International Journal of
Economics Development Research, Volume 4(1), 2023
pp. 111-125

Conceptualisation, Systematic Review and Research Opportunities in the Broad Domains of Tourism Infrastructure

Gowhar Ahmad Wani [1], Arshid Hussain Peer [2],
Ilma Rizvi [3], Shabir Hussain Malik [4]

Abstract:

This paper explored the conceptualisation and research gaps in the field of tourism infrastructure. A key objective is to review tourism infrastructure works and underline the uncharted areas. The articles published between 2007 and the end of 2022 has been selected to verify the results. A comprehensive format has been presented to depict the author's details, objectives, methodology, and results and conclusions separately to help budding researchers identify the research gaps. The appraisal shows that certain areas must be correctly explored theoretically, hypothetically or empirically. The function of infrastructure to enhance the quality of destinations still needs to be explored and needs empirical analysis. The accessible literatures are botched to give precise, practical verification of tourism infrastructure's influence on services and tourism resources management. This study significantly advances the literature in the field of tourism infrastructure and is very beneficial to aspire researchers conducting further research investigations since it providesa research pathway. As a result, the study will add positively and is obliging for lately researchers to conduct studies on uncharted areas of tourism infrastructure.

Keywords: *Tourism Infrastructure, Conceptualisation, Systematic Review, Research Gap*

1. Introduction

Infrastructure facilities significantly impact the tourism industry (Seetannah et al., 2011). As a result, infrastructure enhancement based on destination competitiveness and tourist expectations is critical for industry expansion (Cvelber et al., 2016; Sonja & Ivana, 2016). The augmentation range may differ depending on the nature and type of tourism, but studies have found a strong link between the quantity of infrastructure and tourism development. Thus, a lack of necessary facilities directly impacts the operation and negatively impacts tourist satisfaction (Abdullah, Arman & Mastura, 2014).

[1] *Central University of Kerala, India. gowharwani990@gmail.com*
[2] *Department of Economics, Jamia Millia Islamia University, New Delhi, India*
[3] *Department of Economics, Jamia Millia Islamia University, New Delhi, India*
[4] *Masters in Business Administration, Hefei University of Science and Technology, China*

Lack of maintenance and outdated technology decrease functioning capacities and raise sustainability concerns in addition to inadequate infrastructure (Mello et al., 2016; Hidayat et al., 2017). The necessity for high-quality infrastructure was recognised, and nations developed adoption programmes. It strives to reduce the adverse effects of tourism by supporting infrastructure facilities, and it wants to provide advantages for all stakeholders now and in the future. Lack of infrastructure disrupts travel plans and diverts businesses from sustainable development initiatives (Boer & Cottrel, 2007; OECD, 2014).

Studies evaluated the inadequate state and the lack of solid waste management, public utilities, and critical infrastructure and offered solutions (Ministry of Tourism - Ontario, 2009; Ayyapan & Kumar, 2014; Cuka, Slawomir & Tomas, 2015). In contrast, indices are built to assess the infrastructure gap worldwide. The main objective is visualising the state and connections between infrastructure and economic development (Donaubauer, Meyer, & Peter, 2014; Sahminan, Hermansyahand Robbi, 2019). The impact of infrastructure on economic and social indices was examined in little research (Rehman & Noman, 2020).

Similarly, indicators' performance and their impact on the number of visitors, competitiveness, and development were measured in tourism studies (Rehman et al., 2017). Additionally, they included environmental and climate change variables in the indices to determine the effects of tourism on the environment (Gongmei, Schwartz and John, 2009). The index was created, and the effect of the tourist influx on the environment, logistics, and infrastructure was confirmed by Ciacii et al. in 2021. An empirical study in the North-Western Federal District of Russia combined the infrastructure for production, public services, and environmental protection and considered them as infrastructure for tourism (Velichkina, 2014).

International organisations and researchers carried out investigations during that time. Undoubtedly, many issues have been discussed, looked into, and continuously assessed. Therefore, an evaluation of "what had been done and what is further necessary" is considered crucial. Conceptual, methodological, theoretical, and other analytical gaps may be discovered by thoroughly reviewing the available literature. This study attempted to contribute to the respective domains in the given context by reviewing the body of prior research, with the primary goal of identifying gaps in the existing body of knowledge and potential areas for future investigation.

Background and Conceptualization of Tourism Infrastructure

Jan Tinbergen stated that investment in primary industries is infrastructure, and manufacturing is the superstructure. Jochimsen (1996) studied the market economy perspectives and defined infrastructure as the "addition of capital good, institutional and personal." Nevertheless, he classified the dimensions of infrastructure by their attributes (Jochimsen, 1966). Nevertheless, Buhr (2003) defined infrastructure based on attributes and functions and stated infrastructure as a 'bundle of institutional, material and personal facilities.

World Bank (1994) categorized infrastructure as 'economic infrastructure' and 'social infrastructure'. Economic infrastructure includes "long-term establishments for production and transaction of business entities and households including public utilities." The social infrastructure contains "education and health care" (WorldBank, 1994). MoSPI - Govt. of India (2012) defines infrastructure based on the Rangarajan Commission recommendations. It includes multimodal transportation, electricity, various energy, communication, water, irrigation, and sanitation facilities (MoSPI - GoI, 2012).

Definitions of Jan Tinbergen, Jochimsen and Buhr analyzed infrastructure in terms of attributes, functions, and ownership. However, reports of the World Bank and GoI emphasized through sub-sector level and attributes and functions. It clarifies the scope of the term infrastructure subject to the nature and context of the study.

With this background, to define the tourism infrastructure works done by World Bank (1994), Panasiuk (2007), Ministry of Tourism, Ontario, Canada (2009) and Ministry of Tourism - Government of India are considered.

World Bank defined the tourism infrastructure through the components of tourism and public utilities. Tourism infrastructure comprises hotel training schools, public beach facilities, shopping centres, food storage complex and marketing programme, waste disposal, and beach-cleaning equipment. Public utilities include access roads, telecommunication, energy, water supply and sewerage facilities (World Bank, 1994)

According to Panasiuk, tourism infrastructure refers to accommodation, food and beverage, accompanying facilities and information and communication available at the destinations. Further, tourism infrastructure has been stratified as typical, paratourist, and unequivocally. Typical tourism infrastructure is "accommodation, other facilities for arrivals servicing, tourist information and trails." Paratourist infrastructure refers to "roads and transport points, local facilities including communal and public transport, trade and service facilities." Unequivocally classified infrastructure is "gastronomy, accompanying facilities, sports, cultural, leisure and entertainments" (Panasiuk, 2007).

For the audit of infrastructure needs and a gap at destinations, the (Ministry of Tourism, Ontario, Canada, 2009) defined tourism infrastructure as "agencies, attractions, convention centres, and provincial parks and conservation areas, cultural facilities, infrastructure that drives investment in the tourism sector and, leverages partnerships / private sector contributions, and travel information centres" (Ministry of Tourism, Ontario, Canada, 2009).

PRASHAD of MoT - Govt. of India (2018) listed the infrastructure required at destinations. It includes "destination entry points, basic conveniences, road connectivity, equipment for tourist activities, parking facilities, toilets, cloakroom facilities, waiting rooms, bazaars, communication facilities and internet connectivity" (Ministry of Tourism - Government of India, 2018).

Similar to general infrastructure, definitions of tourism infrastructure also consider attributes and functions. However, the operationalization of tourism infrastructure should incorporate destinations (geospatial) and attributes and functions. Destinations are a hub for all tourism activities and the industry's functioning.

The World Bank gave the concept (1984) and underlined the attributes and functions of the tourism infrastructure elements. In contrast, the Ministry of Tourism - Ontario, Canada (2009) and, MoT - Govt. of India (2018) highlighted the infrastructure at the destination level. The structure of tourism infrastructure offered by Panasiuk (2007) satisfied the attributes, functions and destinations. Hence, Pansiuk's conceptualization of tourism infrastructure is comprehensive in understanding and analysing the tourism infrastructure at destinations.

It confirms that infrastructure is a prerequisite for destination development. It applies to all sorts of tourism and destinations. With this backdrop, tourism infrastructure can be defined as "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."

2. Methodology

Materials and Data Webs

A systematic review method has been considered to classify the subject matter of tourism infrastructure research into two major categories, including (a) issues, challenges, and needs and (b) tourism infrastructure and development. A significant number of data webs were examined to gain a clear understanding of research gaps, consistency, and representativeness. Standard data webs, terminology, and citation popularity are used to choose articles for review. Articles were selected from various journals published by renowned publishers, including Scopus, Web of Science, and ABDC. This study also carried out a manual search of several well-known sites in order to find papers related to tourism infrastructure. Some authentic data webs were investigated for this validation to understand research gaps accurately. Articles were taken from journals having a good reputation in front of the scientific research community. Articles published between 2007 and the end of 2022 has been selected to verify the results. Relevant studies are sorted by date, journal, and subject matter, highness of contents, focus and conclusions.

3. Empirical Findings/Result

Systematic Overview of Existing Literature

Infrastructure facilities and their efficacy are prime issues at destinations. The studies assessed present infrastructure and growing tourist influx to identify the gap and its determinants. This history of tourist arrival and accommodation facilities is treated as indicators (Ayyapan & Kumar, 2014; Cuka, Slawomir & Tomas, 2015; Mello, Kamat & Anais, 2016; Hidayat et al., 2017). Bashir & Goswami (2016)

showed that tourism activities generate a significant percentage of solid waste in tourist destinations. As a result, the infrastructure gap in solid waste management severely affects the cleanliness of the destination. In addition to the infrastructure gap, quality is vital for their functioning (Kadi & Suklabaidya, 2014).

The prevalence of gaps in quantity and quality badly affects the infrastructure. It leads to negatives to the ecological system and environmental resources (Silva & Emily. 2017; Yousf & Ali, 2018). Lack of maintenance and management is highlighted, and appropriate strategies are recommended (Jamil & Paud, 2010; Abdullah, Razak & Jaffer, 2014).

On the other hand, tourism infrastructure and development studies mainly focused on transport and competitiveness. It analyzed the competitiveness of the transport sector and its influence on tourism development (Navickas & Kausaite, 2009; Sonja & Ivana, 2016; Mandic, Mrnjabac & Kordic, 2018; Seetanah & Juwaheer, 2011; Augustine & Emmanuel, 2016; Minyu, 2016). Ranking of infrastructure investment explored new avenues for development, including soft infrastructure (Rani, Afifudin & Akbar, 2017; Seetanah & Padachi, 2016).

Following the infrastructure and tourism development, Aniah & Otu (2012) tried to find its influence on sustainable tourism. It explained the implications ofinfrastructure development on sustainable tourism. Establishing infrastructure reduces the environmental negatives and gives positive externalities to the stakeholders. It is especially beneficial to the host community, which is the prime target of tourism negatives. However, the corollary between infrastructure and sustainable tourism must be empirically established.

The review confirmed the significance of infrastructure in tourism development. It showed paradigm shifts and the role of infrastructure in sustainable tourism. However, reviewed studies confirmed they needed to provide concepts applicable to destination level analyses, factors determining the infrastructure performance and association between infrastructure and tourism destinations. To understand clearly and to present a brief description of "what has been done" is shown by the presentation of papers via authors, objectives, materials and methods and Conclusions below:

Table 1. Presentation of Papers via Authors, objectives, materials and Methods and Analysis and Discussions/Conclusions.

Author(s)	Objectives	Materials and Methods	Analysis and Discussions/Conclusions
Boers and Cottrell, (2007).	To develop a comprehensive approach for planning sustainable tourism infrastructure at destinations based onGIS methodology.	Case study Methods are employed and Principle Component Analysis. And Hierarchal Cluster Analysis was employed.	Elements of tourism and Geo-information services integrated to develop a new GIS supported approach for sustainable tourism infrastructure planning in protected areas.
Khadaroo & Seetanah, (2007)	To study the role of transport infrastructurein tourism development of Island of Mauritius.	Information about 26 countries of Europe, USA, African and Asia collected for the period of 1978 to 2003 from CentralStatistical Office ofMauritius. And	Positive impact of transportation on tourist influx. Tourists from Europe and USA assign much importance to transport infrastructure as compared to Asian and African countries.

Author(s)	Objectives	Materials and Methods	Analysis and Discussions/Conclusions
		Regression analysis was employed.	
Panasiuk, (2007).	To study the role and significance of infrastructure in tourism development	Critical review of existing studies.	Major influence of tourism infrastructure on tourism development.
Farhan, A. (2009).	Impact of infrastructure on development of the heritage sites of Petra in Jordan.	Use of questionnaire and interviews to tourism experts. Use of mean, S.D and percentage analysis.	Positive influence of infrastructure on the economic, social and environmental dimensions of the heritage site of Petra in Jordan.
Ministry of Tourism, Ontario, (2009).	To study the current status of tourism infrastructure in Ontario.	Use of secondary sources of data	Deficient infrastructure degrades the quality of tourism services. Need of comprehensive framework and modernization of services.
Navickas & Kausaite, (2009)	To examine the relationship between tourism competitiveness and tourism development.	Use of secondary sources of data	Strong correlation between tourism competitiveness and tourism development.
Jamil & Paud, (2010).	To study the present status of infrastructure and management system in three Asian cities.	Secondary data Field observations and field census.	Urban tourism in Asian cities demands expansion of alternative transportation and cost effective services to satisfy tourists. Tourism infrastructure boosts image of destinations and helps to satisfy tourists at the greater extent.
Mishra, Rout & Mahapatra, (2011).	To analyze the causality between tourism and economic growth in India.	Use of time series models for the period of 1978 to 2009. Use of Dicky Fuller Unit Root Test, Johansen's Co-integration Test and Granger Causality Test.Use of Pearson's Correlation Coefficient and T-test.	Positive impact of tourism on growth of India. Unidirectional Causality from tourism activities to economic growth of India.
Seetanah & Juwaheer, (2011).	Role of infrastructure in tourism growth of island of Mauritius.	Panel data of tourist arrivals over the period of 1985-2006. Regression analysis and Hausman Specification Test.	Tourism prices, per capita income and infrastructure highly influence the tourist arrivals in Mauritius.
Aniah & Otu, (2012).	To study the impact of infrastructure on tourist influx in Ranch Resort, Nigeria.	Participatory Research Method Primary data collection through questionnaires, interview schedules and observations. Use of Chi- square test to verify the hypothesis.	Increase in tourist influx due to improvement in tourism infrastructure in the Ranch Resort of Nigeria.
Abdullah, Razak & Jaffer, 2014.	To study the issues and challenges in infrastructure growth in Malaysia.	Descriptive analysis	Financial constraint, ineffective monitoring and irresponsibility of contractors, limited quantity, poor quality and improper

Author(s)	**Objectives**	**Materials and Methods**	**Analysis and Discussions/Conclusions**
			maintenance cited as chief issues.
Ayyapan &Kumar (2014).	To analyze the relationship between tourism demand and Infrastructure in India.	Use of secondary data collected from Ministry of Tourism, Govt. of India and analysis conducted through Ordinary Least Square Methods.	Infrastructure is highly related to tourism demand. Closeness of domestic tourist arrival and infrastructure is significantly higher than foreign tourist arrival
Delaplace et al., (2014).	Role of high speed rail to influence the tourists' preferences to choose destinations.	Comparison of two case studies conducted in Rome and Paris by interviewing 241 and 226 persons in Rome and Paris	In case of Rome, high speed rail service didn't influence the revisit of the site in near future. In Paris high speed rail services highly influence and motivate.
Velichkina, (2014).	To present a methodology for the assessment of regional tourism infrastructure in North west of Russia.	Self constructed regional tourism infrastructure index.	Regional tourism infrastructure Index and its measurement.
Kadi & Suklabaidya, (2014).	To analyze the gap between expected and actual quality of wine tourism infrastructure in Maharashtra.	Use of Secondary and primary data. And Comparison table was framed to check the difference in mean values.	There exists gap between the expected and actual quality of wine tourism infrastructure in Maharashtra.
Cuka, Slawomir & Tomas, (2015).	Comparison of status of infrastructure in Central and Eastern Europe with that of other states.	Use of Secondary data	Trend of infrastructure showed downward path in Central Europe and upward movement in Switzerland and Norway.
Ramjit, (2015).	Role of infrastructure in rural tourism of Kashmir valley.	Systematic review of existing literature.	Most of the rural areas lack tourism infrastructure especially tackling a problem of poor connectivity.
Augustine, & Emmannuel, 2016.	To assess the level of infrastructure and its impact on rural tourism in Nigeria.	Direct interviews and primary surveys conducted and employed use of Canonical correlation	Shops, festivals, water related facilities, road and accommodation positively supports tourism development. Negative impacts of poor road network on agriculture which is
Bashir & Goswami, (2016).	Issues and challenges in Municipal waste management infrastructure at Pahalgam in J&K.	Use of primary and secondary data.	About 18.72 tons of solid waste is generated per day and accommodation sector is the major generator.
Mello, Kamal & Anais, (2016).	To assess infrastructure gap in Goa.	Use of Secondary and primary data and use of Importance-Performance Analysis	Results confirmed infrastructure gap in Goa.
Minyu, 2016.	To study the influence of infrastructure on tourism sector in China through 'Wuhan to Guangzhou' high speed rail.	Secondary data for the period of 2005 - 2013. For analysis, Difference in difference methods and regression analysis was employed.	Regression model proved the positive impact of infrastructure on tourism development.
Seetanah & Padachi, (2016).	To assess the gapbetween perceived and actual level of soft infrastructure services in Mauritius.	Use of Secondary and primary data and use of Importance -satisfaction model.	Infrastructure gap prevailed in the island of Mauritius. Tourists offer much importance to soft infrastructure however less as compared to tourism and

Author(s)	**Objectives**	**Materials and Methods**	**Analysis and Discussions/Conclusions**
Sonja & Ivana, (2016).	To examine the relationship between tourism competitiveness and tourism growth in South East European countries.	Secondary data taken from travel and tourism competitiveness index (2007-13). For analysis, correlation and regression analysis was employed.	Strong positive correlation between tourism and infrastructure competitiveness.
Hidayat et al., (2017).	To analyze the present status of tourism infrastructure in western Sumitra of Indonesia.	Interviews conducted to officials, and stakeholders of tourism.	Results confirmed significant value for transportation facilities and poor status of accommodation facilities.
Khan & Dong, (2017).	Impact of transportation and related services on inbound and outbound tourism.	Secondary data for theperiod of 1990-2014 collected from World Bank. For analysis, Travel and Tourism Index was constructed and methods like OLS, Interpolation techniques, GCT, CIT, VD and IRF were employed.	Inbound and outbound tourism showed a bi-directional relationship with air transportation, railways, trade openness and travel and transport services.
Rani, Afifudin & Akbar, (2017).	To analyze tourism infrastructure prioritization and potential investment in Sabang Island, Malaysia.	Primary data collected from various stakeholders and experts of tourism. For analysis, Super Decision Software was used.	Destinations of Tupin, Layeu gave a top priority to accommodation whereas Gapang and Rubiah gave a highest importance to accommodation
Silva & Emily, (2017).	To study the concept of ecosystem infrastructure.	Review of literatures	Out of the total studies, 88.3 per cent treated the green infrastructure as a proxy of ecosystem infrastructure.
Yousf & Ali, (2018).	To enquire status of tourism infrastructure and incidence of environmental issues around the Dal Lake in Kashmir Valley.	Secondary data collected from Directorate ofTourism, Srinagar, Jammu and Kashmir. Also, primary data collected by means of survey of eighty tourists at the destinations.	Tourists registered lack of infrastructure facilities for appropriate cleaning of internal sections of lake and plastics, wastage disposal and rationalize the houseboat ride.
Mandic, Mrnjabac & Kordic (2018).	To study correlation between tourism infrastructure and tourism growth in South Mediterranean destinations of Croatia, Europe.	Primary survey conducted in two regional tourism board's covering 16 towns, 22 municipalities and 1 island.	Positive correlation between tourism infrastructure and tourism development in the region.
Gokmenoglu & Eren (2020)	To investigate the role of international tourism on the energy consumption of Turkey.	Linearity test, unit root test, cointegration and causality tests, are employed for analyzing the impact of tourism on energy consumption of the Turkey.	Energy consumption is a crucial input that affects the economic growth of Turkish economy.
Aslan, Altinoz & Özsolak (2021)	To analyze the relationship among international tourism, energy consumption, carbon dioxide emissions, and economic growth in Mediterranean countries	Causality test preceded by simple OLS regression is employed here for the 1995–2014 data period.	The tourism-led growth hypothesis stands valid for the low growth levels, but deviations are observed for the middle growth level.

Author(s)	Objectives	Materials and Methods	Analysis and Discussions/Conclusions
Adedoyin et.al (2021)	To examine theenvironmental consequence of economic complexities and tourism in the EU, with special considerations for the role of Brexit and the Greece bailout crisis.	Panel data at first was run with pooled-OLS, then it was proceeded to choose between fixed and random effect model. Finally, to control for endogeneity this study employed GMM-generalized method of moments.	Across the major EU regions, the occurrence of internationaltravel, free economy, andfinancial crisis does not impact the environmental problems. Also, tourism, energy consumption and dummy Brexit are significant in predictingcarbon emission.
Wei & Ullah (2022)	To study the importance of tourism and ICT industry in development economy and their potential effect on the country's environmental quality in digital era.	For empirical study, FMOLS, DOLS and quantile regression techniques are employed.	The results reveal that tourism and digitization improve environmental quality. It implies that as tourism and digitization grows CO_2 declines.

Source: Designed by author

Research gaps and future research trends

This part of the study tries to analyze the research gaps prevalent in areas of infrastructure and its corollary with services and sustainable tourism. Conceptual, Theoretical and empirical studies are critically reviewed and evaluated to conclude. It has been tried to highlight the unexplored areas and the possibilities for further research that could be done in future.

Studies done in the field of infrastructure are reviewed and critically analysed. At first, the term infrastructure needs to be correctly debated and discussed to presentits holistic picture. The conceptualisation of the term infrastructure needs to be further explicated, particularly in the context of its features at the destination level. Most of the studies focused on individual elements and considered physical aspects vital. However, a comprehensive interpretation and

Understanding of the term infrastructure must be improved. Therefore, studies conducted in the field of tourism infrastructure need more depth and complete understanding. In this context, the first imperative gap in the arena of infrastructure is the need for complete conceptualisation and interpretation that needs to be tackled by further research and analysis.

Few studies evaluated issues and challenges in the development and maintenance of infrastructure at tourism destinations and analyzed the infrastructure gap in urban tourism regions (Ministry of Tourism - Ontario, 2009; Ayyapan & Kumar, 2014; Cuka, Slawomir & Tomas, 2015; Mello, Kamat & Anais, 2016; Jamil & Paud, 2010; Hidayat et al., 2017; Ramjit, 2015). Appropriate management strategies and strong policy execution are treated as vital for removing gaps and augmenting tourism infrastructure considered indispensable.

The infrastructure gap is widely analysed and discussed in the fields of critical tourism infrastructure, public utilities, and solid waste disposal systems. Further, it is elaborated on how issues and challenges in infrastructure affect the development of

destinations and put hurdles for the appropriate management and long-term sustenance. Though researchers analyse the infrastructure gap and its impact, however, have yet to study the factors responsible for variation in the infrastructure gap among the regions. Accordingly, a new study can be conducted in the respective area.

Tourism infrastructure matters in quantity and quality, and the gap in any of them gives birth to sub-standard services and sustainability issues. Existing literaturestudied the impact of deficient infrastructure on the quality of services and other environmental issues. It is endorsed that the dearth of environmental infrastructure and allied services gives birth to sustainability issues and problems (Abdullah, Razak & Jaffer, 2014; Bashir & Goswami, 2016; Kadi & Suklabaidya, 2014; Silva& Emily, 2017; Yousf & Ali, 2018).

It is noticeable that the role of infrastructure in services still needs to explore empirically. Similarly, the impact of the infrastructure gap and sub-standard services on sustainable tourism is separate from theoretical and practical discourse. It shows the deficiency in the respective area and calls for sophisticated and scientific research to be initiated. In the present context, research done in sustainable development is appreciated and accepted around the globe, and sustainable tourismis one dimension of it. Therefore, researchers working on sustainable tourism havean opportunity to research the gaps above.

Most studies broadly confer infrastructure competitiveness, growth and transportation related negotiations (Khadaroo & Seetanah, 2007; Navickas & Kausaite, 2009; Delaplace et al., 2014; Minyu, 2016; Sonja & Ivana, 2016; Khan & Dong, 2017). Only some studies analysed innovative ideas of tourism infrastructure and tried to identify its impact on tourism development by components.

At the same time, researchers conducted studies on the significance of transportation, railways and water supply on tourist inflow (Seetanah & Juwaheer, 2011; Augustine & Emmanuel, 2016; Seetanah & Padachi, 2016; Rani, Afifudin & Akbar, 2017). A small magnitude of researchers tried to identify the impact of infrastructure on tourism development and its role in the quality of life and boosting the image of the destinations (Aniah & Otu, 2012; Mandic, Mrnjabac & Kordic, 2018).

Existing studies inveterate implications of infrastructure in tourism enhancement and puts a hand to understanding the relationship between elements of infrastructure and sustainable tourism. Here, it is tinted that the existing studies could have given apparent empirical evidence on the impact of tourism infrastructure and services on sustainable tourism. Fulfilment of such a gap seems exceptional and calls for the involvement of researchers highly advanced in methodology and scientific research techniques.

4. Conclusion

The provision of tourism infrastructure is obligatory to ensure the continuous performance of destinations. There is a positive corollary between tourism development and infrastructure, and therefore imperative to enlighten the shape of tourist places. Infrastructure elements are vital to instigating progress, and their damage cause for ill performance. As a result, the adequate quantity and quality of infrastructure are obligatory and need of the hour to promote the tourism potential of destinations, regions and nations worldwide.

To maintain quantity and quality, researchers have done research to identify the issues, challenges and needs of tourism infrastructure. These studies focused on gaps, maintenance and development issues, quality and environmental aspects. Few authors studied the forms of infrastructure and their valuable models. However, sure researchers studied tourism infrastructure and its impact on the development of destinations. Transport related issues, competitiveness and issues related to unplanned infrastructure remained robust discussions. In addition, few papers described infrastructure's role in enhancing the benefits of the host community and its relationship with ecology.

No doubt, researchers have conducted studies to analyse different aspects and associations of tourism infrastructure. Nevertheless, the appraisal shows that certain areas still need to be correctly explored conceptually, theoretically or empirically. At the first level, a lack of depth in conceptualisation is perceptible, which needs further research. Researchers measure the infrastructure gap, but the factors responsible for the dearth of infrastructure in regions and destinations are only partially explored.

The function of infrastructure to enhance the service quality of the environment still needs to be explored and needs further empirical analysis. At the same time, more studies need to empirically analyse the influence of infrastructure or infrastructure gaps on the dimensions of environmental sustainability. Lastly, it is confirmed that the accessible literatures are botched to give precise, practical verification of tourism infrastructure's influence on services and natural resources management. In this context, further research could be done in the respective domains by applying more advanced scientific research tools

References:

Abdullah, Razak and Jaffer. (2014). Public Tourism Infrastructure: Challenges in the Development and Maintenance Activities. *4th International Conference on Tourism Research* (4ICTR)(12) : 1-8.

Adedoyin, F. F., Agboola, P. O., Ozturk, I., Bekun, F. V., & Agboola, M. O. (2021). Environmental consequences of economic complexities in the EU amidst a booming tourism industry: accounting for the role of brexit and other crisis events. *Journal of Cleaner Production,* 305, 127117.https://doi.org/10.1016/j.jclepro.2021.127117

Agénor, R. P. (2005). Infrastructure Investment and Maintenance Expenditure: Optimal Allocation Rules in a Growing Economy. Manchester University: 1-29.

Aniah and Otu. (2012). Sustainable Tourism Development in Cross River State Nigeria. Eco-Tourism and Sustainable Tourism: New Perspectives and Studies, United States of America (1st Edition): Apple Academic Press: 203- 11.

Archer, B., Cooper, C. and Ruhanen, L. (2005). Positive and Negative Impacts of Tourism. Global Tourism (ed. 3rd) by William F. Theobald: Elsevier Science 200 Wheeler Road Burlington- 01803.

Aslan, A., Altinoz, B., & Özsolak, B. (2021). The nexus between economic growth, tourism development, energy consumption, and CO 2 emissions in Mediterranean countries.https://doi.org/10.1007/s11356-020-10667-6

Augustine and Emmanuel. (2016). Analysis of the Linkage between Infrastructure Provision and Tourism Development in the Rural Areas of Rivers State,Nigeria, Using Canonical Correlation Analysis. *International Journal of Social Sciences*, 10(2), 88-103.

Ayeni and Ebhgon, (2012). Exploring Sustainable Tourism in Nigeria for Developmental Growth. *European Scientific Journal*, (8) 126-140.

Ayyapan.V and Kumar.S (2014). Infrastructural determinants of Tourism in India. *Atna Journal of Tourism Studies*, 9(1), 63-73.

Bashir, S. and Goswami, S. (2016). Tourism Induced Challenges in Municipal Solid Waste Management in Hill Towns: Case of Pahalgam. *Procedia Environmental Sciences*, (35), 77 – 89.

Boers, B. and Cottrell, S. (2007). Sustainable Tourism Infrastructure Planning: A GIS-Supported Approach. *An International Journal of Tourism Space, Place and Environment,* 9(1), 1-21.

Cuka. P, Slawomir and Tomasz. D. (2015). Development of Tourism Infrastructure in the regions of central and Eastern Europe. Innovation Vision 2020: From Regional *Development Sustainability to global Economic Growth*, (25), 402-417.

Delaplace et. al. (2014). Can High Speed Rail foster the Choice of Destination for Tourism purpose? EWGT2013-16th Meeting of the EURO Working Group on Transportation. Procedia- Social and Behavioral Sciences, (111) : 166-75.

Farhan, A. (2009). The Perceived Impact of Tourism Infrastructure on the Development of a Heritage Site: The Case of Petra, Jordan. Thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy, 1- 24.

Gokmenoglu, K. K., & Eren, B. M. (2020). The role of international tourism on energy consumption: empirical evidence from Turkey. Current Issues in Tourism, 23(9), 1059-1065. DOI: 10.1080/13683500.2019.157472

Govt. of India - Yes Bank (2017). Sustainable Tourism in India: Initiatives and Opportunities. Confederation of India Industry and Yes Bank of India: 1-59.

Hidayat et. al. (2017). Challenges for Tourism Infrastructure Development in West Sumatra Province of Indonesia. *International Journal of Civil Engineering and Technology*, 8(10) : 1009–1016.

Jamil and Paud. (2010). Challenges in managing infrastructure for Urban Tourism: A comparative study of three Asian Cities. WIT Transactions on Ecology and Environment, vol (142), 243-253.

Kadi.K and Suklabaidya.P (2014). An Empirical Analysis of Wine Tourists Perspective on Tourism Infrastructure in Wine Regions of Maharashtra. Atna Journal of Tourism Studies, 9(2), 23-43.

Khadaroo, J. and Seetanah, B. (2007). Transport Infrastructure and Tourism Development. *Annals of Tourism Research,* 34(4) : 1021–1032.

Khan and Dong (2017).Travel and tourism competitiveness index: The impact of air transportation, railways transportation, travel and transport services on international inbound and outbound tourism. *Journal of Air Transport Management*, (58) : 125-134.

Mandić, A., Mrnjavac, Z. and Kordić, L. (2018). Tourism Infrastructure, Recreational Facilities and Tourism Development. Tourism and hospitality management, 24(1), 41-62.

Ministry of Tourism- Ontario (2009). Ontario Tourism Infrastructure Research Study. Ministry of Tourism Ontario Competitiveness Study prepared by Malone Given Pearson's Limited and HDR Decision Economics, *Queen Printer for Ontario,* 1-300.

Minyu. (2016). Research on the Impact of Infrastructure Construction on Tourism Industry: Evidences from the "Wuhan –Guangzhou" High Speed Rail. Open Journal of Social Sciences, (4): 126-31.

Mishra, K. P., Rout, B. M., and Mohapatra, S. S. (2011). Causality between Tourism and Economic Growth: Empirical Evidence from India. *European Journal of Social Sciences*, 18(4) : 518-27.

Navickas, V. and Malakauskaite, A. (2009). The Possibilities for the Identification and Evaluation of Tourism Sector Competitiveness Factors. Engineering Economics, 1(61) : 37-44.

Panasiuk, A. (2007). Tourism Infrastructure as a Determinant of Regional Development. Ekonomika ir Vadyba: aktualijos ir perspektyvos, 1(8), 212-15.

Ramjit, M. (2015). Sustainable Regional Development through Rural Tourism in Jammu and Kashmir. *Africa Journal of Hospitality, Tourism and Leisure*, 4(2), 1-16.

Rani, H. Afifudin, M. and Akbar, H. (2017). Tourism infrastructure development prioritization in Sabang Island using analytic network process methods. Proceedings of the 3rd International Conference on Construction and Building Engineering (Iconbuild) 2017: Smart Construction towards Global Challenges, 1903(1), 1-5.

Samer, R., Yiu, L. and Filature, M. (2015). Tourism Development in Least Developed Countries: Challenges and Opportunities. Handbook of Research and Global Hospitality and Tourism Management, IGI Global Publication Hershey, Penn. 2015, Chapter. 13: 234-61.

Seetanah and Juwaheer. (2011). Does Infrastructure Matter in Tourism Development? *University of Mauritius Research Journal.* (17) : 89-108.

Seetanah and Padachi. (2016). Soft Infrastructure in Tourism Development. The 2016International Academic Research Conference in Milan, 342-72.

Sharpley, R. (2000). Tourism and Sustainable Development: Exploring theTheoretical Divide. *Journal of Sustainable Tourism,* 8(1) : 1-9.

Silva, J. and Emily, W. (2017). Ecosystems as infrastructure. Perspectives in Ecology and Conservation, 15(1) : 32-35.

Sonja and Ivana (2016). Infrastructure as Important Determinant of Tourism Development in the Countries of Southeast Europe. ECOFORUM, 5(1). (8), 288-94.

Valichkina, A.V. (2014). The Assessment of the Regional Tourism Infrastructure Development. Economic and Social Changes: facts, trends, forecast, 2(3), 193-202.

Wan Lee, J. and Brahmaserene, T. (2012). Investigating the Influence of Tourism on Economic Growth and Carbon Emissions: Evidence from Panel Analysis of the European Union. Tourism Management, 38, 69-76.

Wei, L., & Ullah, S. (2022). International tourism, digital infrastructure, and CO2 emissions: fresh evidence from panel quantile regression approach. Environmental Science and Pollution Research, 29(24), 36273-36280.https://doi.org/10.1007/s11356-021-18138-2

Williams, S. (1998). Costs or benefits? The physical and economic development of tourism. Tourism Geography, Rutledge Contemporary Human Geography Series, Rutledge 29 West 35th Street, New York, NY 10001: 1-212.

World Bank. (1994). Infrastructure for Development. World Development Report-IBRD, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

Yousf, T. and Ali, M. (2018). Tourist Satisfaction, Environmental Concerns and Tourism Beyond Dal Lake, Kashmir. *Journal of Tourism and Hospitality,* (7)(2), 1-7.

Buhr, W. (2003). What is Infrastructure? Volkswirtschaftliche Diskussions beitrage, 2003, no. 107-03. Retrieved 10 Dec 2021 from http://www.wiwi.uni- siegen.de.

Mello, D. C., Kamat, K., Scaglione, M., Weirmeir, K., Pah, G. J. & Pillai, B. K. S. (2016). Assessing Tourism Infrastructure in Goa: A GAP Analysis. The 65th AIEST Conference on "Advances in Tourism Research: Perspectives of Actors, Institutions, and Systems, Lijiang, Peoples Republic of China, 24-28 August, 2015.

OECD. (2014). Climate-resilient Infrastructure. Oecd Environment Policy Paper 14-(IPPC-2018).

Donaubauer, J., Meyer, B. & Peter, N. (2014). A New Global Index of Infrastructure: Construction, Rankings and Applications. Kiel Institute for the World Economy, Kiellinie, 66 (24105), 1-38.

Sahminan, S., Hermansyah, O., & Rakhman, N. R. (2019). Construction of infrastructure index for Indonesia. *Studies in Economics and Finance,* 38(2), 173-188.

Rehman, A. S., Qianli, D., Songbo, W., Zaman, K. & Zhang, and Y. (2017) .Travel and tourism competitiveness index: The impact of air transportation, railways transportation, travel and transport services on international inbound and outbound tourism. *Journal of Air Transport Management,* 58,125-134.

Rehman, F. U., & Noman, A. A. (2020). Does infrastructure promote exports and foreign direct investment in selected Southeast Asian economies? An application of global infrastructure index. *Journal of Economic Studies.*

Gongmei, Y., Schwartz, Z. & John, E.W. (2009). A weather-resolving index for assessing the impact of climate change on tourism related climate resources. *Climatic Change*, (95), 551–573.

Ciacci, A., Ivaldi, E., Mangano, S., & Ugolini, G. M. (2021). Environment, logistics and infrastructure: the three dimensions of influence of Italian coastal tourism. *Journal of Sustainable Tourism*, 1-21.