



A Destination Specific Analysis of Tourism Infrastructure in Kashmir Valley in the Course of Application of Composite Index Methodology

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Keywords:

Infrastructure,
Destination
specific,
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Comparative
analysis.

Abstract.

The paper is empirical in the course of methodological contributions and policy implications. It studies the quantity of tourism infrastructure obtainable for destinations in the Kashmir Valley. For analysis, quantitative data were collected from the head offices of numerous departments facilitating infrastructure facilities. The Union Territory of Jammu and Kashmir is widely famous for its tourism potentials. Nevertheless, it needs to catch up in tourism infrastructure. The low quantity is visible in components and needs a comprehensive measurement to identify lags. Subsequently, identifying the significant areas of weakness required a scientific mechanism and an approach to remove such bottlenecks. Therefore, measurement of Infrastructure based on scientific methods is indispensable to identify the areas of inadequate facilities and to remove obstructions. Subsequently, composite index based analyses were adopted to compare and rank the quantity of Infrastructure of five popular tourism destinations. Tourism Infrastructure Index exposed disparity by dimensions and among the destinations. It is revealed that a low amount of Infrastructure is evident for most destinations and, therefore, affects the development of tourist places. So, the provision of sufficient quantity is recommended and depends upon the geospatial characteristics, nature and necessities of the destinations.

Kata Kunci:

Infrastruktur,
Destinasi spesifik,
Indeks komposit,
Analisis komparatif.

Abstrak.

Makalah ini empiris dalam perjalanan kontribusi metodologis dan implikasi kebijakan. Ini mempelajari jumlah infrastruktur pariwisata yang tersedia untuk tujuan di Lembah Kashmir. Untuk analisis, data kuantitatif dikumpulkan dari kantor pusat berbagai departemen yang memfasilitasi fasilitas infrastruktur. Wilayah Persatuan Jammu dan Kashmir terkenal luas dengan potensi wisatanya. Namun demikian, perlu mengejar infrastruktur pariwisata. Kuantitas rendah terlihat pada komponen dan memerlukan pengukuran komprehensif untuk mengidentifikasi kelambatan. Selanjutnya, mengidentifikasi area kelemahan yang signifikan memerlukan mekanisme ilmiah dan pendekatan untuk menghilangkan kemacetan tersebut. Oleh karena itu, pengukuran Infrastruktur berdasarkan metode ilmiah sangat diperlukan untuk mengidentifikasi area yang tidak memadai fasilitasnya dan menghilangkan penghalang. Selanjutnya, analisis berbasis indeks komposit diadopsi untuk membandingkan dan memberi peringkat kuantitas Infrastruktur dari lima tujuan wisata populer. Indeks Infrastruktur Pariwisata mengungkap disparitas berdasarkan dimensi dan antar destinasi. Terungkap bahwa jumlah Infrastruktur yang rendah terbukti untuk sebagian besar tujuan dan, oleh karena itu, mempengaruhi perkembangan tempat-tempat wisata. Jadi, penyediaan jumlah yang cukup direkomendasikan dan tergantung pada karakteristik geospasial, sifat dan kebutuhan destinasi.

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1. Introduction

For daily operations and economic development, infrastructure facilities are essential. Stronghold and richness in Infrastructure could be noticeable in the quality of service and well-being. It required infrastructure up-gradation and development in various sectors of the economy. The service sector, which is essential to the economy, requires periodic Infrastructure upgrading with modern technologies (Saner, Yiu & Filature, 2015). The industry will benefit from this approach as it increases service competition and improves the perception of the locations (Kaddi & Sukhlaidya, 2014). Tourism is one of the service sectors that has risen to prominence recently and offers both direct and indirect benefits. The Indian government took advantage of this chance to maximize the potential benefits of tourism. In order to draw tourists, tourism locations are promoted on a global scale. An increase in tourist numbers, economic gains, and employment possibilities resulted from efforts. Better Infrastructure is considered vital for uninterrupted functioning and is deeply connected to tourism development (Seetanah & Juwaheer, 2011). Quality infrastructure enables destinations to facilitate a wide range of experiences, qualitative images, and natural protection. Otherwise, it causes visitors' reluctance to see destinations, unhygienic conditions, and other related issues (Rani, Afifudin & Akbar, 2017). Sub-standard establishments didn't serve the purpose and offered negative externalities painstakingly.

Infrastructure problem in one component interrupts the effectiveness of other segments. Hidayat et al. (2017) tested and proved it through inter-linkages of shortage in accommodation and its impact on transport and other destination facilities. Therefore, it is clear that uneven development in the tourism infrastructure creates functional defects in the industry. FICCI (2018) analyzed the infrastructure status in India and identified a trade-off between diversified tourism potentials and a dearth of Infrastructure. State-wise observations confirmed the specified association and their impact on the tourism industry. The need for Infrastructure varies between regions and mainly depends upon geographical specifications. However, it is evident that the types of Infrastructure work jointly and are interdependent for better functioning.

Public utilities, transportation, and hotels are the main drivers of tourism growth, whereas water sanitation, drainage, and solid waste treatment plants are crucial for protecting tourism resources. The functioning of the tourism industry depends not only on typical basic Infrastructure but also on other facilities. Public utilities provide a helping hand, while soft Infrastructure is mandatory to serve visitors' needs. Similarly, providing sports-related items, entertainment, and security establishments is highly needed to amaze tourists and ensure their safety and security. India is diversified in potential tourism states and unique in geography. However, it lags behind other countries in Infrastructure and other establishments. Most states significantly depend on the tourism industry; however, growth needs to be improved by adequate facilities (FICCI, 2018, pp. 10-19). To promote Infrastructure, the Central Ministry has taken initiatives and the same plan promulgated by states of the country. Deficiencies of tourism infrastructure vary among the states and therefore ask for independent exploration and measurements for policy analysis. Measurements based on scientific approaches are widely helpful in quantifying available facilities and rectifying infrastructure bottlenecks.

The Union Territory of Jammu and Kashmir is widely famous for tourism potential and hospitality. Nevertheless, it lags in tourism infrastructure and is more vulnerable to sustainability concerns (Ease of Living Index, 2018; Aslam et al., 2018, p.1102). The low status could be observed in components of Infrastructure, but a comprehensive measurement regarding tourism infrastructure has yet to be provided. So, identifying the significant areas of weakness required a scientific mechanism and an approach to remove such bottlenecks. Therefore, the measurement of Infrastructure based on the composite Index method is relevant to identify the areas of inadequate facilities and removing bottlenecks accordingly. Against this backdrop, an analysis of the quantum of tourism infrastructure through a composite index is obligatory to compare the destinations in Kashmir Valley, India.

2. Literature Review

Studies categorically focusing on the quantum of Infrastructure and their measurement are critically reviewed and presented in this study. The tourism industry is sensitive and highly influenced by infrastructure facilities (Seetannah et al., 2011). Accordingly, infrastructure augmentation based on destinations' competitiveness and tourists' expectations is vital for industry expansion (Knežević Cvelbar et al., 2016; Sonja & Ivana, 2016). The augmentation range may vary among destinations by nature and tourism type, but studies found a strong link between the quantity of infrastructure and tourism development (Mandić, Željko & Željko, 2018). Thus, a shortage in quantity directly affects the functioning and adversely influences tourist satisfaction. In addition to infrastructure inadequacy, lack of maintenance and technological updates worsens functional abilities and creates sustainability issues (Melo, Kamal & Anais, 2016). Effective augmentation and maintenance are advised as policy suggestions to improve performance.

Studies assessed the shortfall and conveyed the dearth of critical Infrastructure, public utilities and solid waste management, and suggested remedies (Parsons, 2009; Cuka, Slawomir & Tomas, 2015). On the other hand, at the global level, indices are constructed to measure the infrastructure gap. The primary goal is to picture the status and the links between Infrastructure and economic development (Donaubauer, Meyer, & Peter, 2014; Sahminan, Hermansyah & Robbi, 2019). In addition, few studies analyzed the influence of Infrastructure on economic and social indicators (Rehman & Noman, 2020).

Similarly, tourism studies also did the index-based measurement in connection with the performance of indicators and their influence on tourist influx, competitiveness and development (Martin, Mendoza1 & Roman, 2015). Other studies incorporated the variables of climate change and the environment into the indices to know the environmental impacts of tourism (De Freitas, Scott & Geoff 2007). Ciacii et al. (2021) constructed the index and verified the impact of tourist influx on the environment, logistics and Infrastructure. Further, Fetscherin & Stephano (2016) developed medical tourism index to measure the potential of the destinations. As a development in index-based measurement, Kinash et al. (2019) appraised the indicators suitable for integral index related to lodging and health facilities.

Another strand of the literature analyzed Infrastructure through the performance-satisfaction model. It is considered a soft infrastructure facility and has been tested in Mauritius (Seetannah & Padachi, 2016). Studies analyzed the Infrastructure through the indices of travel and tourism competitiveness and environmental effectiveness. Both measured tourism's environmental impact and found ways to minimize the negatives (Dwyer & Kim, 2010; Miloradov & Eidlina, 2018). An empirical study in the North-Western Federal District of Russia bundled the production infrastructure, public utilities and environmental protection structure and treated them as tourism infrastructure (Velichkina, 2014).

Further, index-based studies assessed the Infrastructure in selected tourism industry segments, namely accommodation, hotel, health, environment and public utilities. Most studies were analyzed at the macro level and compared with the regional features. Further, the requirement of the given items is deeply connected to tourism and topography. It warrants the infrastructure audit and dimension-wise measurement at the destination level. Therefore, infrastructure stratification by character and their role in the destination is needed. Against this backdrop, this analysis attempts to quantify the stock of Infrastructure available at the destinations relatively.

2.1. *Need and Significance of Tourism Infrastructure Index*

Based on worldwide indices, researchers conducted studies in their respective countries to verify results. A study by (Sahminan, Hermansyah & Robbi, 2019) analyzed economic Infrastructure and prepared an infrastructure index for Indonesia. In addition, studies have been conducted to substantiate the influence of Infrastructure on economic and social indicators and its benefits in catching up with foreign investments using the global infrastructure index (Rehman & Noman, 2020, p. 1).

Indices dealing with the measurement of Infrastructure and its interlinkages with other sectors are primarily developed based on secondary data sources. Macroeconomic aggregates are being taken into account, and results are verified accordingly. However, the availability of Infrastructure varies among the regions and must incorporate region-specific indicators. Infrastructure bottlenecks might vary and demands regional verifications. The researchers were motivated to develop region or destination-specific indices to quantify available facilities. The authors quantified separate components of Infrastructure and tried to contribute highly towards the amalgamation of multiple elements of Infrastructure into a single picture. It has been done by formulating composite indices, weighted and unweighted (Goel & Garg, 2018, pp. 103-23; African Development Bank, 2018, p. 1-17).

In tourism-related studies, researchers develop indices to verify the performance of indicators essential for tourist inflow, competitiveness and tourism development (Martin, Mendoza and Roman, 2015, p. 937-57). A combined approach is followed, and numerous aspects of tourism, climate change, and the environment are also discussed. Ciacii et al. (2021, p. 1-14) propounded the tourist index to verify the impact of environment, logistics and Infrastructure on tourism enlargement. Various indicators are combined, and Infrastructure is considered one of the significant components that play an important role in tourism augmentation. Similarly, a study conducted by Kinash et al. (2019) developed their appraisal and dynamics of the integral index of Infrastructure presented by incorporating limited indicators mainly related to lodging and health facilities. A study conducted by Fetscherin and Stephano (2016) developed medical tourism index to measure the potential of nations as medical tourism destinations.

Connotations of tourism infrastructure are widely discussed and empirically verified in multiple studies. However, the deficiency lies in measuring tourism infrastructure and specification of its constituent elements noticeably. The infrastructure gap is measured based on a performance-satisfaction model, which also considers elements of soft Infrastructure and services in Mauritius (Seetanah & Padachi, 2016). The travel and Tourism Competitiveness Index considered Infrastructure part of the environment business, and a study conducted by Dwyer and Kim (2010) adjoined it with destination competitiveness in their model. Few researchers treated Infrastructure as an essential factor in influencing regions' economic and environmental conditions. The prime objective of measurement was to analyze the ill effects of Infrastructure on the environment and the strategies adopted to minimize negative externalities during the construction of tourism infrastructure (Milorado & Eidlina, 2018).

A study conducted by Velichkina (2014) evaluated the tourism infrastructure in the North-Western Federal District of Russia. Production infrastructure like transportation, ICT, public utilities and ecological purification objects are treated as the tourism infrastructure. In addition, elements of service infrastructure like tour operators, accommodation, leisure and entertainment services, catering facilities, trade and security are also considered for constructing Index and analyses. Researchers in their indices need to complete the sorting of infrastructure and tourism infrastructure. So, to present the precise depiction of tourism infrastructure elements and provide a comprehensive measurement is the need of the hour. With this backdrop, it has been tried to depict the significant aspects of

tourism infrastructure and its measurement via applying the composite index method at tourism destinations in Kashmir Valley. Later, the same approach could be extended and applied to other destinations based on their characteristics, need and regional specifications.

2.2. Selection of variables

Destination level assessment appeals to the reconstruction of the term tourism infrastructure. Infrastructure generally comprises public utilities, manufacturing, and service sector facilities. The definitions consider attributes, functions, ownership and their functions at the sub-sectors level (World Bank, 1994; MoSPI – GoI, 2012). Following the characteristics of a general definition, various agencies and studies conceptualized the term tourism infrastructure. World Bank (1994) defined the tourism infrastructure by the components of tourism and public utilities. Tourism infrastructure includes hotels and accommodations, facilities available at tourism spots, markets and malls and sanitation equipment. Public utilities comprise basic facilities and services. Panasiuk (2007) states that tourism infrastructure refers to accommodation, food and beverage, accompanying facilities and information and communication available at the destinations. In addition, they are grouped as a typical, para tourist, and unequivocally. The definition put forward by the Ministry of Tourism, Ontario, Canada (2009) introduced infrastructure ownership and compilation of tourism infrastructure. As per the Ministry of Tourism, Government of India (2018), tourism infrastructure includes destination entry points, basic conveniences, road connectivity, and equipment for tourist activities, parking facilities, toilets, cloakroom facilities, waiting rooms, markets, communication facilities and internet connectivity.

Tourism infrastructure is conceptualized based on the characteristics, functions and geospatial features of destinations. Tourism infrastructure refers to “road and transport, accommodation, tourist markets and shopping malls, public utilities, environmental infrastructure, health care, financial and information technology and sports and entertainment establishments available in the tourism destinations used by tourists, service providers and host community.” According to the conceptualization and past studies, this study selected forty variables and categorized them into fewer than fifteen elements. Further, for meaningful analyses, selected variables of tourism infrastructure are clustered into five dimensions based on their role in destinations. The dimensions are (i) Typical tourism infrastructure, (ii) Public utilities, (iii) Environmental Infrastructure, (iv) Soft Infrastructure, and (v) Sports and Entertainment infrastructure. Table 1 presents the particulars of dimensions and indicators of the tourism infrastructure.

Table 1. Details of Dimensions and Indicators of Tourism Infrastructure

Typical Tourism Infrastructure	Public Utilities	Environmental Infrastructure	Soft Infrastructure	Sports & Entertainment
Road	Telecommunication	Sewage Water Mgt.	Health Care	Ground and Sports
National Highways	Service providers	Drainage Canals	Hospitals	Grounds
District Roads	Landline	Treatment Plants	Beds	Sports Activities
Link Roads	Broadband	Solid Waste Mgt.	First Aid Centres	
Transport	Electricity	Vehicles	Medical Shops	Entertainments
Vehicles (Public)	High Mass Lights	No. of Sinks	Banks	Cool Bars
Vehicles (Private)	Street Lights	Treatment Plants	Banks	Theaters
Centres	Receiving Stations	No. of Dustbins	ATMs	
Hotels	Water Supply		Tourism	
Hotels	Water Supplied (in	Pollution Control	Information	
Guest Houses	MGD)	Testing Centres	Information	
No. of Beds	No. of Public Taps	Monitoring Centres	Centres	
Markets and Malls	Connections (H&B)			
No. of Markets				
No. of Shops				

3. Methodology

3.1. Data Sources

The prime objective is to picture the quantum of tourism infrastructure available at tourism destinations in Kashmir Valley. For the same, secondary data sources were required and gathered from numerous departments providing infrastructure facilities. Departments facilitating facts and figures include Chief Office Public Works Department Srinagar, J & K Transport Corporation, Directorate of Tourism Srinagar, Municipal Corporation Srinagar, Power Corporation Srinagar, Public Health Engineering Department Srinagar, Bharat Sanchar Nigam Limited Srinagar, Municipal Corporation Kashmir, Pollution Control Board Srinagar and Head office Jammu and Kashmir Bank, Srinagar.

Further, official online documents and reliable websites are also utilized for gathering information regarding some aspects of Infrastructure in Kashmir Valley. In addition, certain elements of Infrastructure not available in records were manually quantified by the researcher during the survey and incorporated into the analysis. Data gathered depicts five major destinations, specifically Srinagar, Pahalgam, Kokernag, Gulmarg and Yousmarg. It has been tried to incorporate all the infrastructure segments available at destinations and delimited to the available structures. The total quantity of each element has been considered based on their respective measuring units. Data gathered is arranged by destinations, and the total amount is calculated to verify total tourism infrastructure availability. Then, the available data is converted into composite Index incorporating multi-dimensional elements.

3.2. Composite Index Methodology (Tourism Infrastructure Index)

The comparative analysis to identify the status in each sub-indicator needs the inclusive methodology. Subsequently, index-based analyses were adopted to explore the amount of infrastructure at destinations by dimension-wise and sub-indicator level. According to the dimensions and factors, the composite index method is fit for the tourism infrastructure index. The composite index method is adopted to construct the Tourism Infrastructure Index (TII) based on suitability and expected outcomes. The range of the index value range is 0 to 1, and the formula is as follows:

$$\text{Index} = \frac{\text{Actual Quantity} - \text{Minimum Quantity}}{\text{Maximum Quantity} - \text{Minimum Quantity}}$$

Index construction considers each variable of every dimension of tourism infrastructure at each destination of Kashmir valley. Then the values are aggregated and divided by the total number of variables in each dimension. At last, a composite value of each dimension gives a single value known as the tourism infrastructure index. The incorporation of each dimension value provides the holistic value of the Tourism Infrastructure Index. It is helpful to do a component-wise and destination-wise comparison and to understand the infrastructure status of the Kashmir Valley as a whole. This study listed forty variables and grouped them under fifteen major elements with five dimensions from past studies and field visits. A normalized score of each variable offers the elements and dimensions value and the average of dimensions give the final index value.

Typical Tourism Infrastructure (TII) index value is the composite value of the road, transport, boarding and lodging, and markets and malls. On the other hand, an index value of road is the composite value of different types of roads available at the destination. It applies to all the indicators and sub-indicators.

$$TTI = \frac{Road + Transport + Boarding and Lodging + Markets and Malls}{4}$$

Likewise, Tourism Infrastructure Index is the composite value of Typical Tourism Infrastructure (TTI), Public Utilities (PU), Environmental Infrastructure (EI), Soft Infrastructure (SI), and Sports and Entertainment Infrastructure (S&EI).

$$\text{Tourism Infrastructure Index} = \frac{TTI + PU + EI + SI + SEI}{5}$$

4. Data of Tourism Infrastructure at Destination

Tables 2 and Table 3 present the quantity of tourism infrastructure available at destinations in Kashmir Valley by dimensions and sub-indicators. It is using the number of infrastructure facilities to explain the present condition. It enables us to understand infrastructure stock at the sub-category level among the destinations.

Among the destinations, roads are comparatively unavailable in Pahalgam and Yusmarg compared to others. There is wide variation in the availability and frequency of transportation, and the contribution of private vehicles is significant. The number of vehicles shows a wide disparity among the destinations, which is acute in Kokernag and Yusmarg. Transport centres are shallow in all the destinations, excluding Srinagar. The availability of the number of hotels is poor in Kokernag and Yusmarg, and on the other hand, Srinagar and Gulmarg have adequate hotels and related infrastructure facilities. In the number of markets, there is little difference between destinations; however, it differs in the number of shops. It conveys the size of the market. However, Yusmarg's status in the market and the number of shops could be better, not satisfying visitors' needs. Noticeably, typical tourism infrastructure and its sub-indicators differ among the destinations to a greater extent (Table 2). The quantity of typical tourism infrastructure is categorically less in Yusmarg, followed by Kokernag.

Quantification of public utilities includes three elements: telecommunications, electricity and water supply. The number of companies offering telecommunication services is similar. However, the number of landline and broadband connections varies among the destinations. In Yusmarg and Kokernag, the number of connections is few. A similar picture is noticed in electricity facilities and their sub-indicators as well. The density of households and business units influences the quantity of water demand and the number of public, household, and business water supply connections. However, a considerable variation exists between public taps and household and business connections. In public utilities, Srinagar is filled with all the facilities than others.

Environmental infrastructure includes sewage and solid waste management, pollution control, and sub-indicators. Undeveloped drainage and very few numbers of treatment plants are visible in the study area except in Srinagar. Kokernag and Yusmarg do not have a single sink in their locality and a comparatively low quantity of dustbins. Solid waste treatment plants need to be higher in numbers, indicating the existence of solid waste management issues. The number of pollution monitoring and testing centres is less in the surveyed destinations, and testing centres are unavailable in Kokernag, Gulmarg and Yusmarg.

Table 2. Quantum of Typical Tourism Infrastructure and Public Utilities

Details		Destinations					Total
		Srinagar	Pahalgam	Kokernag	Gulmarg	Yusmarg	
Typical Tourism Infrastructure	Road						
	National Highways	74	32.10	72	49	30	257
	District Roads	1308.76	43	113.50	140	31	1635.76
	Link Roads	364.72	18	424.65	533	29.	1368.72
	Transport						
	Vehicles (Public)	178	15	10	17	01	221
	Vehicles (Private)	658	400	129	265	05	1457
	Centres	06	02	01	02	01	12
	Hotels						
	Hotels	920	99	12	961	12	2004
	Guest Houses	875	332	13	76	10	1306
	No. of Beds	46426	8978	94	2164	435	58097
	Markets and Malls						
	No. of Markets	08	03	03	03	01	18
	No. of Shops	18600	480	100	200	10	19390
Public Utilities	Telecommunication						
	Service providers	04	03	02	03	02	14
	Landline	20465	197	48	145	0	20855
	Broadband	6362	85	24	61	0	6532
	Electricity						
	High Mass Lights	100	40	08	04	13	165
	Street Lights	40000	163	330	422	100	41015
	Receiving Stations	04	01	02	04	0	11
	Water Supply (Quantity in MGD)						
	Water Supplied	21.2	15.21	18.01	0.8	0.11	55
	No. of Public Taps	176	40	200	07	40	463
	Connections (H&B)	57332	34938	38820	92	6611	137793

Source: Various Departments of Kashmir Region, Govt. of J&K (2019-2021)

Hospitals, banks and information centres are included as indicators of soft infrastructure. The Heath care infrastructure status of Yusmarg needs to be improved in all sub-indicators, followed by Gulmarg and Kokernag. A similar trend is noticed in banks and information centres also. There is no bank or ATM in Yusmarg and significantly lesser in other destinations except Srinagar. In the case of tourism information centres, each destination has a single information centre. However, the installation of information displays differs by numbers and is significantly lesser in Yusmarg, followed by Pahalgam.

Currently, sports and entrainments are the tools to know the cultural inheritance of the destinations. In recent decades, tourism agencies and development boards conducting sports and entertainment competitions at the destinations to attract tourists. In this context, the availability of sports and entertainment facilities is considered the destination's strength. Sports and entertainment infrastructure status are measured through grounds, sports activities, cafeterias, and theatres. Table 3 confirms the weakness of Yusmarg in sports infrastructure and activities, but there is slight variation among the destinations in the number of sports activities per year. In Kashmir valley, the majority is Muslim and is not interested in the cultural activities of theatres. As a result, theatres are only available in some of the destinations, and only a few are in popular cities. Cafeterias are available in the study area but only provide some services. Further, their numbers and facilities vary among the destinations.

Table 3. Quantum of Environmental, Soft, Sports and Entertainment Infrastructure

		Destinations					Total
		Srinagar	Pahalgam	Kokernag	Gulmarg	Yusmarg	
Environmental Infrastructure	Sewage Water Management (Canals in KM.)						
	Drainage Canals	600	11	05	0	02	618
	Treatment Plants	17	01	0	0	02	20
	Solid Waste Management						
	Vehicles	247	05	1	06	01	260
	No. of Sinks	262	35	0	01	0	298
	Treatment Plants	01	01	01	01	0	3
	No. of Dustbins	611	1000	220	250	100	2181
	Pollution Control						
Soft Infrastructure	Testing Centres	01	01	0	0	0	2
	Monitoring Centres	23	01	01	01	01	27
	Health Care						
	Hospitals	129	1	1	1	0	132
	Beds	3361	5	30	10	0	3406
	First Aid Centres	129	20	1	1	1	152
	Medical Shops	253	7	15	1	0	276
	Banks						
	Banks	29	2	1	1	0	33
Sports and Entertainment Infrastructure	ATMs	45	4	3	3	0	55
	Information Centre						
	Centres	5	2	3	4	1	5
	Displays	50	20	23	30	15	138
	Ground and Sports Activities						
	Grounds	3	1	1	1	0	6
	Sports Activities	4	4	3	4	2	17
	Entertainments						
	Cool Bars	18	6	3	5	2	34
Entertainment Infrastructure	Theaters	1	1	0	0	0	2

Source: Various Departments of Kashmir Region, Govt. of J&K (2019-2021)

5. Results and Discussions

Table 4 gives values of the tourism infrastructure index and its sub-indicators. The summated view of the comparison of tourism infrastructure by dimensions and destinations are shown in Figure 1 and Figure 2. The tourism infrastructure index results infer that the Kashmir Valley achieved 0.34 out of 1.00. It inferred the prevalence of low infrastructure scores at destinations of Kashmir Valley. The low quantity of Infrastructure is critical in soft Infrastructure (0.27) and environmental Infrastructure (0.29). Many health-related establishments need to improve, followed by banks and information. In environmental Infrastructure, the availability of solid waste management is leading among the sub-categories and others scarce in the study area. Typical tourism infrastructure (0.35) and public utilities (0.34) are equal to or close to the aggregate index value of the study area. Among the sub-indicators of the typical tourism infrastructure, the availability of roads (0.49) is close to average compared to transport, boarding and loading, and markets and malls. The quantity of water supply infrastructure is comparatively good compared to information, communication, and electricity.

A comparison of Infrastructure among the destinations states that all destinations have low Infrastructure compared to Srinagar. Due to political, economic and geographical importance, Srinagar is rich in quantity of Infrastructure. A low score of Infrastructure is highly noticeable in

Yusmarg (0.01), followed by Kokernag (0.20), Gulmarg (0.22) and Pahalgam (0.30). Though Pahalgam scored less in tourism infrastructure, its status is relatively better than other destinations. The following sections offer dimension-wise facts.

5.1. *Typical Tourism Infrastructure*

Road, transport, boarding and lodging, markets and malls are merged as composite values to represent typical tourism infrastructure. The quantity of typical tourism infrastructure is inferior in all the destinations except Srinagar. The quantity position of Yusmarg is poor, followed by Pahalgam, Kokernag, and Gulmarg. The availability of highways and district roads is prominently low in the study region and extensively varies among the destinations. Specifically, it is deficient in Pahalgam, followed by Yusmarg. Destinations located in towns and close to developing regions have a manageable length of road facility. However, the destinations located in rural areas and the inner part of the district needed to be equipped with sufficient road facilities. It compels tourists to go by walking or locally available transport arrangements.

The deficiency of vehicles is acute at Yusmarg and Kokernag. It adversely affects the tourist influx at Yusmarg and the destination's growth. Public and rented vehicle drivers must wait hours to get passengers, mainly on off-seasons. Therefore, private vehicle drivers are reluctant to serve transportation to Yusmarg. Similarly, many tourists cannot visit Kokernag during peak season due to the less frequent transport facilities. The number of public and private vehicles is manageable in Pahalgam and Gulmarg but is less than in Srinagar.

Hotels and guest houses available for tourists accommodation merged under the heading of boarding and lodging facilities. In general, the availability of boarding and lodging facilities differs according to the development of the regions. Especially destinations like Yusmarg and Kokernag face accommodation-related issues at a time of high tourist influx. Therefore, visitors to these destinations must arrange accommodation in nearby towns and famous cities like Srinagar during the peak seasons. In markets and malls, except Srinagar, no destinations have big tourist markets and malls. Even though Pahalgam, Kokernag, and Gulmarg have a market, many shops are limited, and size also matters. In Yusmarg, one general market with few tourism-related shops is available. In the study region, modern market facilities and the range of products need to be improved.

5.2. *Public Utilities*

Public utilities are imperative to provide basic facilities at the destinations and smooth functioning of the tourism industry. Telecommunication, electricity and water and their sub-sets showed the status of public utilities. The quantity of telecommunication facilities is satisfactory in Srinagar regarding the number of service providers and landline and broadband connections. Other destinations' choice to select the service providers is limited, and in Yusmarg, the number of landline and broadband connections is zero. It reveals the non-availability of the telecommunication infrastructure.

The same trend exists in electricity facilities; however, the quantity of electricity establishments is moderately tolerable than the stock of ICT infrastructure facilities. However, it is less in adjacent areas of Yusmarg, and inadequate quantum is evident at Pahalgam and Kokernag. There is no receiving station in Yusmarg, and it possesses fewer street and high mass lights than other destinations. In the case of Kokernag, the need for more highmass lights and receiving stations is the cause for its low score.

The quantity of water supply infrastructure is considerably healthier than other public utilities, namely information and communications and electricity facilities. However, the quantity of water supply

infrastructure available at Yusmarg and Gulmarg needs to be improved. In Gulmarg, the daily water supply is minimal and needs to be improved in public taps and water supply connections. On the other hand, the destination of Yusmarg confirmed a deficiency in the quantity of water supplied and a smaller number of public taps installed by the authorities. In the study area, public utilities are insufficient to meet the host community's and visitors' demands. During the high rate of arrivals available quantum of public utilities used to get an excessive burden. Therefore, it required renovation of the existing structure and additional facilities, especially in Gulmarg, Yusmarg and, required facilities to other destinations of the Kashmir Valley.

5.3. *Environment Infrastructure*

In order to understand the quantity of environmental Infrastructure, sewage, solid waste and pollution control and monitoring infrastructure are observed and used to assess the current status. All the destinations need to be stronger in stock of environmental Infrastructure. Mainly, the number of sewage canals and pollution testing and monitoring centres are inferior. Nevertheless, it considerably differs among the destinations. Deficient sewage and solid waste management facilities are a severe concern for all destinations except Srinagar. Such facilities are very minimum in the case of Kokernag and Gulmarg. The dearth of treatment plants and improper facilities of drainage is the chief cause.

The low stock of solid waste management facilities is evident in the case of Yusmarg and less quantity in Kokernag and Gulmarg. There is no waste sink and treatment plant in Yusmarg and it needs other facilities also. Similarly, other destinations need to contain sufficient vehicles, sinks, and treatment plants. Besides the low stock of sewage and solid waste establishments, pollution control establishments must be improved. The chief cause is that most destinations need more pollution monitoring and testing centres and lack supervision. Inadequate environmental management and monitoring infrastructure in the regions deteriorate tourism products and the sustainability of destinations.

5.4. *Soft Infrastructure*

Health care infrastructure is accumulated in Srinagar and ferociously poor in other destinations. Nevertheless, the quantity of healthcare infrastructure needs to be improved in Yusmarg. A single first aid centre is located at the destination to serve the host community and visitors. Gulmarg contains the minimum number of such facilities, and the quantity provided needs improvement. Similarly, in Pahalgam and Kokernag, the facilities provided are meagre compared to Srinagar. The banks and ATMs are skimpy in all the destinations of the study area. Thus, the quantum of banking infrastructure is manageable in Srinagar with ATM facilities. However, Pahalgam, Kokernag and Gulmarg have banks with a minimum range of services. Further, inadequate internet and broadband facilities significantly affect the use of online banking services. At this juncture, host communities of the destinations and visitors must depend on the facilities in Srinagar. The lack of banking infrastructure affects access to banking services and ATM services; it significantly affects the use of digital payment in tourism markets. Further, the non-availability of ATMs at the destinations adversely affects visitor satisfaction.

The quantity of tourism information centres and related Infrastructure needs to be improved in all the destinations; however, Srinagar is better off. Srinagar and Gulmarg are availed of a manageable quantum of tourism information infrastructure facilities. Though Pahalgam, Yusmarg and Kokernag are famous and attractive destinations of Kashmir Valley, information-related Infrastructure differs from Srinagar. Effective functioning of tourism information is strength to communicate with the

visitors and market tourism products. Further, display boards and details about the salient feature of tourism products disseminate the indigenous character of the destination.

5.5. Sports and Entertainments

As specified in other dimensions of tourism infrastructure, Srinagar occupies a prime place in the sports and entertainment infrastructure. In sports amenities, except Yusmarg, other destinations have a certain amount of Infrastructure in terms of ground and few sports equipment. However, they need to improve in entertainment infrastructure. Few destinations have inadequate sports infrastructure; some still need playgrounds and sports items. It results in a decrease in the number of sports activities conducted at the destinations. Visitors expect physical exercise facilities and fitness items at the destinations. Providing these facilities enables attracting tourists, and it becomes an add-on advantage for the destinations. Entertainment facilities differ among the destinations and are significantly better for Srinagar, followed by Pahalgam. However, such facilities are substantially less for Kokernag and Gulmarg and very poor as the Yusmarg is concerned.

Figure 1. Comparative Status of Tourism Infrastructure in Surveyed Destinations

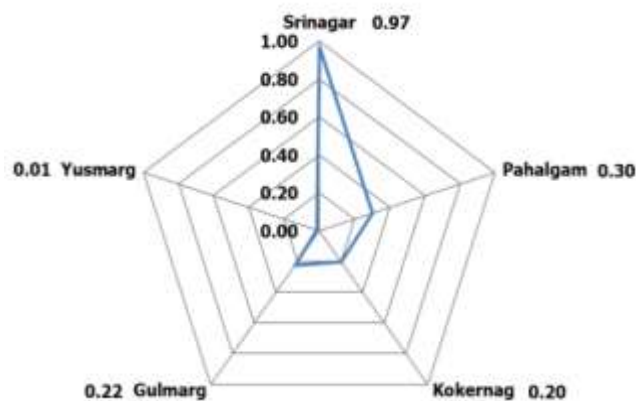


Figure 2. Dimensions of Tourism Infrastructure in Kashmir Valley

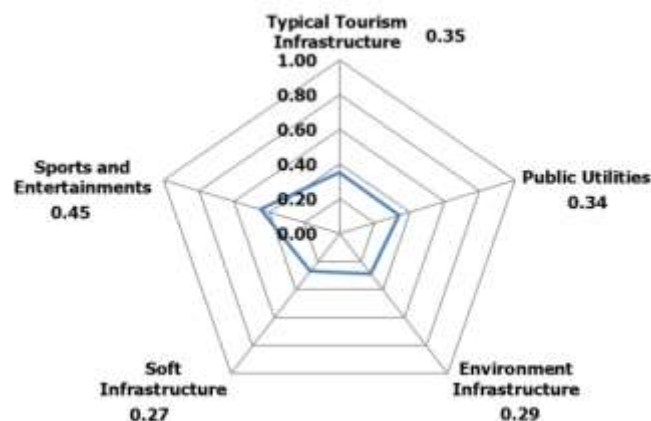


Table 4. Details of Tourism Infrastructure Index and its Indicators of Surveyed Destinations

Destination	Typical Tourism Infrastructure				Typical Tourism Infrastructure	Infrastructure of Public Utilities			Infra. of Public Utilities	Environment Infrastructure			Environmental Infrastructure	Soft Infrastructure			Soft Infrastructure	Sports & Entertainment Infrastructure		Sports and Entertainment Infra.	Tourism Infrastructure Index (TII)
	<i>Roads</i>	<i>Transport</i>	<i>Boarding & Loading</i>	<i>Markets & Malls</i>		<i>ITC</i>	<i>Electricity</i>	<i>Water Supply</i>		<i>Sewage Waste Mgt.</i>	<i>Solid Waste Mgt.</i>	<i>Pollution Control</i>		<i>Health Care</i>	<i>Banking</i>	<i>Information Centres</i>		<i>Sports Amenities</i>	<i>Entertainments</i>		
Srinagar	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.99	1.00	0.64	0.96	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97
Pahalgam	0.02	0.29	0.22	0.16	0.17	0.01	0.21	0.50	0.24	0.04	0.54	0.50	0.36	0.05	0.08	0.14	0.09	0.67	0.63	0.65	0.30
Kokernag	0.73	0.08	0.00	0.15	0.24	0.00	0.18	0.84	0.34	0.00	0.28	0.00	0.10	0.02	0.05	0.23	0.10	0.42	0.03	0.22	0.20
Gulmarg	0.67	0.23	0.39	0.15	0.36	0.01	0.34	0.00	0.11	0.00	0.30	0.00	0.10	0.00	0.05	0.43	0.16	0.67	0.09	0.38	0.22
Yusmarg	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.04	0.06	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Kashmir	0.49	0.32	0.32	0.29	0.35	0.20	0.35	0.48	0.34	0.22	0.35	0.29	0.29	0.21	0.24	0.36	0.27	0.55	0.35	0.45	0.34

Source: Computed by researcher based on data collected from various departments of Govt. of Jammu and Kashmir (2019-2020)

6. Conclusion

The infrastructure quantity varies by destination and dimensions. Sub-indicators of typical tourism infrastructure achieved a below-average score in quantity as per their index value. Road facilities are close to average, which is different in all the destinations, especially Pahalgam and Yusmarg. The consequences of the low quantity of road infrastructure influenced the number of vehicles available at the destinations. It is negatively affecting the destinations located distant from main towns and cities. These issues affect the competitiveness of distant destinations rich in tourism products. Due to economic development and political importance, boarding and lodging Infrastructure significantly differ between Srinagar and other destinations. However, the status of accommodation infrastructure continues the same trend is evident. It is visible in Yusmarg and Kokernag. During peak seasons, visitors of these destinations are forced to arrange accommodation in nearby towns; therefore, paying guest arrangements is suitable to solve the problems. Government and tourism agencies are required to take the initiative without disturbing the culture and tradition of the valley. The number of markets and shops is limited, and modern purchase facilities must be improved. Mainly, shops for indigenous products of the destinations are meagre. Initiatives for the advanced purchase facilities and destination-specific production and marketing of indigenous products enable various choices for visitors and economic opportunities for locals.

In the study area, public utilities need to be increased to meet the host community's and visitors' demands. Deficiency is acute in Kokernag and Gulmarg; however, other destinations need further improvement. During peak seasons, the available quantum of public utilities is burdened and sometimes fails to serve its purpose. Therefore, it required renovation of the existing structure and the establishment of additional facilities at the destinations of the Kashmir Valley. The quantity of environmental management and monitoring infrastructure facilities could be higher. Less solid and sewage waste management structures and pollution monitoring centres are visible in all the destinations except Srinagar. It affects the environmental quality, tourism products and sustainability of the destinations.

Healthcare and banking facilities could be more varied in most destinations. However, Yusmarg and Pahalgam could be more suitable facilities. In particular, health care, banks, and ATMs should be focused on developing soft Infrastructure. In addition, the lack of facilities for tourism information is visible in all the destinations, and it needs to be strengthened by appropriate infrastructure development programmes. In the case of sports establishments, most of the destinations have single playgrounds with a shortage of sports equipment. It is deplorable in Yusmarg. Like other dimensions of tourism infrastructure, the quantity of entertainment facilities needs to be improved and varies among the destinations. The entertainment infrastructure must provide a range of products and facilities equal to other national destinations. It warrants training and development programmes for the service providers at the destinations.

In total, Srinagar is playing a role as a tourism hub of Kashmir Valley. All the destinations depend on Srinagar's Infrastructure for accommodation, transport, health, banking, and other needs. It involves massive costs in terms of time and money. Further, the non-availability of adequate Infrastructure at various destinations significantly affects the tourism potential and development of the destinations. The Infrastructure available at Srinagar may be considered a target, and a sufficient quantity of different dimensions needs to be provided based on the requirements of the respective destinations. Therefore, developing an index and measuring the amount of Infrastructure by destinations may be widely helpful in rectifying existing deficiencies.

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