	9,000-10,000 unregistered rooms in Manali & Shimla.	Encourages regulatory enforcement and fair competition in the industry.
Tourism & Pollution	Waste mismanagement due to increased tourist influx.	Implements waste management strategies, including recycling and pollution control.
Traffic & Infrastructure	Increased congestion and emissions in Shimla.	Emphasizes sustainable transport solutions in urban planning.

Source: Himachal Pradesh State Pollution Control Board Official Website

5 Challenges & Recommendations Limitations of the study

The continued influx of tourists to the remote and rural regions of Himachal Pradesh has led to increased pressure on regional natural, cultural, and infrastructural resources by generating solid and liquid waste. The irresponsible approaches and lack of proper waste management practices became severe in collecting, segregation, and disposing of waste in too many remote and rural regions. The unfitting waste disposal not only degrades soil, harms the local ecosystem, and pollutes water sources but also disputes between guest & host communities, especially with the accumulation of non-biodegradable substances like plastic waste [10]. These situations become alarming with seasonal tourism spikes devastated with the existing waste treatment systems and inefficient municipal solid waste plants because the sustainable solid waste management initiative taken in recent years is still insufficient with the existing waste generation and management scenarios [5].

Waste management is a perilous issue, especially with inadequate resources and increased tourist footfalls. In a case when municipal waste is not 100 % treated, combating tourism waste can only be possible with proper waste quantification strategies to track and treat waste concentrated spots [8]

efforts. After the deep literature and data review, this study recommends that there should be a proportionate and targeted waste management initiative that needs to take place as the generation of waste is directly linked with the region's population density and economic stability. So, local community interventions along with waste management stakeholders are essential to reduce waste disposal and air water contamination with harmful substances like PM2.5, PM10, CO, SO2, and Nox, which exacerbate environmental and people health [9]. Sustainable strategies for treating and managing waste segregation & recycling can be achieved with local and tourist awareness through effective waste management campaigns.

6 Limitations of the study

There have been several limitations in conducting this study based on sustainable waste management practices in rural tourism sites of Himachal Pradesh. The authenticity and accuracy of rural tourism and waste management practices data remain a challenge as these data are not easily available because of a lack of systematic tracking of remote regions [5]. The study is primarily based on existing literature and secondary data, which may lack real-time waste management practices and on-ground situations in the state. Analysing the waste management practice for rural tourism in the state has been challenging, keeping its practical implementation and effectiveness. Lastly, the inconsistent collaboration between policymakers and regional stakeholders in enforcing sustainable waste management in rural regions of Himachal Pradesh limited the scalability of recommendations

7 Conclusion

Tourism has significantly contributed to the economic as well as social development of Himachal Pradesh by creating job opportunities, supporting local communities, and enhancing infrastructure, particularly in rural and remote areas of the state. This economic windfall and unregulated expansion of tourism carries considerable environmental drawbacks and natural deterioration, particularly in environmentally vulnerable zones such as riverbanks and mountain slopes [2]. The uneven infrastructure development, especially the construction of hotel resorts and other tourism facilities [9], has resulted in land degradation, deforestation, vulnerable natural disasters, and pollution, leading to flash floods and major landslide incidents in recent years. These alarming concerns demand appropriate sustainable tourism approaches to balance between economic and ecological unrest especially in rural tourism areas [10]. Government initiatives in addressing these concerns are evidential with the multi-faceted approach consisting of policy formulation & intervention, community awareness & engagement, and technological & financial support in managing tourism-generated and municipal waste [8].

Table 10. Waste Management Initiatives- Himachal Pradesh

Program	Objective	Financial Allocation
Swachh Bharat Mission – Gramin (SBM-G)	Focused on ODF sustainability & SLWM	₹103.68 crore used in 768 Gram Panchayats
Solid and Liquid Waste Management	12 clusters covering 109 Gram Panchayats for SLWM implementation	₹2.5 crore+ allocated for cluster development
Zero Waste Gram Panchayats Initiative	Target of making 500 GPs zero-waste by Oct 2, 2019	₹427.42 crore budget for 2019-20
Incinerators in Schools	Installing incinerators to manage school waste	₹3 crore allocated to Higher Education Dept.
Prevention of Waste in Water Bodies	Fixing barriers and wire meshes in rivers and lakes	₹1.82 crore allocated to Forest Dept.

Source: Govt. of HP (Solid and Liquid Waste Management Report, 2019)

Government projects like Swachh Bharat Mission-Gramin (SBM-G), Solid and Liquid Waste Management, Tribal homestay program, Zero Waste Gram Panchayats Initiative, Him-GRIH accommodation rating initiative and Cluster-Based Waste Management have become instrumental in promoting and enforcing sustainable practices in waste management. Though these initiatives have been

wellbeing in rural tourism destinations of Himachal Pradesh to ensure long term sustainability through adequate waste management practices.

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