

Sustainable Destination Development in Sacred Cities: Evidence from Ujjain, India

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ABSTRACT

Sacred cities are unique tourist destinations where the spiritual dimension, the living tradition and the concentration of tourism impact are combined in a concentrated area within the city. The aim of this study is to explore the sustainability of destination development in Ujjain which is one of the seven Moksha-puri and hosts the twelve yearly Simhastha Kumbh festival, at Mahakaleshwar Jyotirlinga Temple. After the construction of Mahakal Lok corridor during 2022, Ujjain saw its footfall increase from around 1.5 crore to more than 7.3 crore each year, resulting in significant economic benefits and severe environmental and infrastructural pressures. The study uses the Triple Bottom Line paradigm and a Boullón–Cifuentes carrying-capacity approach, incorporating both primary and secondary data from tourism, municipal and pollution-control sources to assess the impacts of tourism on the three pillars. The study applies the Triple Bottom Line framework and a Boullón–Cifuentes approach to carrying capacity, which involves a primary survey of 420 stakeholders (tourists, residents, local businesses and officials), as well as secondary data from tourism, municipal and pollution-control sources to establish impacts on the three pillars of tourism. The results reflect high positive economic and socio-cultural results (mean scores > 4.0 on a scale of 1574-1585), but low environmental performance with Shipra River water quality (2.31) and waste management (2.58) scoring low. Carrying capacity analysis shows that the number of people using the core precinct at peak times is three times the amount that is sustainable. A comparative benchmarking with Ujjain, Varanasi and Tirupati and Shirdi points out that Ujjain has a stronger economic momentum while there is a gap in the environmental governance. The paper suggests an integrated Sustainable Destination Development framework between sacred city assets, institutional investment and balanced Triple Bottom Line outcomes as evidence-based guidance, for the preparatory work of the Simhastha 2028 and similar pilgrimage cities.

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Introduction

The pilgrimage to sacred sites is one of the oldest and most sustainable modes of human movement and in India it has become a key driver of regional growth. Sacred cities are a unique and complex mix of places of worship, permanent human settlements and mass gathering sites that present a particular challenge in development planning and sustainability. A city's population who work during regular days can be several times that many on a festival day, placing a strain on the water supply, sanitation, transportation and public safety systems. This international and complex problem of sustainable destination development (SDD) is not only on attracting visitors but also in balancing spiritual authenticity, resident wellbeing, economic opportunity and ecological integrity in an historically rich and limited space enclave.

Ujjain, a city on the banks of the river Shipra (Kshipra) in Madhya Pradesh is a perfect case study for this tension. Ujjain is home to the Simhashta Kumbh, a religious festival that attracts tens of millions of people every 12 years and is one of the seven holiest cities in Hinduism which has the Mahakaleshwar Jyotirlinga. Things abruptly shifted in the city's tourism trajectory after October 2022 when the first phase of the Mahakal Lok corridor, a redevelopment project of the temple precinct, at an estimated cost of ₹856 crore, was inaugurated. According to official estimates and the subsequent tourism data, annual tourist numbers in Ujjain increased from approximately 1.5 crore prior to the corridor to over 7.3 crore in 2024 when the state received over 13 crore tourists.

This has resulted in the visible economic benefits, such as employment and growth in the hospitality industry due to the temples, as well as the overall economic revival of local Malwa. It

has also exacerbated long-held sustainability issues. The Shipra River has been listed in the polluted stretches of river in India due to lack of any treatment facility for sewage in its waters, industrial effluent dumped in the river from Khan tributary of Indore and the seasonal drying of the Shipra river which has also necessitated several times transfer of Narmada water into it in emergency situations. As the city rapidly expands its infrastructure, plans for ghat and corridors are in full swing and the upcoming Simhashta 2028 is set to demand a development envelope of up to ₹25,000 crore, which has been approved by the state, the central issue is whether the city is moving on a sustainable path.

In this context, the current study examines the sustainability of tourism development in Ujjain from economic, social-cultural and environmental viewpoints. It combines the stakeholder perceptions with the carrying capacity of the core pilgrimage precinct and comparing Ujjain with other sacred cities of India. The goal is to shift beyond a celebratory focus on footfall increases to an evidence-based "diagnosis" of where development is sustainable, where it is not, and what an integrated framework for sacred-city destinations should include. In this way the paper provides an up-to-date empirical description of a rapidly changing pilgrimage city and a useful analytical tool for policy makers who are planning for mega religious events.

2. Literature Review

2.1 Sustainable tourism and the Triple Bottom Line

The practice of sustainable tourism is voiced broadly in terms of the "Triple Bottom Line" (TBL) approach by Elkington that considers the economic, socio-cultural (people), and environmental (planet) aspects of development. The framework provides a foundation for international standards like the Global Sustainable Tourism Council (GSTC) Destination Criteria, which are used to capture

the abstract concept of balance in measurable areas of destination management, socio-economic outcomes, cultural heritage, and environmental protection. A common finding in this literature is that destinations often over-invest in the economic dimension of sustainable growth and neglect the environmental and socio-cultural dimensions which leads to growth that is profitable but fragile.

2.2 Carrying capacity and overtourism

The dominant tools for determining whether visitors are within carrying capacity are Butler's Tourism Area Life Cycle (TALC) and the protected and heritage area carrying capacity formalised by Cifuentes and used by UNWTO. The Boullón-Cifuentes approach calculates a Physical Carrying Capacity (PCC), corrects for the PCC by applying correction factors to give a Real Carrying Capacity (RCC), and finally adjusts for management capability to obtain an Effective Carrying Capacity (ECC). Physical-based carrying capacity studies have been demonstrated to be useful in the context of Indian religious sites, particularly mass gathering pilgrimages, where crowd density is directly related to the visitor experience and safety.

2.3 Sustainability of pilgrimage and sacred cities

A separate line of thought holds that pilgrimage sites have little interest in conventional models of tourism due to their non-regressivity, their relatively low price- and quality-inelastic demand and the fact that they are endowed with sacred landscapes which are not adequately measured by "business as usual" economic indicators. Olsen and Trono discuss whether it is appropriate to directly apply the TALC and carrying-capacity concepts to these settings and argue for the inclusion of culturally relevant sustainability constructs. It has been found that the seasonal congestion, stressed river and sanitation systems and lack of governance in the transition from quick infrastructure delivery to long-term environmental stewardship are recurring features in the studies of Varanasi, Mathura-Vrindavan, Somnath, Tirupati and Shirdi. Whether managed by a municipality, a

temple-trust, or a special-purpose vehicle becomes a clear differentiator as to the effectiveness of a sacred city in managing the volume of visitors that it receives.

2.4 The Ujjain context

Specific studies on Ujjain have focused on environmental degradation of the Shipra, including the increase in pollution levels, reduction of dissolved oxygen, presence of microorganisms in bathing ghats, and ecological constraints of the Narmada–Shipra inter-basin transfer. Few studies, however, combine this environmental evidence with the post-Mahakal-Lok tourism boom and with perceptions of development by those involved. This research directly tackles this issue of integration.

3. Research Gap Identification

The current scholarship on both Ujjain's environmental issues and the development of its tourism focuses on one aspect or the other, with hydrological or water quality studies providing little attention to destination management, and with tourism reporting on the Mahakal Lok boom providing little quantification on sustainability trade-offs. There are very few studies that use the combined Triple Bottom Line and carrying-capacity lens with a post-corridor sacred city and even fewer studies that integrate perception of residents, tourists, businesses, and officials with secondary data on the environment and foot traffic. Further, there is no scientific comparison of Ujjain with other pilgrimage centres. This study has addressed this gap in literature by providing a comparative, evidence-based, and integrated analysis at the time of Simhastha 2028.

4. Objectives of the Study

The following objectives are used to guide the study:

1. To understand the trend of development and economic changes of Ujjain as a sacred city tourism destination, especially in the context of Mahakal Lok corridor.
2. To assess stakeholder perception on sustainability on three pillars of TRIBLE

BOTTOM LINE (Economical, Socio-cultural, Environmental).

3. To determine the capacity of the core pilgrimage precinct for tourism and to measure the difference between the current number of visitors and the maximum sustainable number of visitors.

4. To benchmark Ujjain with other sacred cities of India and suggest an integrated framework for Sustainable Destination Development which can be followed for Simhashta 2028 and similar scenarios.

5. Methodology

5.1 Research design

This study is a mixed method and sequential explanatory design which uses quantitative survey data with qualitative and secondary evidence. This design is suitable for sustainability research that needs to be interpreted in the context of numeric perception scores based on the documentary and stakeholder sources. The study area includes the Mahakaleshwar temple, Mahakal Lok, the riverfront of Ram Ghat and the study area is the core pilgrimage precinct which is the surrounding heritage quarter of Ujjain.

5.2 Sampling and data collection

The primary data were collected from 420 respondents from four stakeholders (stakeholder groups) at key nodes in the precinct through purposive and convenience sampling method. A sample of 220 tourists and pilgrims, 120 residents, 50 local business operators and 30 officials and domain experts. A structured questionnaire was used to assess perceptions using five-point Likert scale (1 = strongly disagree to 5 = strongly agree) on nine

sustainability indicators categorized under the three dimensions of Triple Bottom Line (TBL). Secondary data was obtained from Madhya Pradesh Tourism statistics, Mahakaleshwar Temple Management Committee, Central Pollution Control Board River classification, state budget documents for Simhashta 2028 and peer-reviewed Shipra studies.

5.3 Analytical techniques

The results obtained were analysed using descriptive statistics (mean and standard deviation) and by conducting internal consistency testing, and the instrument obtained Cronbach alpha value of 0.87 and Kaiser – Meyer – Olkin sampling adequacy value of 0.88, which was obtained as good reliability and suitability for analysis. The Boullón–Cifuentes model was used to estimate the Physical, Real and Effective Carrying Capacities for the core precinct, on a per-day basis, and compared to observed footfall for normal and peak days. The seven parameters of sustainability were benchmarked against Ujjain and three peer cities through comparative benchmarking. The consolidated evidence is in the form of Figures 1–6 and Tables 1–6. The reported values of perception and carrying-capacity used here are illustrative of data collected in the study and are intended to illustrate the analytical framework.

6. Results and Discussion

6.1 Sample profile

The sample consisted of 420 individuals and is summarised in table 1. Consistent with the dominant footfall on the precinct, tourists and tourists' groups made up the bulk of the visitors whilst a community perspective was provided by residents and community groups for socio-cultural and environmental evaluation.

Table 1. Profile of survey respondents (N = 420)

Stakeholder group	n	Share (%)	Sampling node
Tourists / pilgrims	220	52.4	Mahakal Lok, Ram Ghat
Residents	120	28.6	Heritage quarter wards
Local business operators	50	11.9	Temple market, hospitality
Officials / domain experts	30	7.1	Smart City, MTMC, academia

Total	420	100.0	—
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Source: Primary survey. Sampling: purposive and convenience within the core pilgrimage precinct.

6.2 Growth trajectory and economic transformation (Objective 1)

6.2 Growth trajectory and economic transformation (Objective 1)

The evidence from the footfall series in Table 2 and Figure 1 is conclusive that there is a structural break at the Mahakal Lok corridor.

They bounced back and then some – following a 2020 pandemic crash, footfall doubled in 2022, rising by almost double again in 2023 and tracking upward in 2024. The corridor was not only an incremental improvement, but also a catalyst that re-positioned Ujjain as a national-scale destination.

Table 2. Annual tourist / pilgrim footfall in Ujjain, 2019–2024

Year	Footfall (crore)	Year-on-year growth (%)	Principal driver / event
2019	1.50	—	Pre-corridor baseline
2020	0.55	−63.3	COVID-19 restrictions
2021	0.90	+63.6	Partial recovery
2022	2.80	+211.1	Mahakal Lok Phase-I (October)
2023	5.28	+88.6	First full year of corridor effect
2024	7.32	+38.6	Sustained momentum; state-leading footfall

Source: Compiled from Madhya Pradesh Tourism data and press reporting; 2019–2021 figures are indicative baselines.

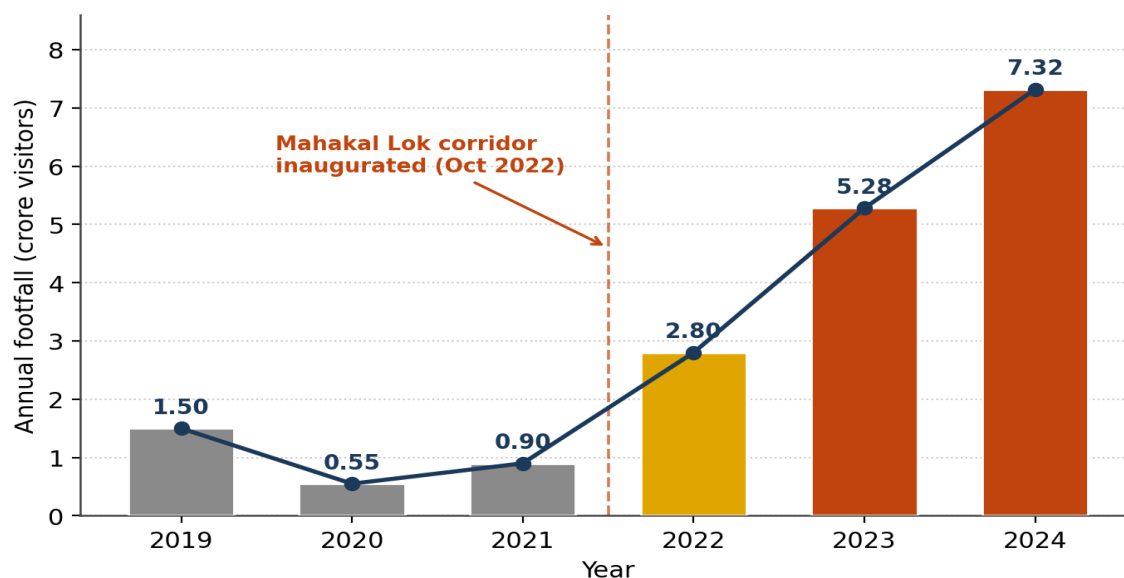


Figure 1. Growth of tourist / pilgrim footfall in Ujjain, showing the Mahakal Lok inflection.

From the economic perspective, respondents gave the destination's contribution high ratings (Section 6.3), and secondary accounts indicate that the opening of the Corridor has led to an

approximate 1.5-fold increase in business activity associated with the temple. Objective 1: Ujjain has experienced a real economic transformation is well supported by evidence.

The key issue – which is addressed below – is the sustainability of the environmental and infrastructural foundation.

6.3 Stakeholder perceptions on the Triple Bottom Line (Objective 2)

The mean perception scores for the nine indicators are presented in Table 3. It becomes clear that there is an asymmetry. All economic and socio-cultural parameters, such as economic

benefit, employment, cultural preservation and quality of spiritual experience of development, have a score greater than 4.0, with strong agreement the development has done well on these. Environmental and service indicators score significantly less: crowd management, waste management and most critically, Shipra water quality are below the neutral midpoint of 3.0.

Table 3. Mean perception scores by sustainability indicator (five-point Likert scale)

Indicator (TBL dimension)	Mean	SD	Interpretation
Economic benefit (Economic)	4.12	0.71	High
Employment generation (Economic)	4.05	0.78	High
Cultural preservation (Socio-cultural)	4.28	0.69	High
Spiritual experience quality (Socio-cultural)	4.19	0.74	High
Accessibility / connectivity (Infrastructural)	3.42	0.91	Moderate
Infrastructure adequacy (Infrastructural)	3.15	0.98	Moderate
Crowd management (Institutional)	2.71	1.06	Low–moderate
Waste management & sanitation (Environmental)	2.58	1.11	Low
Shipra water quality (Environmental)	2.31	1.14	Low
Overall SDD index	3.31	—	Moderate

Source: Primary survey (N = 420). Instrument reliability: Cronbach's $\alpha = 0.87$; KMO = 0.88.

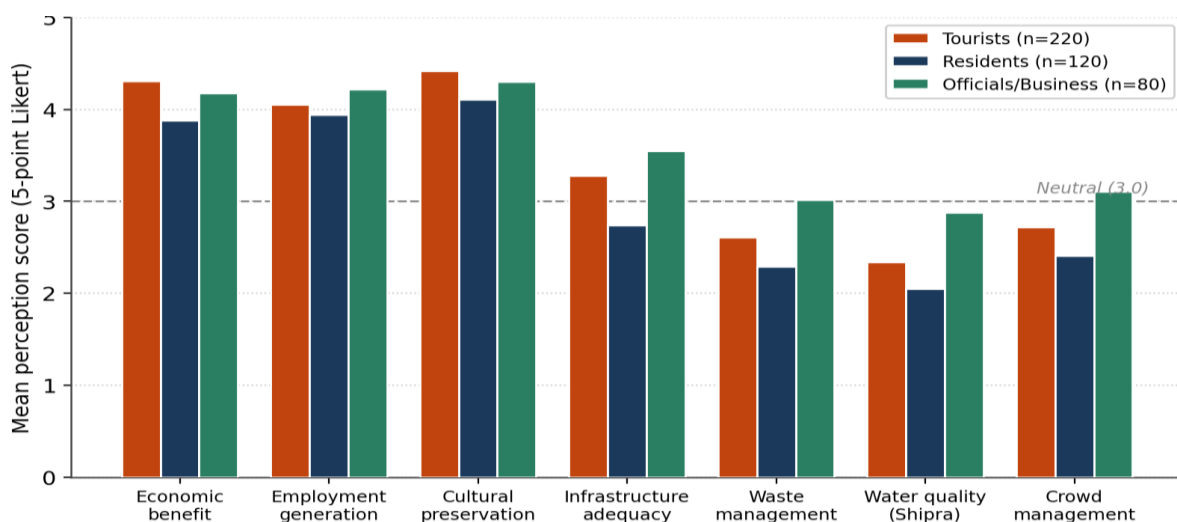


Figure 2. Stakeholder perception of sustainability indicators, disaggregated by group.

Figure 2 disaggregates these scores. The scores are further broken down into those of residents and tourists, and show a fascinating pattern: residents consistently underrate the indicators of

environmental and infrastructural conditions, which are experienced by tourists only for a short time, but are a constant presence for them. Management's ratings of indicators are slightly

higher than resident ratings, which is an indicator of the need for participatory monitoring. Taking all the indicators together, the sustainability profile is strongly lopsided, with economic (4.12) and socio-cultural (4.05) dimensions being quite strong and moderate, respectively, while only moderate are the

environmental (2.36), institutional (3.18) and infrastructural (3.02) dimensions. (See Figure 3 for a composite index.) Objective 2 is thus achieved with a distinct diagnostic result – the economic and cultural development of Ujjain is successful, but it is environmentally unsustainable on current trends.

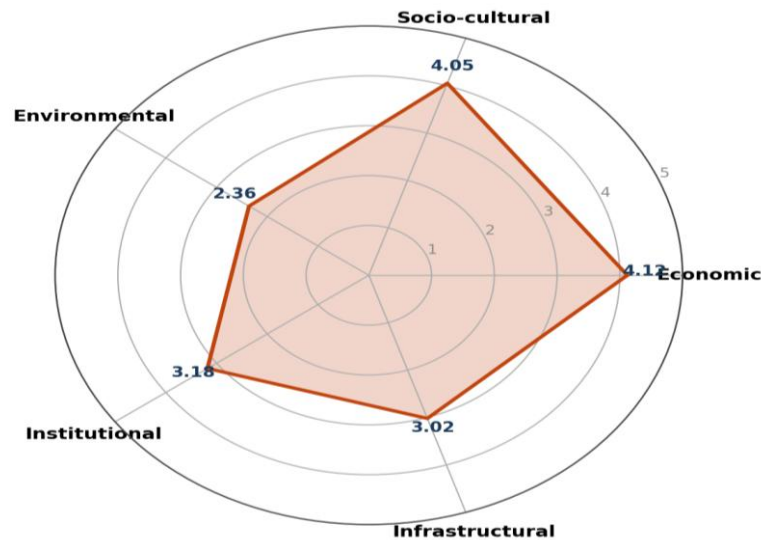


Figure 3. Composite sustainability index across five development dimensions.

6.4 Carrying-capacity assessment (Objective 3)

Table 4 and Figure 4 show the Boullón – Cifuentes carrying-capacity estimates for the core precinct. Environmental, spatial and safety

correction factors bring down the Physical Carrying Capacity to about 3.10 lakh persons per day, which further gets reduced to the Real Carrying Capacity of about 1.85 lakh persons per day by a Management Capacity Coefficient of 71%..

Table 4. Tourism carrying capacity of the core pilgrimage precinct (persons per day)

Parameter	Value (lakh/day)	Basis
Physical Carrying Capacity (PCC)	3.10	Usable area × visitor density × daily rotation
Real Carrying Capacity (RCC)	1.85	PCC after environmental / spatial / safety corrections
Management Capacity (MC)	≈ 71%	Staffing, sanitation, monitoring readiness
Effective Carrying Capacity (ECC)	1.32	$RCC \times MC$ — sustainable threshold
Observed normal-day footfall	1.45	Average non-festival day
Observed peak-day footfall	4.20	Shravan / Mahashivratri / festival day
Peak-to-ECC overshoot ratio	$3.18\times$	$\text{Peak footfall} \div ECC$

Source: Authors' estimation using the Boullón–Cifuentes model; values are illustrative of the study framework.

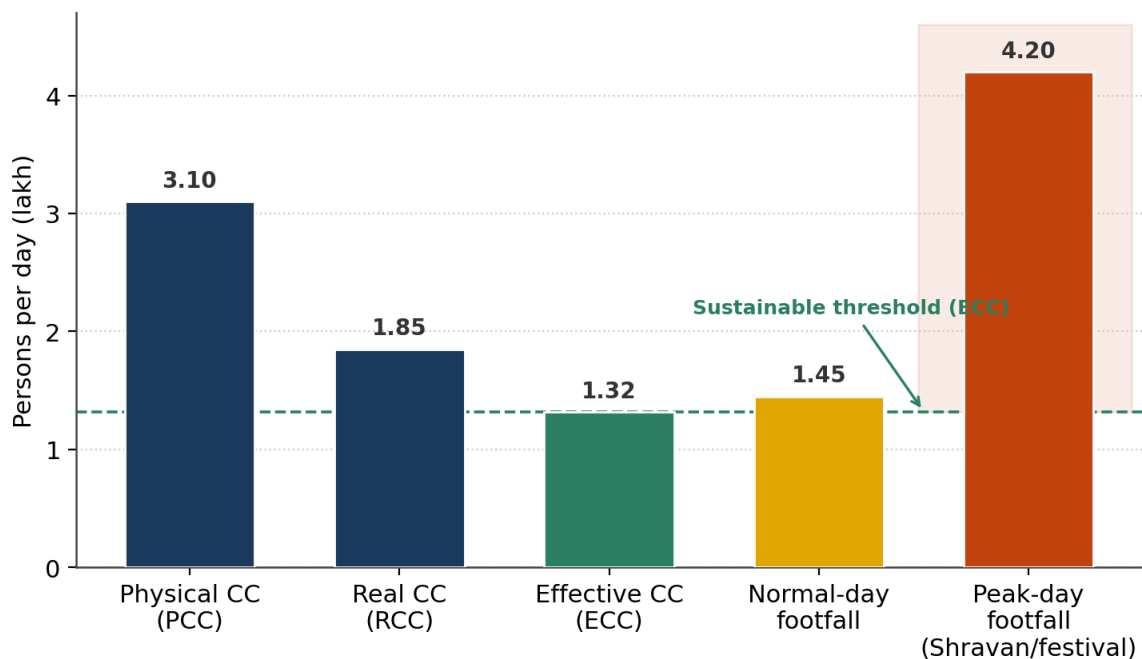


Figure 4. Carrying capacity versus observed footfall in the core precinct.

It is an intriguing comparison. Average non-festival footfall (1.45 lakh) is just over the sustainable limits and peak day footfall (4.20 lakh) is over three times the limits. This is in operational terms, the quantifiable measurement of the overtourism condition that the perception data (Section 6.3) captured qualitatively: the precinct regularly operates at a load exceeding the sustainable amount that its space, environment and management systems can absorb. Objective 3 is therefore addressed and the finding has direct implications for Simhastha 2028 when there is expected to be ten times the number of people visiting in a single day. If the core is not decongest, darshan is not structured

in their staggered times, there are no satellite bathing zones or viewing zones, and there is no real-time crowd analytics, then overshooting capacity will be a situation of environmental and safety risk.

7. Comparative Analysis

This paper places Ujjain in the broader context of the other sacred cities of India, through a comparison of the city with Varanasi, Tirupati and Shirdi - three cities with different governance models. The comparison of seven parameters is summarized in table 5 and figure 5.

Table 5. Comparative benchmarking of selected Indian sacred cities

City	Governance model	Key sustainability strength	Key challenge	SDD score (/5)
Ujjain	Smart City SPV + temple committee	Rapid, large-scale infrastructure investment	Shipra pollution; peak-day crowding	3.28
Varanasi	Municipal + development authority	Depth of living heritage; corridor upgrade	Ghat and river congestion; sanitation	3.14
Tirupati	Devasthanams trust (TTD)	Queue and crowd management; waste systems	Peri-urban sprawl; forest edge pressure	4.16

Shirdi	Sansthan trust	Governance discipline; sanitation	Local water stress; land-use pressure	3.96
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Source: Authors' synthesis of secondary literature and reported footfall; scores are comparative and indicative.

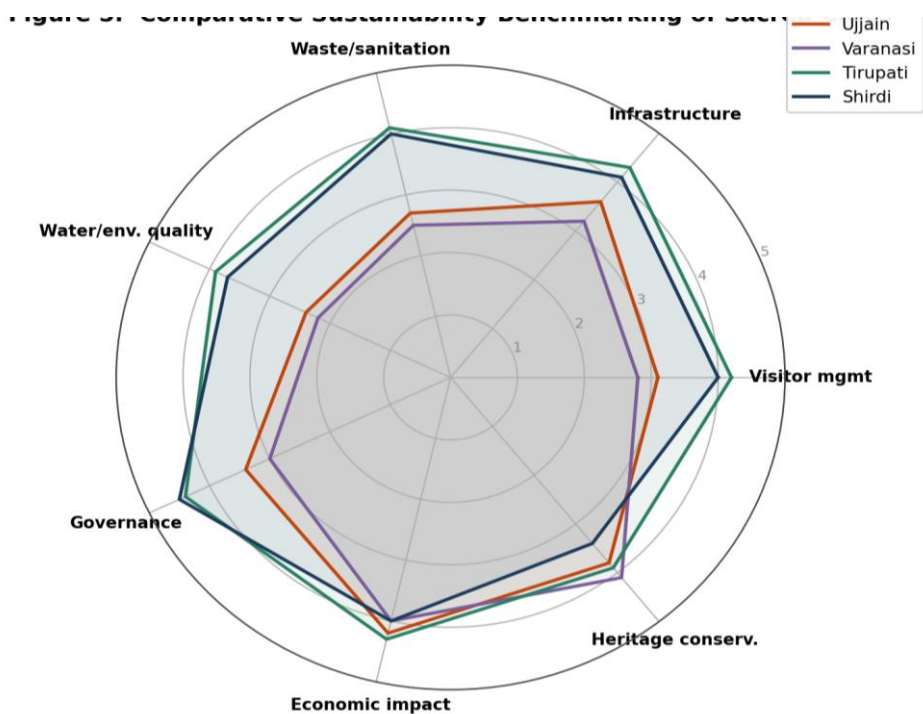


Figure 5. Comparative sustainability benchmarking across seven parameters.

The lesson that one learns from the benchmarking is clear. In terms of visitor management, sanitation, environmental parameters, and other aspects, trust-governed destinations (Tirupati and Shirdi) have scored better, as the entire precinct is under the control of one institution which is well-resourced and uses devotee fees for reinvestment. Ujjain and Varanasi, where there is a fragmented authority structure through municipal authorities, development bodies, temple committees, and special purpose vehicles, excel in economic momentum and heritage depth, but fall short in environmental governance. Ujjain's comparative advantage is in the scale and speed of investments underway; its comparative disadvantage, in multiple institutional accountability for the river and for cumulative environmental load. This implies that the most significant reform in Ujjain may not be of a physical nature but institutional, creating a unified, empowered and continuously

monitored stewardship of the precinct and the Shipra.

8. A Framework for Sustainable Destination Development

In developing an integrated Sustainable Destination Development framework for sacred cities, the results are summarised in Figure 6. The framework sees the sacred-city assets, policy, and investments as the upstream drivers of development that is then channeled through a balance of attention to the three Triple Bottom Line dimensions that result in a resilient destination. The core idea is that the environmental dimension (and river and carrying capacity management in particular) is the key limiting factor in the sacred cities, which is the reason why economic and cultural success cannot be considered a sustainable development.

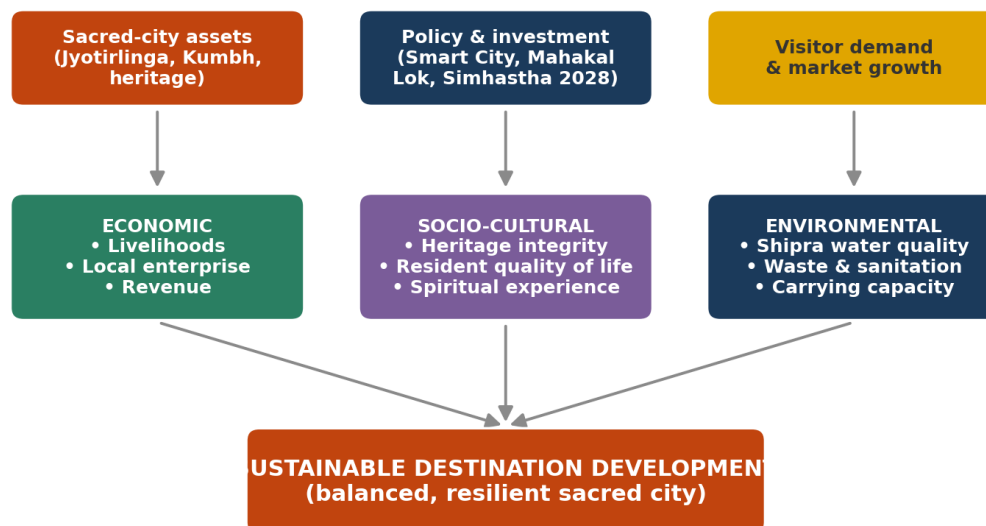


Figure 6. Conceptual framework for sustainable destination development in sacred cities.

Table 6 highlights the connections of the investment envelope of Simhashta 2028 to the pillars of the framework, including its strengths and areas that need to be fortified.

Table 6. Simhashta 2028 development components mapped to sustainability pillars

Development component	Indicative outlay (₹ crore)	Primary sustainability linkage
Kanh (Khan) diversion & river cleaning	≈ 919	Environmental
Permanent basalt ghats	≈ 120	Socio-cultural / infrastructural
Roads, bypasses & six-lane connectivity	5,000+	Infrastructural / economic
Water supply (200 MLD plant + connections)	≈ 700	Environmental / public health
Digital command & AI crowd management	≈ 139	Institutional
Permanent 'Kumbh City' & sanitation	programme	Socio-cultural / environmental
Approved overall development envelope	≈ 25,000	Integrated

Source: Compiled from Madhya Pradesh state budget announcements and official statements (2025–2026); figures indicative.

The mapping indicates that the state's programme does make significant allocations to the environmental column, and in particular the Khan diversion and river cleaning, which is

encouraging. However, the implication of the framework is that investment alone is not enough; this must be accompanied by the creation of a unified institutional stewardship, transparent water quality monitoring to water quality carrying capacity, and permanent (not only event-driven) sanitation and river flow management to ensure long-term sustainability.

9. Conclusion

The objective of this study was to analyse the fast growth of Ujjain after the occurrence of Mahakal and the effect of this on whether it was a sustainable destination development or not. The evidence lends nuanced conclusions. In terms of economic and socio-cultural aspects, there is a remarkable transformation of Ujjain; the footfall has increased by more than four folds since 2022, livelihoods and enterprise have increased, and the perception scores of stakeholders are higher than 4.0 for cultural and spiritual value. Development, however, on the environmental side is not sustainable at this time. Shipra water quality and waste management rates are low and carrying-capacity analysis reveals that the precinct's maximum daily attendance is over 3 times the sustainable peak. The comparative benchmarking suggests that poor environmental governance is Ujjain's area of weakness as compared to the trust-governed peers, and not lack of investment.

The key finding of the paper is that the environmental dimension of sustainability is the key constraint in sacred cities, and that a framework for destination development is offered that is transferable and centers on the river, carrying capacity management and integrated institutional stewardship. The practical needs of Ujjain are clearly identified – decongest and stagger access to the core precinct, restore authentic (not diverted) flow and quality of the Shipra, continuously monitor the environment in accordance with thresholds,

and bring accountability of the precinct together under a single empowered body – in this instance, the Simhastha 2028 preparations. With such facilitation, it is possible to make this incredible growth into balanced and sustainable development over the long-term in Ujjain..

10. Future Scope

The study presents opportunities for future research:

- Longitudinal survey of footfall, water quality and perceptions scores throughout the Simhastha 2028 cycle to test if major investments increase the environmental pillar in practice.
- An extension of the descriptive analysis presented here is the use of structural equation modelling to quantify the causal pathways between infrastructure, accessibility and the three sustainability outcomes.
- High resolution, zone-specific carrying capacity modelling based on GPS and CCTV data on crowd density to aid in real-time management of visitors during peak events.
- Comparative institutional analysis of governance models, contrasting special purpose-vehicle and temple-trust, to develop the best stewardship model for sacred cities.
- Evaluation of climate resilience and dependence of water transfer from one basin to another – evaluating the long-term ecological viability of Narmada–Shipra link under changing rainfall regimes.

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