



Empirical Research Article

Smart Tourism- A Solution for Tourism Challenges in Himachal

Sahil Sharma*

Institute of Vocational Studies, Himachal Pradesh University, Shimla, India

Abstract

This paper shows light on the concept of smart tourism destination as a future of tourism development, especially in the context of problems associated with developing countries. This study substantiates the case of smart tourism development in mountain destinations as an affordable and needed future of the contemporary era. This conceptual study is based on secondary literature on Smart Cities, Smart Tourism Destinations, and Tourism in Himachal Pradesh. The Indian state of Himachal Pradesh has been considered as a study area to acknowledge major tourism-related challenges, especially in mountain locations. Consequently, the dots are connected between existing challenges and solutions that smart tourism holds. It turns out that for the development of mountain tourism destinations such as Himachal Pradesh in the Indian Himalayas, investments in smart infrastructure are required. By developing smart infrastructure, a new USP can be made, a supportive environment for new local businesses, new employment opportunities, enhanced tourist experience and an overall raised standard of living for locals. Considering all factors, it leads to a highly competitive tourism destination. All tourism destinations located in the Himalayan mountains show somewhat the same tourism challenges as Himachal Pradesh, India. Therefore, this paper brightens the path of destination planners towards the development agenda of smart tourism destinations and shows how smart tourism infrastructure can be deployed for better management of tourism destinations.

Keywords

Smart Cities; Smart Tourism Destination (STD); Himalayas; Himachal Pradesh; development; technology; tourism

1. Introduction

Origin of Smart Tourism Destination concept is an outcome of Smart-Cities agenda. While Smart cities are the result of considerable development in modern technology and human knowledge. Both together seek an alternative approach to operating cities in order to enhance the standard of living. A recent estimate from United Nations projects that 70% of the World's population will be living in the Cities by 2050. Also, the Indian Government have estimated that by 2030 about 40% of its population will be living in Urban Areas; and the same urban population will be contributing approximately 75% to India's GDP (GOI, 2021). Growing Urban populations are posing challenges for administration worldwide (Cavalheiro et al., 2020). Tourism-led rapid urbanization in Indian Himalayas has become a threat to the environment as well as to its residents' quality of life (Singh, 2008).

The smart Cities phenomenon helps solve over-population-related issues (Cavalheiro et al., 2020). Smart Cities mainly focus on their residents to increase their standard of living by integrating technology into the city's overall infrastructure (Boes et al., 2015). Technology integration in the city's overall infrastructure is just a part of the overall smart city agenda and a city cannot be called Smart City if its focus is only on technology or digitalization. Smart Cities use technology infrastructure in order to provide better services to their citizens like transportation, education, efficient use of resources, citizen participation, and good quality of life (Chahal & Kaushal, 2017).

According to a report, Singapore, Helsinki, and Zurich are the top three Smart Cities in the world (Lai, 2021). Also, a study by the European Union (EU) Barcelona, Amsterdam, and Helsinki are the top three cities that have the most innovative smart solutions in European cities (Boes et al., 2016). Meanwhile in South Asia, India has undertaken human history's largest urbanization effort which aims to develop more than 100 smart cities soon (Ratti, 2018).

Besides Smart Cities Development worldwide another variation of this concept is emerging in Tourism namely Smart Tourism Destinations (STD) (Buhalis & Amaranggana, 2013; Cavalheiro et al., 2020). Smart tourism is a growing field of research in its early stages (Boes et al., 2015, 2016). While the focus of smart cities is on their citizens; Smart Tourism go beyond and adds a focus on enhancing the experience of tourists and visitors at the destination (Cavalheiro et al., 2020).

Himachal is a popular Tourism Destination in the Indian Himalayas. Since time immemorial, Himachal Pradesh has been the most preferred tourist destination due to its natural and scenic beauty. Tourism significantly contributes to economic growth, and employment generation, and the state government has prioritized tourism development over the previous years (Kuldeep & Virender, 2019; Parmar, 2012). Himachal has unique natural offerings, and the state cannot cash upon them due to various lacking facilities (Kuldeep & Virender, 2019; Rishi & Giridhar, 2007). Himachal found lacking in core necessities provided to tourists such as basic amenities, food and water, and proper infrastructure (Transport and Accommodation) (Rajpurohit et al., 2015). There is a need for IT integration in the

*Corresponding author:

Sahil Sharma, Institute of Vocational Studies, Himachal Pradesh University, Shimla, India

E-mail address: sahilsharmahimalaya@gmail.com

Received 14 March 2022; Received in revised form 17 April 2022; Accepted 21 April 2022

Tourism industry of Himachal, preferably in the form of a single online platform or an app where all stakeholders are integrated; and the platform shall offer services such as booking transport, accommodation, local guides, and so on (Chetan Sharma, 2019; Rajpurohit et al., 2015). Two touristic cities in Himachal (Shimla and Dharamshala) are being developed under India's 100 Smart Cities Mission which can be utilized as smart tourism labs.

This paper postulates some innovative ideas under the guise of smart tourism destinations which helps in tackling a range of present challenges in the tourism industry of mountain destinations like Himachal Pradesh. Development of Smart Tourism Destinations positively impacts the tourist experience, stakeholder coordination, and environmental conservation and provides an overall raised standard of living for their residents as well as the visitors.

2. Methodology

2.1 Research Objectives

- To provide a brief background on Smart Cities, Smart Tourism Destinations and the Smart City projects in Himachal.
- To acknowledge all tourism-related challenges in Himachal.
- To provide discussion on how Smart Tourism Destination development can alleviate present tourism challenges in Himachal.

2.2 Himachal Pradesh as Study Site

Himachal literally means the "abode of snow." Himachal Pradesh is located in north India under the lap of the western Himalayas. Since it was opened to the outside world, Himachal has been the most popular tourist destination due to its natural and scenic beauty. Every year Himachal receives around 16.5 million domestic tourists and 3,83,000 foreign tourists; and the tourism industry contributes about 7% to the state's GDP (ibef.org, 2021). In recent years Himachal has become a Mass Tourism Destination. Overall Tourist footfall is mostly confined to three districts: Shimla, Manali and Dharamshala. Mass Tourism confined to some limited areas is posing significant challenges for the overall society, due to a direct result of tourism growth in the state. Environmental Sustainability is on the verge as these natural areas are being converted into concrete jungles of many Hotels. The rapid increase in the construction of many hotels is the direct result of accommodation demand created by the mass tourists. During the peak tourist season, thousands of tourist throng to these small places which creates a serious havoc. Traffic jams, over-tourism, increased pollution and together affects local civilian life as well. After Covid-19 these places are even more preferred by the tourist. Therefore, there is a rising need to manage these tourism destinations smartly in order to maintain sustainability, enhance the tourist experience and improve the overall standard of living in these places.

Smart Cities are being developed in Himachal such as Shimla and Dharamshala. Smart Cities can help in the making of Smart Tourism Destinations (Buhalis & Amaranggana, 2013). Therefore, a need for this paper emerges which could show -the what, why and how- of Smart Tourism Destination development in Himachal. All the present challenges in Himachal can be alleviated to a certain extent if the Smart Destination development agenda is adopted in the state.

2.3 Research Methods

This paper is designed as a conceptual study to address the present tourism challenges in Himachal and link them with potential solutions under Smart Tourism Destination. This paper

shows what is smart tourism (Background), why Himachal need smart tourism (Challenges) and how smart tourism can be developed (Opportunities). Conceptual research is conducted by observing and analyzing the present information on the topic (QuestionPro, 2021). In Tourism one specific type of conceptual study focus on *applying the concepts to practice* (Xin et al., 2013). Through this study, the researcher aims to do the same: Applying the concept of smart tourism destination to present tourism challenges that would result in the creation of smart destination. We need a smart destination because they not only enhance citizens' quality of life but also enhances the tourist experience at the destination (Cavalheiro et al., 2020). Also, the tourist destinations that are working toward becoming "smart" gain a competitive advantage (Buhalis & Amaranggana, 2013) which is instrumental in the overall prosperity of the society that depends for their living on the destination. Current information on the topic was collected from various books, research papers, government documents and newspapers. Based on the available information, all tourism-related challenges were framed under some common themes which are then addressed using the opportunities under smart tourism destinations. Both challenges and opportunities are linked using which shows a way forward for the destination to become a smart one.

3. Background

3.1 Smart Cities

The Smart Cities concept represents an environment where technology is embedded in cities' overall ecosystem (Buhalis & Amaranggana, 2013). Smart Cities primarily focus on increasing the quality of life for residents through "Information and Communication Technology (ICT)" (Boes et al., 2015). ICT-enabled cities' ecosystem helps bring better services to its people that result in the population's overall well-being, smooth transportation system, quality education, effective & efficient use of resources, energy savings, and quality of life (Chahal & Kaushal, 2017). Smart cities' infrastructure provides real-time information on public transportation networks (Buhalis & Amaranggana, 2013) and parking availability.

The Smart Cities concept lacks in common consensus for definition (Boes et al., 2015; Ministry of Urban Development, 2015). Despite the unavailability of a universally accepted definition of Smart Cities, various scholars have given adequate clarity on this concept. The "Smart cities wheel" constructed by Boyd Cohen; establishes a Smart city on six key dimensions - Smart People, Smart Economy, Smart Environment, Smart Government, Smart Living and Smart Mobility (Cohen, 2018). These six areas had been further divided into 3-3 indicators, as shown in Figure 1.

India sets a great example in this area by initiating the development of 100 Cities as "Smart Cities." This mission aims to provide core infrastructure, decent quality of life, a Clean and Sustainable Environment, and Smart solutions in the city's overall infrastructure (GOI, 2021).

Based on present information available on the internet some key features of Smart Cities can be identified as the following:

- **Smart Road-** Includes high-end features: Separate Cycle Lane, Underground Electrical Lines, Surface Runoff for Rain Water, Smart Lighting, Footpath for Pedestrians.
- **Smart Parking-** Real-Time information on Parking Space Digitally, Automatic Fare Collection System, Automatic Detection of Parking Violators, etc.
- **Smart Street Pole-** Full features Smart Poles include Intelligent LED lights, 4G & 5G Network Availability, City Wi-Fi, Sensors to detect Air Quality and Temperature, Electric Vehicle Charging Points, SOS Function, and Surveillance Camera.

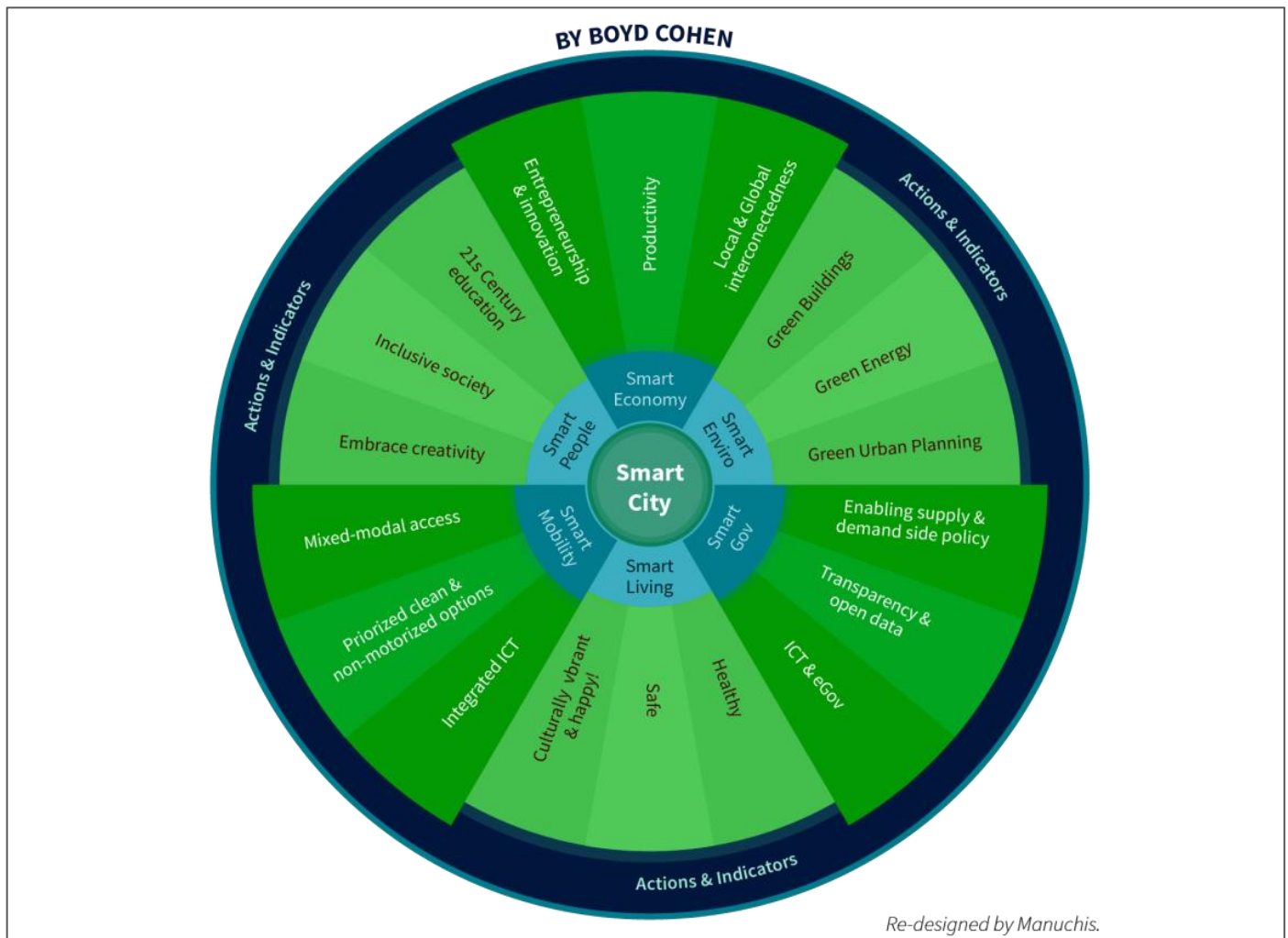


Figure 1. Smart Cities Wheel by Boyd Cohen (Source: www.boydcohen.medium.com)

- **City App-** Provides a platform for sharing information digitally and includes services such as live searching for Parking, Locate Public Transport, Water Bill, Electricity Bill, Tenant Accommodations, and so on.
- **Smart Living Labs-** Living labs bring policymakers, city governments, residents, and research institutions together, who use this place to deliberate on problems such as traffic congestion, flooding, the need for green cover and other city-specific issues. Globally these labs have taken institutional forms under city government, universities, or by the efforts of residents (Padmanabhan, 2021).
- **Environment Targets-** Without Environment Conservation targets, no city can become a Smart City. It is being observed among some of the world's top Smart Cities that equal focus has been given to Environment Conservation by setting targets. For Example, Helsinki, the capital of Finland, aims to become Carbon Neutral by 2035. Carbon Neutrality will be achieved by reducing traffic emissions by 69%, transitioning to electric vehicles, and reducing emissions from buildings by 80% (Lai, 2021).

Smart Cities mainly focus on citizens' standard of living and lack a specialized focus on tourists or visitors which brings us to the concept of Smart Tourism Destination (STD).

3.2 Smart Tourism Destinations

The concept of Smart Tourism Destinations emerges from the development of Smart cities (Buhalis & Amaranggana, 2013). Today technology is a basic need for humans. Organizations are

equipped with technology to bring-in efficiency & effectiveness in work. Integration of technology creates synergy among organizations, departments, and communities. Similarly, in the context of Tourism destinations, Smart technology can be utilized for enhancing the tourist experience. Through technology, destinations can address travelers' needs before, during, and post-trip, which increases destinations' competitiveness levels (Buhalis & Amaranggana, 2013).

Smart Tourism destinations can be imagined as places utilizing technological tools to enable demand & supply to co-create experiences for the tourist and socio-economic benefits for the destination (Boes et al., 2015). Smart Tourism Destinations enhance the tourist experience by providing online solutions for tourists' essential needs during travel. Smart Tourism Destinations help tourists during the consumption phase of tourism products of the destination, which helps to enhance the tourist experience. Better tourist experience benefits Destinations through positive word-of-mouth and revisits by the tourist. Greater Tourist Experiences lead to an overall competitive & profitable tourism destination.

There are very few study that aims to demystify the concept of Smart Tourism Destination (Table 1). So, we need more research studies which will bring more clarity on the concept of Smartness in tourism destinations. (Boes et al., 2016) conceptualizes and argues that Information Communication Technology (ICT), Leadership, Innovation, and Social Capital supported by human capital are core components of Smartness. They say ICT is just a facilitator, and it is not possible to bring in Smartness with a sole focus on technology. On leadership, they say there is no standard leadership style responsible for the success of Smart cities. It is critical to have strong leadership and the determination of authorities to deliver Smartness. Every Smart

City is situated in different contexts, so they require area-specific innovative solutions. Living Labs are an excellent example of Smart cities where innovative solutions are brought by human capital. Social and human capital is considered a fundamental base for development.

Bringing Smartness into Tourism Destinations require dynamically interconnected stakeholders through a technological platform on which information relating to tourism activities is exchanged in real-time (Buhalis & Amaranggana, 2013). Similarly, Smart places emphasize the dynamic interaction between key actors to simultaneously increase competitiveness and enhance the quality of life (Boes et al., 2016). Smartness includes the innovative and transformative changes enabled by ICTs at the destination (Boes et al., 2015). Therefore, technology plays a crucial role in the dynamic exchange of information between

destination stakeholders or actors, leading to competitiveness and enhanced quality of life.

Smart Tourism Destinations should be built on top of the constructs of Smart cities (Boes et al., 2015). The development of Smart tourism destinations takes advantage of innovations established in the context of the Smart city wheel dimensions focusing on supporting the 6A (Attractions, Accessibility, Amenities, Available Packages, Activities, and Ancillary Services) components of Tourism Destination (Boes et al., 2016). The overall infrastructure in Smart Cities focuses on increasing the standard of living for their residents. However, the Smart Tourism Destination adds to it by primarily focusing on tourists. The literature is still limited on the Smart Tourism Destinations concept (Cavalheiro et al., 2020). Therefore, more research is needed on the STD concept.

Table 1. List of landmark studies that contribute to defining the concept of Smart Tourism Destination

Author	Title	Contribution
Buhalis & Amaranggana (2013)	Smart Tourism Destinations	This paper gives a conceptual framework for Smart Tourism Destinations by taking advantage of Smart Cities' development.
Boes et al. (2015)	Conceptualizing Smart Tourism Dimensions	This paper argues that Leadership, Social Capital, and Innovation are the fundamental constructs of smartness.
Boes et al. (2016)	Smart tourism destinations: ecosystems for tourism destination competitiveness	Based on service-dominant logic this study conceptualizes smartness and argues that ICT, Leadership, Social Capital and Innovation are the core components of smartness.
Cavalheiro et al. (2020)	Towards a Smart Tourism Destination Development Model: Promoting Environmental, Economic, Socio-cultural and Political Values	This paper proposes a Smart Tourism Destination Model which highlights a strategic path for destinations to become smart one.

3.3 Smart City Projects in Himachal

Under the 100 Smart Cities Mission of India, two of Himachal's cities (Shimla and Dharamshala) have been selected for Smart City Development, according to proposals these projects will finish by 2022.

3.3.1 Smart City Proposal of Shimla

According to the official proposal of Smart City Shimla (Urban Development Department, 2017), Retrofitting of 244 Acres is proposed that targets improving citywide pedestrian and vehicular mobility on the circular road, underground ducting and parking. Additional features in the proposal include the development of an ice-skating rink, Stormwater security and management of spring water. Under the proposal, Redevelopment plans are made to develop 48 Acres of lower bazaar, Gunj & Krishna Nagar. Also, the proposal aims to replace its dilapidated and unsafe buildings with new, resilient, modern, and earth-quake resilient buildings.

The Pan city proposal of Shimla aims to create a comprehensive facility that aggregates all ICT enabled services to integrate information across various sectors for optimal utilization of assets. It constitutes the following components:

- **Central Command and Control Center:** Developed for real-time data analysis and information dissemination.
- **Intelligent Traffic Management System (ITS):** entails three interrelated processes: data sensing technology, data analytics, and data communication. It also includes a CCTV surveillance system and Smart bus stops.
- **Landslide and fire detection sensors:** A robust monitoring and response system to enable resiliency.
- **Remote Health Tracking System:** For Critically ill elders.

- **Fiber to home:** for efficient access to data.
- **Common Website:** Central source for information dissemination.
- **GIS Map Development**
- **Public Wi-Fi**
- **SCADA system and Smart metering**
- **Website for tourist and branding**

3.3.2 Smart City Proposal of Dharamshala

According to the official document (Government of India, 2017), Dharamshala Smart City Proposal aims to develop 775 acres under both redevelopment & retrofit components. It includes Dharamkot, Bhagsu, McLeodganj, Kotwali Bazar, Khajanchi Mohalla, Kachahri Adda, Ramnagar, Shyamnagar, Cheelgari. Retrofitting Strategy in the remaining area will enhance the area's livability by providing sustainable and Smart infrastructure for resource optimization, reducing energy and water footprint, minimizing environmental impact, developing integrated green and blue corridors, public space networks and inclusive street designs. It aims to enhance walkability and provide safe and vibrant urban culture.

Pan City Proposal of Dharamshala Smart City Project envisions transformation into optimized use of city systems – transport and utilities, and participatory urban governance. By institutionalizing their information systems with a City Coordination Center (called DCube) for Developing Digital Dharmshala.

- **DCube:** Similar to Living Labs, DCube is a 24*7 information center for users – residents, tourists, city managers and policymakers to strengthen real-time data access for evidence-based planning and decision making. DCube is the “nerve center” of city functions; the center is also helpful in aligning the city

vision and strategic focus with global sustainable goals. Also, It leads to data revolution through:

- **Smart Multi-Model Mobility Systems:** the system will provide seamless connectivity, urban safety, tourism development, intelligent traffic management, passenger information system and Travel Planner service.
- **Environmentally Sustainable & Disaster Resilient City:** Enabling ICT Based, effective warning and emergency responses, using robust hazard risk assessment tools and disaster response strategies.
- **ICT Enabled Doorstep Governance:** 24*7 City Observatory – a robust digital platform & command center linking G2G, G2B and G2C systems, including Smart card, inter-department coordination, and citizen services.

4. Tourism Challenges in Himachal

Environmental and geographical conditions impose threats to tourism in the state (Kuldeep & Virender, 2019). Himachal is unable to tap its full potential in Tourism (Rajpurohit et al., 2015; Rishi & Giridhar, 2007). Himachal is a steep Himalayan territory and a relatively new state with not many industries and much wealth. Despite Challenges (Figure 2), the state strives for more remarkable development and comes under the Top ranks in various sustainable development goals (Government of Himachal Pradesh, 2020). The Himachal government gives due priority to the development of tourism. In Himachal, Tourism largely contributes to Employment generation. A trend from 2003 to 2016 shows the contribution of tourism to employment has increased from 2.66% to 12.66% (Kuldeep & Virender, 2019). Despite significant contributions to the state economy, Himachal is still lacking to tap its full potential in Tourism.

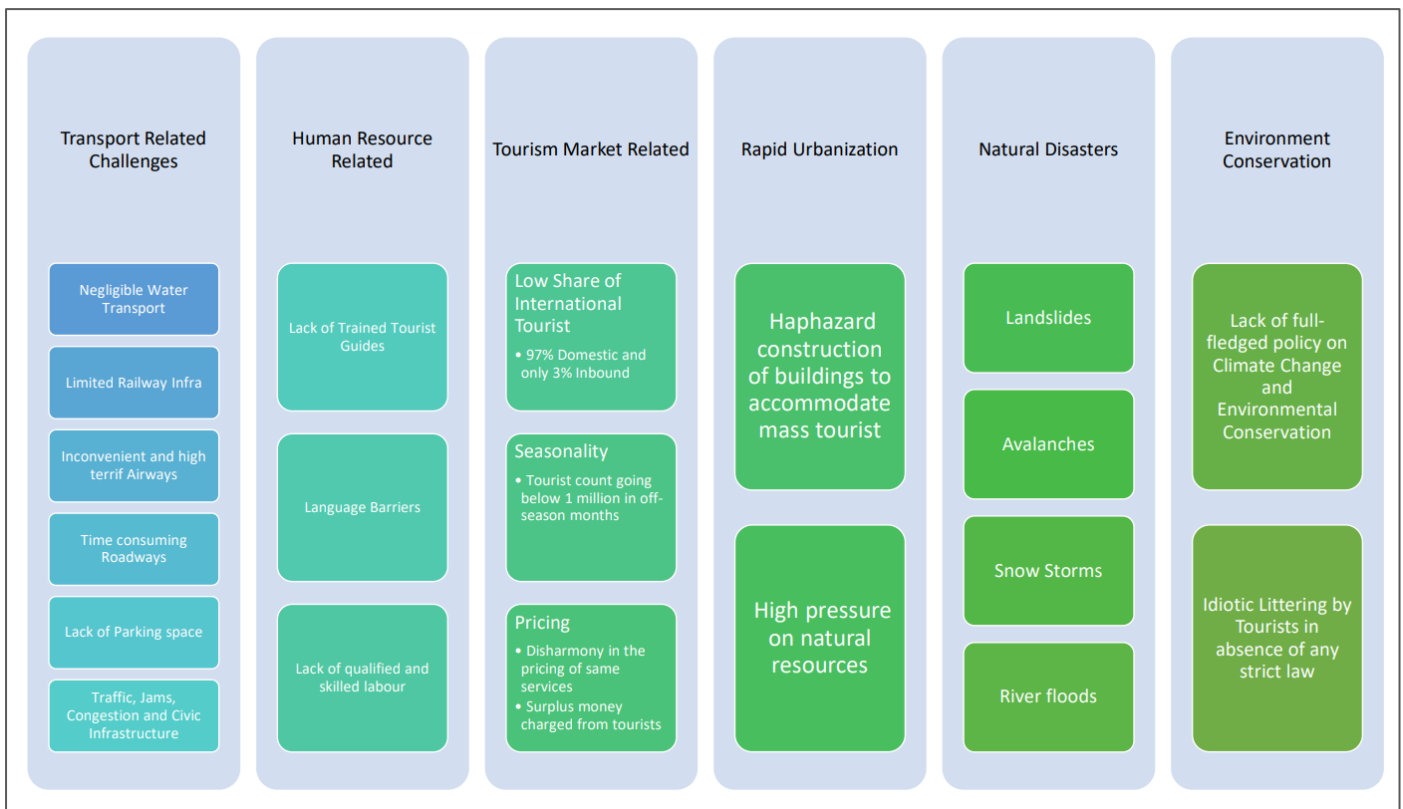


Figure 2. The diagram shows the most common tourism-related challenges in Himachal Pradesh

4.1 Transport Related Challenges

Himachal is not capable of attracting high-end tourists (Parmar, 2012). Transportation is a fundamental component of any Tourism system. People need a good transportation system to visit tourist destinations. If there is a lack of proper transportation (Kuldeep & Virender, 2019; Rajpurohit et al., 2015), Tourist destinations will lack some segment of Tourists. Like a high-end tourist who avoids travelling through inconvenient mediums. So, destinations with weak transport lose potential/high-end visitors.

4.1.1 Waterways

Water Transport is negligible in Himachal Pradesh (Chetan Sharma, 2019); according to Economic Survey 2020-21: Chamera, Koldam and Govind Sagar Lake are being developed for Cargo & Passenger Transport (Government of Himachal Pradesh, 2020). All these areas are located in the lower regions of Himachal, and the upper regions are out of scope for the development of water

transport due to their steep terrain. So, from the overall perspective of Himachal, even after the development of waterways in identified lower regions, water transport will still cater to minimal population and area.

4.1.2 Railways

Rail Transport in the state is also held negligible (Chandra & Neelima, 2013; Chetan Sharma, 2019; Gupta, 2015; Kuldeep & Virender, 2019), Himachal has only two narrow gauge railway lines that connect Shimla to Kalka (96 Kms) and Jogindernagar to Pathankot (113 Kms), and there is one broad gauge railway line (33 Kms) that runs in Una district (Government of Himachal Pradesh, 2020). Again, these are lower regions of Himachal, and there is no railway in the upper regions. However, there is emerging hope in the upper regions from the “Bilaspur-Manali-Leh” railway line, which might give wings to transport in this region (Banerjee, 2022).

4.1.3 Airways

Air Transport is also considered negligible in the state (Chandra & Neelima, 2013; Gupta, 2015; Kuldeep & Virender, 2019). There are only three airports in Himachal: Jubbarhatti (Shimla), Gaggal (Kangra) and Bhunter (Kullu). Tourists rarely use Himachal's airports due to high tariffs, inconvenient routes and schedules (Chandra & Neelima, 2013). There is a need for a proper research study on Air Transport in Himachal that would help improve its operations.

One new Greenfield international airport is under a process that would come up at Nagchala in Mandi District (Government of Himachal Pradesh, 2020). In Jan 2020, the Himachal Government & Airport Authority of India (AAI) signed an MoU, which decided ownership parity as 49% and 51%, respectively (Bureau, 2020). The government has selected the Balh region of district Mandi for airport construction. The Balh region is considered the most fertile land. So, the locals in this area, whose residential, agricultural and commercial land falls in Balh, are against its construction (Manta, 2020). As this airport will be the first International Airport in Himachal, it will surely give wings to tourism, but the challenge related to its construction has to be tackled sustainably.

4.1.4 Roadways

Only Roads are the most suitable medium to travel in Himachal Pradesh, which causes increased travel time and costs. The condition of roads in the majority of the areas is not good. It is seen that majority of tourists complain about the roads in Himachal. The Roadways infrastructure in the state requires improvement (Chandra & Neelima, 2013; Chetan Sharma, 2019; Kuldeep & Virender, 2019; Rajpurohit et al., 2015; Rishi & Giridhar, 2007). No Doubt road widening of the Manali National Highway is a great initiative, and commendable work has been done on this road (The Tribune, 2021). There are still many areas in Himachal that require proper road connectivity, which is crucial for tourism development at new destinations.

4.1.5 Parking

Lack of Parking spaces is a big issue in all three (Shimla, Manali, and Dharamshala) most popular tourist destinations of Himachal, which hits both Tourists & locals (Gupta, 2015). During season 5,00,000 vehicles come to Manali, but there is parking

space for only 400 vehicles (Singh, 2008). Too many tourist vehicles and no parking space show how difficult it becomes during the season and its severe impact on the local community's life.

4.1.6 Traffic Jams, Congestion and Civic Infrastructure

During peak season, Tourists & locals have to face many problems associated with traffic jams (Chandra & Neelima, 2013). An excessive amount of tourist footfall in season makes this place overwhelming, creating problems for locals in their quality of life and threatening the civic infrastructure (Gupta, 2015; Singh, 2008). So, innovative solutions are required in the management of these challenges.

4.2 Human Resource Related

Several research studies on Himachal Pradesh's Tourism have highlighted the issue related to guidance and Language (Rajpurohit et al., 2015), lack of trained tourist guides (Gupta, 2015) and "shortage of trained, qualified and skilled labour" (Kuldeep & Virender, 2019). Therefore, guide training and professional training are required in the state.

4.3 Low Share of International Tourists

It has been observed that, on average, the inflow of tourists is increasing every year in Himachal (Chetan Sharma, 2019; Parmar, 2012). However, the gap between Domestic and International Tourist Arrivals seems huge (Figure 3). As visible in the figure, the number of foreign tourist arrivals has stayed steady over the decade as there is no significant upward or downward trend in arrivals. The highest ever International Tourist seen is 0.5 Million. A study by IIT Mandi (Rajpurohit et al., 2015) says that the "share of foreign tourist as compared to the domestic tourist is extremely low in Himachal (97% Domestic and only 3% Foreign).

In contrast, the scenario of Domestic Arrivals is very different; there has been an overall upward trend over the last decade. However, this upward trend is not steady as we can see in the graph that 2013 and 2018 had a fall in tourist arrivals. These fluctuations can be due to heavy rains, floods, and snowfall in the state (Kuldeep & Virender, 2019) and due to elections or political instabilities.

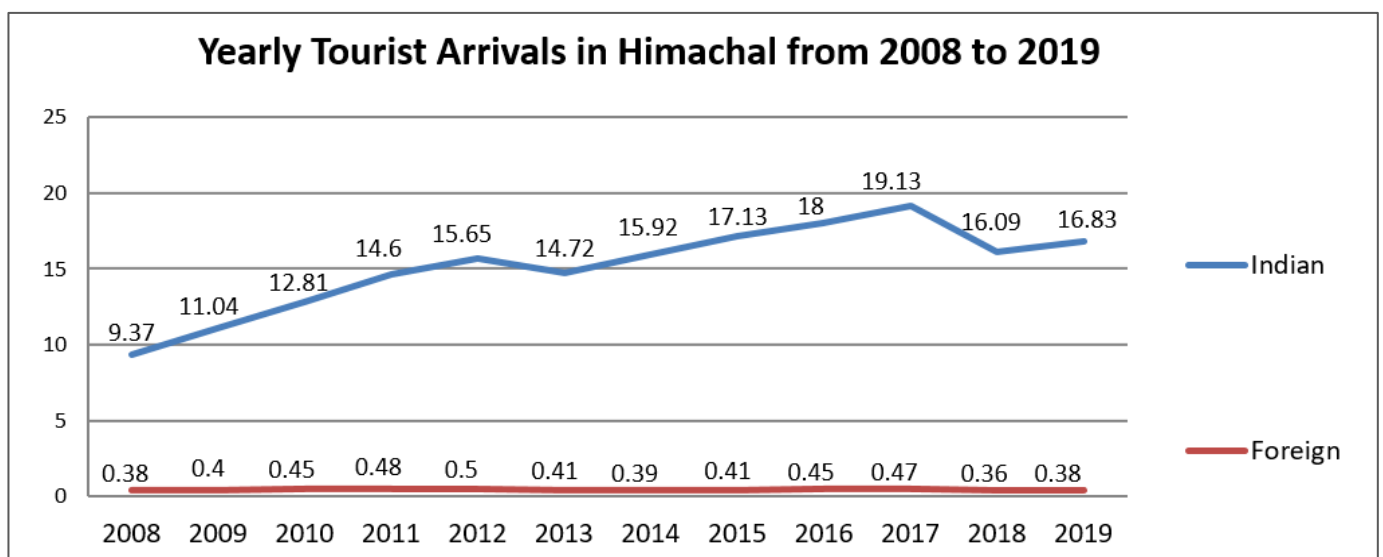


Figure 3. Shows the total number of Domestic and Foreign Tourist arrivals in millions (2008 to 2019).

Source: Data for this graph is taken from Official Statistics released by Himachal Tourism.

4.4 Seasonality

To show seasonality, we analyzed the tourist arrivals data from 2008 to 2019. First, we calculated the average number of tourists in each month based on the data from 2008 to 2019. Finally, the graph (Figure 4) has been plotted using the results. It is clearly visible in the figure that April, May and June are the highly populated months with tourist arrivals. Thus, April-May-

June can be called the peak season. Then we see a decreased flow of tourists in the months of July, August and September. October is the month in the latter year when tourists' arrival increases for some time. Finally, the months from November to March can be called off-season, where tourist footfall decreases below 1 million. While in the peak season, the tourist footfall is around 1.7 million every year, the off-season causes about 0.8-0.9 million shortfalls in tourists.

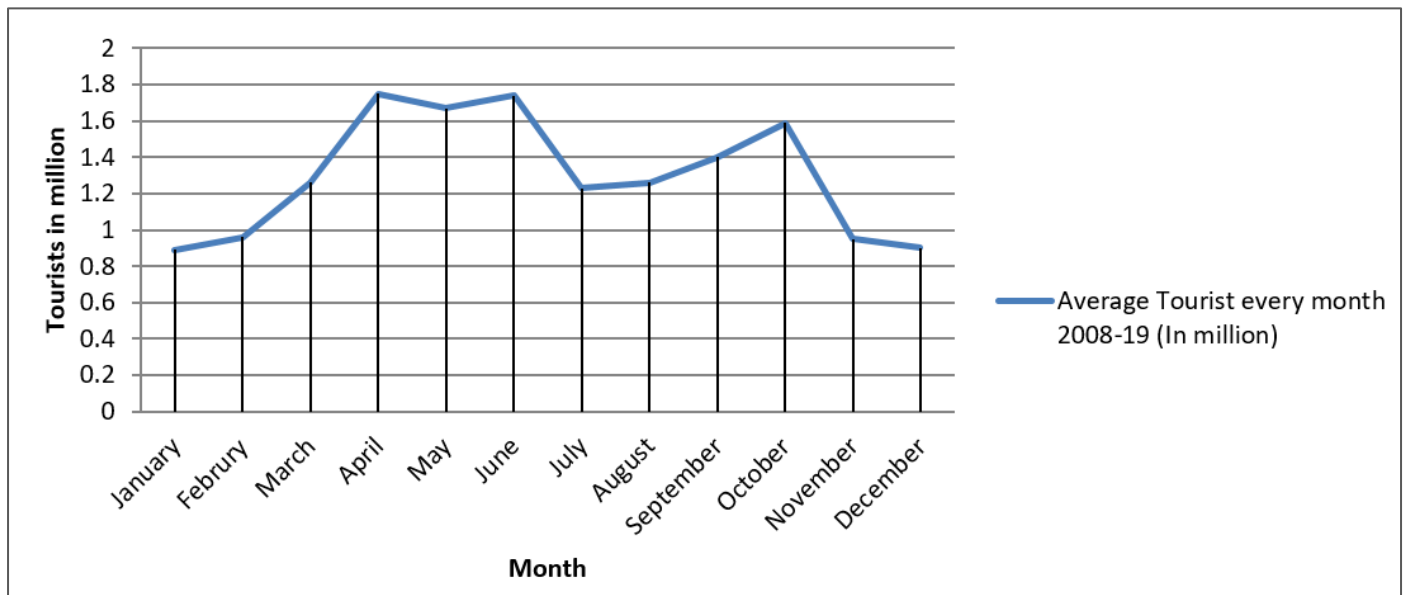


Figure 4. A graph showing month wise average tourist arrivals from 2008 to 2019 in Himachal Pradesh.

Data Source: Data for this graph is taken from Official Statistics released by Himachal Tourism

On average, Himachal Pradesh sees 1.3 million (13 Lac) tourists each month in a particular year. So, 1.3 million is a good number of tourists that must be managed properly for the state's overall socio-economic and environmental prosperity.

4.5 Pricing

Due to high fluctuations caused by seasonality, the demand and supply get affected, so the tourism industry struggles with non-standard pricing. The disharmony in the pricing system causes problems for tourists and for businesses to compete in a healthy manner. In Himachal, many tourists have reported high charges applied to them, compared to locals (Gupta, 2015). Bargaining and surplus charges are a big problem in the tourism industry of Himachal. Foreign tourists are highly vulnerable to surplus charges as they have no idea about tourist attractions and no other place to go to the travel agents (Rajpurohit et al., 2015).

4.6 Rapid Urbanization

In Himachal, tourism development has pushed for the haphazard construction of buildings (hotels), resulting in building concrete jungles that have created disharmony with nature and have spoiled its natural essence (Chandra & Neelima, 2013; Gupta, 2015). Similarly, rapid unplanned urbanization has created problems in Manali, challenging its civic infrastructure (Singh, 2008). Tourism induced urbanization related issues are tourism generated threats to the local community and the natural environment.

4.7 Natural Disasters

The natural beauty of the Himalayas is the main USP (Unique Selling Proposition) that attracts millions of tourists every year.

However, the same natural beauty can be a deterrent to tourist arrival. Due to the rough terrain and natural fragility, the state is always prone to disasters, and the situation becomes worse in bad weather. During the monsoon season of 2021, several videos of landslides on the main highway of Kinnaur, Sirmour and other areas went viral on social media (Sehgal, 2021). These incidents resulted in the death of several people.

Natural disasters are not just limited to landslides. We hear news of people trapped in snowstorms, deaths on trekking trails, and people drowned in rivers. The state's natural wonders are very contrasting and close to mainland India. The natural environment offered by Himachal becomes very risky at times in some areas. Therefore, efficient and effective management of disasters in a proactive manner is needed.

4.8 Environment Conservation

Himachal has started several mini initiatives towards environment conservation such as the buyback plastic initiative, state knowledge cell on climate change, environment leadership award, setting up of ecovillages, and others (Government of Himachal Pradesh, 2020). However, the state government lacks a full-fledged policy on climate change and environmental conservation. There is a need for a significant policy on environment conservation with explicit emission reduction targets, forestation goals and strict laws on littering.

Most tourists visiting Himachal have poor moral and civic senses, and they have become a threat to the local community and the overall environment (Timesofindia.com, 2020). Tourists visiting Himachal in the absence of any strict law on littering keep throwing plastic bottles, rappers and liquor bottles here and there every day.

5. Opportunities as a Smart Tourism Destination

As discussed above, Himachal has many infrastructural-related problems, and it is not yet feasible to develop it to the best standard. Due to extreme costs associated with these tasks. It is not yet feasible to build world-class roads, world-class trains, and better international air connectivity. However, the costs associated with Smart infrastructure are comparatively cheap. Himachal, at least for now, can invest in the Smart Infrastructure. Himachal as an aspiring Smart Tourism Destination shall focus on enhancing the Tourist experience, easing local community life, and contributing to Environment conservation. There are various future opportunities to tackle present challenges and develop Himachal as a Smart Destination (Figure 5).

According to previous studies, the tourists believed that Himachal could become one of the best tourism destinations in the world if it overcomes its deficiencies and market and positions itself as a unique destination in the minds of tourists (Kuldeep & Virender, 2019; Rishi & Giridhar, 2007). Therefore, Himachal should develop itself as an STD that the world shall see as a pioneer in this field. If Himachal makes its niche as a pioneer Smart Tourist Destination (STD), indeed a new unique selling proposition (USP) for Himachal will emerge. Indeed, the new modern USP will attract more Foreign Tourists to the state, even from countries with similar geographic conditions. Thus, new arrivals will increase the share of foreign tourists in the state.

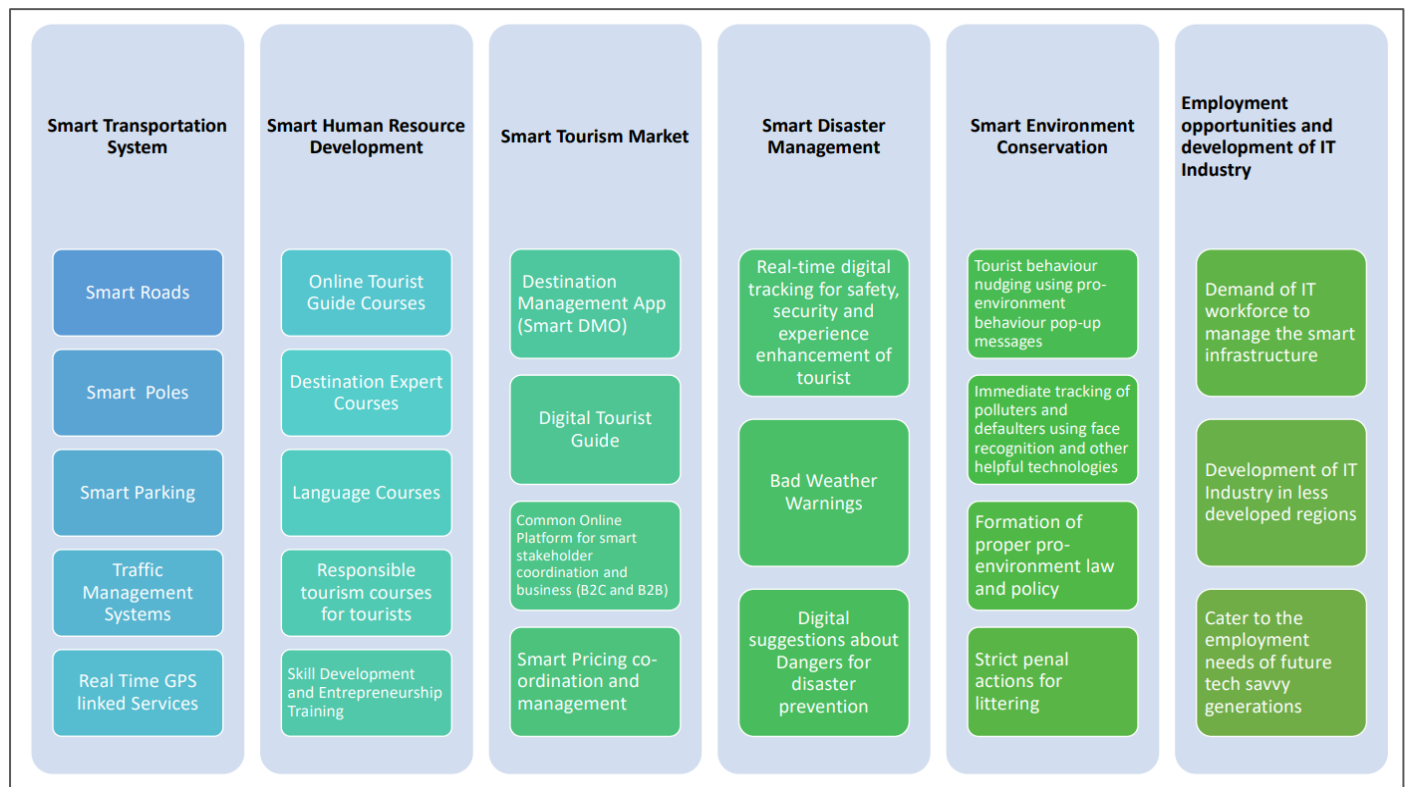


Figure 5. The picture shows future opportunities to tackle present challenges as Smart Tourism Destination

5.1 Smart Transportation Solutions

In 2015, the Indian Institute of Technology (IIT) Mandi published a research report that studied the transportation system in Himachal Pradesh (Rajpurohit et al., 2015). This project aimed to study the feasibility of “Technological Innovation” in improving the experience of tourists & tour operators. Their core suggestion was that Himachal Tourism should develop a digital app. The app features could allow “fare sharing” among anonymous tourists on transport, on accommodation, and on adventure activities. Also, the app must have a “panic button” that will immediately send the location of tourists in any threatening situations. Furthermore, they called upon to make a “Smart card” feature so that tourists will pay one time and enjoy unlimited rides in government vehicles for purchased time. However, these features are still limited much more can be added such as big data tech, tourist tracking, e-commerce, navigation and so on, if such an app will be brought into existence.

5.1.1 Smart Roads

Smart roads make driving safer, more accessible and smooth. Smart Roads uses Internet of Things (IoT) devices to make driving safer, more efficient, and in line with government objectives,

greener roads (vrioeurope, 2021). Smart roads are embedded with sensors that generate data. The central information system analyses that data for Smart traffic management. Real-time information on traffic using online mediums enhances the quality of life for its residents. The meaning of Smart Roads is not just limited to tech infra but also has an indispensable role in renewable energy and a green environment. So, smart roads support electric mobility transition and solar energy. Smart Roads have separate lanes for bicycles and pedestrians, rainwater drainage and ducted transmission lines/cables.

5.1.2 Smart Poles

Smart Poles have an intelligent lighting system that contains sensors. The sensors adjust lighting depending upon the movement of people or vehicles under its range. A full-fledged SMART POLE contains a weather station, air quality sensors, emergency buttons, surveillance cameras, Wi-Fi transmitter, charging slot for electric vehicles/mobiles, a digital city guide, digital advertisement board, loudspeaker for public announcements, and traffic lights (Figure 6). All these functions are integrated on a single pole. Also, it is possible to customize the functions of the Smart pole and design the pole according to particular needs.

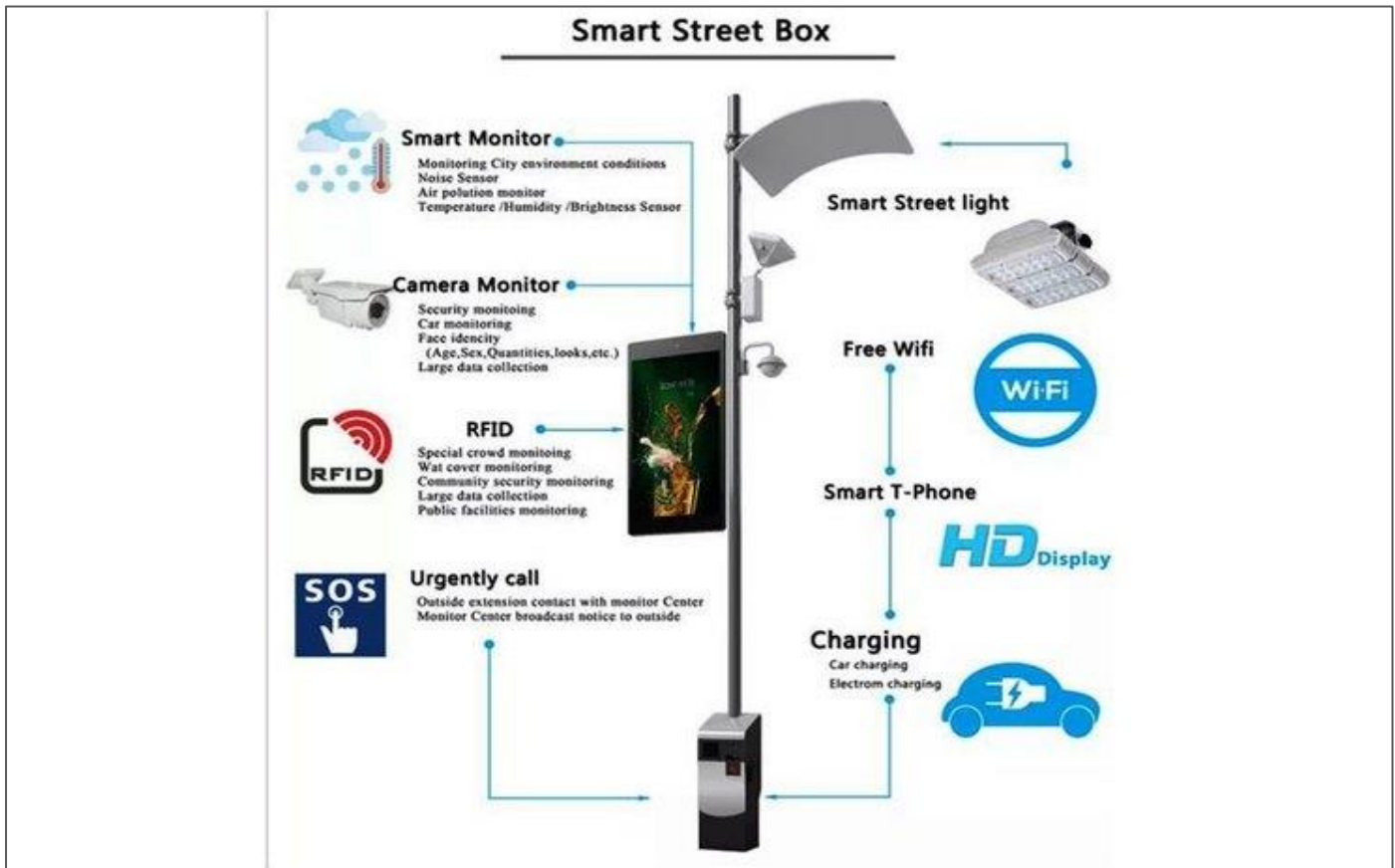


Figure 6. A picture depicting full-featured Smart Pole. (Source: www.Indiamart.com/)

5.1.3 Smart Parking

Smart Parking uses internet technology to provide real-time information on empty parking spaces, automatic fare collection system, number plate detection sensors, and other Smart features which reduce the hassle of parking. A large part of the local population is dependent upon the transportation system and tourism for employment (Rajpurohit et al., 2015). A smart transportation system is not just a need of the tourism industry; it will have an immense impact on residents' quality of life too.

5.2 Smart Human Resource Development

A study on Tourism suggested that Himachal Tourism needs to promote Tourism Certification practices (Parmar, 2012). In Himachal, people do not prefer online systems due to a lack of knowledge and internet phobia (Chetan Sharma, 2019). Online education is prevalent today. They provide an opportunity for learners to learn at their own pace and comfort. Himachal Pradesh, as a Tourism destination, has to bring professionalism in its conduct of Tourism. Online learning is considered the most convenient approach to learning today. The Ministry of Tourism, India, and the Indian Institute of Tourism and Travel Management has developed online guide training courses (IITF, 2021). Similarly, Himachal Pradesh can develop its own state-specific online tourism courses on guide training, destination expert course and new entrepreneur courses. Furthermore, through online certification, every service provider shall be counselled for sustainable environmental practices (Parmar, 2012). Himachal can provide online courses also to tourists. Through these courses, tourists could be taught about the history, culture, and core values of Himachal Pradesh. The behavior of tourists can be nudged towards responsible and sustainable tourism practices (Parmar, 2012). Furthermore, courses can be developed for the local community to make them learn about tourism, its benefits, and its challenges.

5.3 Smart Tourism Market

Hypothetically a common online platform can be imagined as similar to a destination app. It is a state-run digital infrastructure of the tourism market at the destination. A common online platform can have socialistic goals such as the promotion of local businesses by offering them an affordable medium to launch a business online. The platform also has a role in the enhancement of tourist experience through online guidance, authentic e-commerce experience, and real-time connectivity with the tourists. A Common Online platform where all stakeholders of the destination are integrated contributes toward better stakeholder coordination. All factors of the destination's common online platform, which must be run by DMOs have to cater to the needs of various stakeholders such as Tourists, Industry, the Local community and the government. Better management and coordination using digital mediums could enhance the competitiveness level of a tourism destination. Furthermore, a common online platform can help in better pricing management, seasonality and increasing the share of inbound tourists.

5.4 Smart Disaster Management

The safety and security of the visitors/tourists are critical concerns in the tourism development of Himachal (Kuldeep & Virender, 2019). The tourism planners in Himachal need to moderate the level of risk through appropriate means to satisfy tourists' motivations (Parmar, 2012). If the destination has STD online system, tourists can be tracked for their safety and security. In case of an emergency, a tourist's location can be tracked immediately. Possible if the destination is connected with tourists through a common online platform. Tourists can be educated about bad weather warnings, disaster prevention and management, and warned about dangers.

5.5 Smart Environment Conservation

Environmental Sustainability is a crucial issue in Himachal Pradesh (Kuldeep & Virender, 2019). Tourists visit this destination mainly for the natural environment; thus, spoiling has to be prevented. The behavior of tourists and locals towards Environment conservation can be nudged using technology. If tourists are connected with DMOs through an online platform, the DMO can send pop-up messages to tourists to nudge their behavior towards pro-environment conservation. DMOs can offer tourists to sign online/Digital pledges to take an oath that they will not spoil the destination’s environment. Also, defaulters can be tracked immediately in the Smart IoT enabled environment using face recognition technology and tourist tracks. Tourist tracking is adopted by Venice, which has been poorly hit by mass tourism. Also, research studies in Australia validate the use of Tourist tracking technology (Hardy et al., 2017). So, Himachal must pioneer its way in India as an emerging smart tourism destination using the latest Smart technologies.

5.6 Employment Opportunities and Development of the IT Industry

A study conducted on the growth and structure of industries in Himachal Pradesh highlights several issues related to industrial development in the state (Kumar & Pattanaik, 2017). The study says Himachal is unable to provide a suitable environment for the development of industries like the IT Industry. The disparity in industrial growth is another concern raised by this study; the advanced districts (Solan, Una, Sirmaur, Bilaspur, Shimla and Kangra) became more developed in relation to backward districts (Hamirpur, Kullu, Chamba, Lahul & Spiti, and Kinnaur). The disparity is due to location as the advanced districts are closer to big cities such as Chandigarh and Delhi. Due to disparity in

industrial growth and development, the backward districts are completely left behind. If Smart infrastructure is developed in the state for its operations, Himachal will require a workforce related to the IT industry means new employment opportunities. Internet is a commonly available technology, and awareness about its functionality and expertise among locals is lacking (Chetan Sharma, 2019). So, data centers of smart infrastructure can be established in the backward districts which will stimulate the growth of the IT Industry and Tech Savvy culture in these areas.

India’s New Education Policy allows students to learn to program from the sixth class (The quint, 2020). If we try to imagine the impact of this step, definitely our future generations are tech-savvy societies. Indeed, the development of the IT Industry will cater to their needs such as Innovation and Employment.

6. Conclusion

This study acknowledges all tourism-related challenges in mountain tourism locations such as Himachal in the Indian Himalayas based on the available information. The challenges were framed under some common themes related to transport, human resource, the tourism market, rapid urbanization, natural disasters, and environment conservation related. Alleviation of these challenges is possible to some extent using the smart infrastructure. If tourism development in the state is taken towards making a Smart destination can result in various benefits to the community, tourists and the government as well. The smart city projects at the destination are the added benefits because they are the building blocks of a Smart Tourism Destination. The link between present challenges, smart cities and future smart destination is shown using (Figure 7).

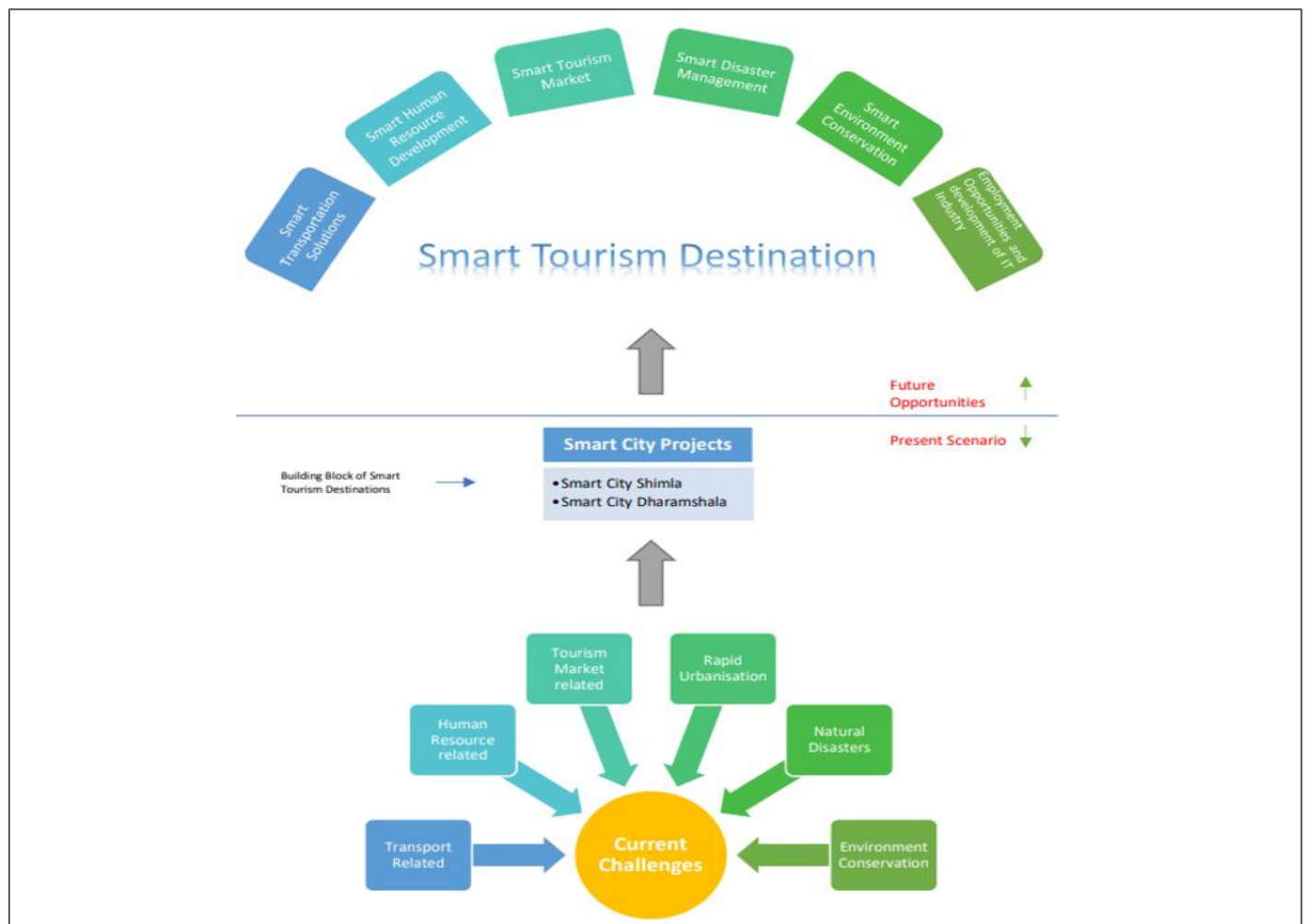


Figure 7. Conceptual Map showing the way forward for Himachal as a Smart Tourism Destination

Himachal Pradesh is a top-rated tourism destination in India. The state is unable to achieve its full potential in Tourism. Himachal faces many development-related challenges as the state is located in the steep hilly terrains of the western Himalayas. Also, comparatively, Himachal is a small state in India that has a limited economy and wealth. The development of World-class infrastructure may not be feasible today as it is extremely expensive. Therefore, opportunities related to Smart tourism destination has been shown. Smart infrastructure development is less costly than other options such as world-class roads, trains, and flights. Smart infrastructure has benefits for locals, tourists, and local businesses. Government investment in Smart Infrastructure development has many socio-economic benefits. It is solving the most challenging issues in tourism smartly, new employment is generated, tourists' satisfaction is increasing, and the ease of living is raised for residents. As the Smart Tourism Destinations concept is emerging, Himachal is the right time to make its name as an emerging pioneer of Smart tourism destinations and gain free publicity worldwide and a new USP. Hence, this paper suggests that the government look up to these opportunities and support research & development in this area.

Declaration of competing interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ORCID iD

Sahil Sharma  <https://orcid.org/0000-0001-6946-2025>

References

- Banerjee, P. (2022, May 6). *India overtakes China as Bilaspur-Manali-Leh rail line will soon become the world's highest*. Traveltrange.Com. <https://traveltriangle.com/blog/bilaspur-manali-leh-rail-line/>
- Boes, K., Buhalis, D., & Inversini, A. (2015). Conceptualising smart tourism destination dimensions. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 391-403). Cham: Springer
- Boes, K., Buhalis, D., & Inversini, A. (2016). Smart tourism destinations: Ecosystems for tourism destination competitiveness. *International Journal of Tourism Cities*, 2(2), 108-124.
- Buhalis, D., & Amaranggana, A. (2013). Smart tourism destinations. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 553-564). Cham: Springer.
- Bureau, T. (2020, January 21). *AAI signed an MoU with Government of Himachal Pradesh for a Greenfield Airport at Nagchala, Himachal Pradesh*. Todaystraveller.Net. <https://www.todaystraveller.net/aii-signed-an-mou-with-government-of-himachal-pradesh-for-a-greenfield-airport-at-nagchala-himachal-pradesh/>
- Cavalheiro, M. B., Joia, L. A., & Cavalheiro, G. MdC. (2020). Towards a smart tourism destination development model: Promoting environmental, economic, socio-cultural and political values. *Tourism Planning and Development*, 17(3), 237-259.
- Chahal, A. S., & Kaushal, S. (2017). Smart city Shimla: Citizen friendly initiatives proposed for improving quality of life. *ACM International Conference Proceeding Series, F1280*, 568-569.
- Chandra, M., & Neelima, G. (2013). The marketing and branding of Himachal Pradesh as a tourist destination- Concept and issues. In P. N. R. T. M. Sawant (Ed.), *Contemporary tourism planning: Introspecting problems and prospects* (1st ed.). Excel India Publishers.
- Chetan Sharma, S. S. (2019). Influence and impact of information technology on Himachal Pradesh tourism. *Journal of E-Commerce for Future & Trends*, 6(1), 52-59.
- Cohen, B. (2018, May 1). *Blockchain cities and the smart cities wheel*. <https://boydcohen.medium.com/blockchain-cities-and-the-smart-cities-wheel-9f65c2f32c36>
- GOI. (2021). *About smart cities mission*. Retrieved October 25, 2021, from <https://smartcities.gov.in/about-the-mission>
- Government of Himachal Pradesh. (2020). *Economic Survey 2020-21*. Government of Himachal Pradesh. <https://himachalservices.nic.in/economics/en-IN/economic-survey.html>
- Government of India. (2017). *The Smart City Challenge-Stage 2: Smart City Proposal-Dharamshala*. Ministry of Urban Development, Government of India. <https://smartnet.niua.org/content/b1103932-b7e8-45a8-96af-e34ed7db6a0c>
- Gupta, J. (2015). Tourism in Himachal Pradesh: A study of Kullu Manali. *International Journal of Engineering Research & Management Technology*, 2(3), 183-191.
- Hardy, A., Hyslop, S., Booth, K., Robards, B., Aryal, J., Gretzel, U., & Eccleston, R. (2017). Tracking tourists' travel with smartphone-based GPS technology: A methodological discussion. *Information Technology and Tourism*, 17(3), 255-274.
- ibef.org. (2021). *About Himachal Pradesh: Information on tourism, industries, geography*. Retrieved March 3, 2021, from <https://www.ibef.org/states/himachal-pradesh.aspx>
- IITF. (2021). *Incredible India tourist facilitator (IITF) certification programme*. Retrieved November 4, 2021, from <https://iitf.gov.in/>
- Kuldeep, K. A., & Virender, K. (2019). Growth and development: A study of tourism industry of Himachal Pradesh. *Confluence of Knowledge*, 7(1), 46-53.
- Kumar, S., & Pattanaik, F. (2017). Growth and structure of industrial sector in Himachal Pradesh. *Journal of Regional Development and Planning*, 6(1), 33-44.
- Lai, O. (2021). *Top 7 smart cities in the world*. Retrieved October 14, 2021, from <https://earth.org/top-7-smart-cities-in-the-world/>
- Manta, D. (2021, October 18). *Mandi bypoll: Voters sharply divided over Nagchala airport project*. The Tribune India.
- Ministry of Urban Development. (2015). *Smart cities: Mission statement and guidelines*. Government of India. <https://smartcities.gov.in/guide-lines>
- Padmanabhan, V. (2021, October). *Can urban living labs address India's urban planning challenges?* Oxford Policy Management. <https://www.opml.co.uk/blog/can-urban-living-labs-address-india-urban-planning-challenges>
- Parmar, J. S. (2012). Tourism development in Himachal Pradesh: Emerging dimensions. *International Journal of Hospitality & Tourism Systems*, 5(1), 66-76.
- QuestionPro. (2021). *Conceptual research: Definition, framework, example and advantages*. Retrieved April 16, 2022, from <https://www.questionpro.com/blog/conceptual-research/>
- Rajpurohit, B. S., Milan, G., Gautam, A. K., Jain, Y., Cherukuri, S., Meena, K., & Badwan, A. (2015). *Problems and prospects of tourism in Himachal Pradesh*. https://www.iitmandi.ac.in/ISTP/projects/2015/Problems_Tourism_Himachal_Pradesh_9.html
- Ratti, C. (2018, March 10). *Conversation on smart cities*. YouTube. <https://youtu.be/QTtahe6Qgbo>
- Rishi, S., & Giridhar, B. S. (2007). *Himachal tourism: A swot analysis*. International Marketing Conference on Marketing & Society. <http://hdl.handle.net/2259/621>
- Sehgal, M. (2021, July 30). *Terrifying video captures landslide in Himachal Pradesh's Sirmour, stretch of road caves in*. India Today. <https://www.indiatoday.in/india/himachal-pradesh/story/video-landslide-himachal-sirmour-road-caves-watch-rescue-1834693-2021-07-30>
- Singh, S. (2008). Destination development dilemma — Case of Manali in Himachal Himalaya. *Tourism Management*, 29(6), 1152-1156.
- The quint. (2020, July 30). *Class 6th students can learn coding as per new education policy*. <https://www.thequint.com/news/india/new-education-policy-students-to-learn-coding-from-class-6th-onwards>
- The Tribune. (2020, October 18). *Mandi bypoll: Voters sharply divided over Nagchala airport project*. <https://www.tribuneindia.com/news/himachal/mandi-bypoll-voters-sharply-divided-over-nagchala-airport-project-326315>
- Timesofindia.com. (2020, September 23). *Tourists littering, flouting safety norms worries locals as Himachal Pradesh opens for tourism*. Times Travel. <https://timesofindia.indiatimes.com/travel/travel-news/tourists-littering-flouting-safety-norms-worries-locals-as-himachal-pradesh-opens-for-tourism/as78274162.cms>
- Urban Development Department. (2017). *Shimla Smart City Proposals*. Ministry of Urban Development, Government of India. <http://ud.hp.gov.in/schemes-projects-smart-city-mission-proposals-for-smart-cities/shimla-smart-city-proposals>
- vrioneer. (2021). *Smart road technology: Digital highways of the future*. Retrieved November, 4, 2021, from <https://vrioneer.com/en/smart-road-technology-digital-highways-of-the-future/>
- Xin, S., Tribe, J., & Chambers, D. (2013). Conceptual research in tourism. *Annals of Tourism Research*, 41, 66-88.

Author Biography

Sahil Sharma is currently a PhD Candidate in the subject of Tourism at the Himachal Pradesh University, Shimla, India. His research area for PhD dissertation focuses on Data Science and Tourism Research. He is also interested in topics like Smart Tourism, Marketing, and Destination Management. He has been awarded the Junior Research Fellowship (JRF) to pursue PhD by the University Grants Commission (UGC) of India. Previously his education has been a Master of Business Administration (MBA) in Tourism Management from the Indian Institute of Tourism and Travel Management (IITTM), Gwalior and a Bachelor of Arts (BA) in Tourism Administration from the Government Degree College (GDC), Kullu.