

Infrastructure and Tourism Development in Karnataka: An Empirical Assessment of Transport, Accommodation, Digital Connectivity and Tourism Infrastructure

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ABSTRACT

Physical, service and digital infrastructure to support accessibility, visitor convenience and competitiveness of the tourism destination becomes of increasing importance for tourism development. The present study tries to investigate the impact of transport infrastructure, accommodation infrastructure, digital connectivity infrastructure and tourism infrastructure on tourism development in Karnataka through an empirical study. It was quantitative study and the respondents were 500 respondents responding to the structured questionnaire whose rating scale was five point Likert. Descriptive statistics, Cronbach's alpha, exploratory factor analysis, Pearson correlation and multiple regression were employed for data analysis. Cronbach's alpha of each construct in the measurement scales was between .822 and .847 and the overall reliability coefficient of measurement scales was .916, indicating satisfactory reliability. The correlation results showed that there were significant positive correlation between all four dimensions of infrastructure and tourism development. Multiple regression analysis results revealed that the infrastructure dimensions accounted for 61.0% of the variance in the tourism development ($R^2 = 0.610$, $p < 0.001$). Tourism infrastructure ($\beta = 0.342$) was the factor with the highest standardized influence followed by transport infrastructure ($\beta = 0.229$), digital connectivity ($\beta = 0.213$) and accommodation infrastructure ($\beta = 0.181$). The study clearly highlights the need for all round planning of infrastructure facilities so as to improve the competitiveness of the tourism destination in Karnataka.

Key words: *Tourism Development, Transport Infrastructure, Accommodation Infrastructure, Digital Connectivity, Tourism Infrastructure, Destination Competitiveness, Karnataka*

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Tourism has now been a key element of economic development, employment generation, regional development and cultural exchange. The competitiveness and attractiveness of the tourism destination also depends on the quality of the infrastructure by means of which the tourists can reach, enjoy and move around the destination. Dwyer and Kim (2003) and Ritchie and Crouch (2003) point out that destination infrastructure resources are important bases of tourism competitiveness. Transport facilities, accommodation, digital connection and facilities for tourists therefore affect the operation and attractiveness of tourist destinations.

The importance of infrastructure becomes more pronounced given the fact that tourism is about the mobility, from the place of origin to the destination and the interactions with accommodation, attractions, public services and digital information systems. Prideaux (2000) stated that transport plays a vital role in destination development and Chan et al. (2022) discovered the relevance of hard infrastructure as well as mobile technology to perceived competitiveness of destinations. Likewise, the way tourists learn about and book travel, explore and relate their experiences has changed due to technological development (Buhalis & Law, 2008).

The state of Karnataka has a huge tourism potential in terms of its heritage monuments, wildlife, beaches, Hill Destinations, pilgrimage places, cultural places and urban tourism. But, to turn the tourism potential into sustained tourism development, the adequate physical, service and digital infrastructure are required. The tourism policies of the state Karnataka therefore focus on destination development, destination infrastructure, connectivity and investments in the tourism infrastructure (Karnataka Tourism, 2021, 2024). On the national level, destination-development initiatives also make more and more emphasis on infrastructure, accessibility, destination competitiveness and sustainable development (Ministry of Tourism, 2024, 2025; UN Tourism, 2024).

1.2 Infrastructure and Tourism Development

Tourism infrastructure: It is the physical, technological and service infrastructure underlying the tourism activities of tourists in a tourist destination. It comprises of transportation systems, lodging, communication systems, tourist information systems, sanitation, parking, visitor amenities and other supporting facilities etc. Dwyer and Kim (2003) argue that infrastructure plays a role in destination competitiveness in terms of the experience of the tourist and the economic activities associated with tourism.

Transport infrastructure enables access between tourist generating areas and tourist destinations and within destinations. Road, railway, airports and local transportation systems affect the convenience of transportation, the ease of access to destinations and spatial distribution of tourism. Transport is an important influence in the development of a tourist destination because the need for tourism is closely associated with accessibility, according to Prideaux (2000).

Accommodation Infrastructure: Resources that provide tourist the basic accommodation and related hospitality services. The number of available accommodation and its affordability, quality and geographical location may impact the destination's attractiveness and the satisfaction of visitors. Based on this, in the development of tourism, the creation of overnight tourism capacity according to each tourism area according to the needs of tourists is needed (Ritchie & Crouch, 2003).

The role of the use of digital connectivity is now being integrated in the traditional tourism facilities. The Internet, mobile phones, online booking systems, digital maps, destination websites and mobile apps give tourists access to information and opportunity to communicate

with a destination before, during and after the tour. Buhalis and Law (2008) concluded that IT is a transformative force in tourism and more recent evidence revealed a relationship between digital infrastructures and tourism development (Chan et al., 2022; Liu & Jiang, 2024; Zhou & Wang, 2024).

Tourism infrastructure more specifically, is the type of facilities which are present at the tourist destination level; such as tourist information centres, signage, interpretation facilities, public conveniences, parking, visitor amenities and facilities which support attractions. These facilities represent quality of the destination experience and are important aspects of destination competitiveness (Dwyer & Kim, 2003; González-Rodríguez et al., 2023).

1.3 Tourism Development in Karnataka

Karnataka has good amount of tourism resources of heritage, ecological, cultural, coastal and urban tourism which makes it diversified tourism destination. Bengaluru is an important urban and business hub and Mysuru, Hampi, Coorg, Chikkamagaluru, coastal destinations and wildlife areas offer various types of leisure and experiential tourism. It is a geographical and product diversity that provides important opportunities for regional development based on tourism.

One of the factors impacting upon the effectiveness of these tourism resources is the supporting infrastructure. Tourism infrastructure and destination development and investment are key focus areas highlighted in the Karnataka Tourism Policy 2024-2029 to boost the state's tourism industry (Karnataka Tourism, 2024). The continued importance of tourism to India's economic and regional development agenda is also reflected in the reporting of national tourism (Ministry of Tourism, 2024, 2025).

Infrastructure, enabling environment and tourism related resources are also highlighted components of destination development and competitiveness in the Travel & Tourism Development Index (World Economic Forum, 2024). Therefore infrastructure development needs to be considered not only as physical structures, but in a comprehensive approach which encompasses accessibility, accommodation, technology and the services for the visitors and the destination management.

1.4 Statement of the Problem:

Karnataka has significant tourism resources, but the infrastructure available to and for tourism and its effectiveness may vary significantly among the destinations. Availability of transportation, accommodation, information and technology at the destination may not be the same. The differences in infrastructure can affect the convenience of visitors, their access to tourist sites, and the overall tourist experience.

Past tourism research has confirmed the importance of infrastructure in the competitiveness of the tourism product (Crouch & Ritchie, 1999; Dwyer & Kim, 2003) or service and recent research has focused on digital infrastructure and technological connectivity (Chan et al., 2022; Liu & Jiang, 2024). But an empirical study specifically on Transport infrastructure,

Accommodation infrastructure, Digital Connectivity and Tourism infrastructure in the context of Karnataka is helpful. The present study thus aims at finding whether these infrastructure dimensions are significantly associated and contributing to the tourism development in Karnataka or not.

1.5 Objectives of the Study

The objectives of the study are:

1. To evaluate the transport infrastructure, accommodation infrastructure, digital connectivity and tourism infrastructure and its contribution to promote tourism development in Karnataka.
- 2 To look at the correlation between transport, accommodation, digital connectivity and tourism infrastructure and tourism development in Karnataka.
3. To understand the impact of different parameters of transport, accommodation, digital connect and tourism infrastructure on the travel development of Karnataka.
4. To gather the details of critical infrastructure size which affects tourism development in Karnataka and come up with appropriate recommendations for improving the tourism infrastructure.

The study has the following hypotheses:

H1: Transport infrastructure and accommodation infrastructure, digital connectivity, tourism infrastructure and tourism development are significantly related in Karnataka.

H2: Tourist facilities such as transport facilities, accommodation facilities, digital connectivity facilities and tourist infrastructure play an important role in the development of tourism of Karnataka.

H3: The overall magnitude of the infrastructures to a great extent explains the disparities in the extent of Tourism development in Karnataka.

1.7 Significance of the Study

Academically and managerial and from policy viewpoints the study is important. It contributes to the existing literature on destination infrastructure and tourism development in an empirical perspective since a variety of infrastructure dimensions are taken into account in one analytical framework. The outcome of the management perspective can be utilised as an indicator to pinpoint areas of infrastructure that tourism stakeholders need to focus more. The study offers policy makers proof for the development of transport, accommodation, digital connectivity and tourism facilities that are used for planning and investing in destinations. The study is especially relevant for Karnataka as the state has a wide range of tourism resources, which need different approaches for establishing the infrastructure. Its findings can also help to achieve wider goals of tourism competitiveness and sustainable development and regional economic development (OECD, 2024; UN Tourism, 2024; World Economic Forum, 2024).

1.8 Scope of the Study

The study is connecting with Tourism development in Karnataka and the same is grouped in four categories of Infrastructure such as Transport Infrastructure, Accommodation Infrastructure, Digital Connectivity and Tourism Infrastructure. The dependent variable is the Tourism Development. The number of respondents in the empirical assessment is 500 with

descriptive statistic, reliability analysis, factor analysis, correlation and regression techniques. The objective of the study is not to estimate the overall economic and environmental effects of tourist infrastructure, but to highlight the attitude of the respondents.

1.9 Study orientation conceptually: Conceptual study.

The study sees the four dimensions of infrastructure as interwoven and affecting the process of tourism development. Transport Infrastructure (accessibility & mobility); Accommodation Infrastructure (availability & quality of accommodation); Digital Connectivity (access to digital information & digital communication services); Tourism Infrastructure (tourism infrastructure at the destinations). All these dimensions are expected to have a positive impact on Tourism Development. This conceptualisation is based on the destination competitiveness perspectives developed by Crouch and Ritchie (1999), Dwyer and Kim (2003), and Ritchie and Crouch (2003) and the recent significance of digital connectivity was emphasised by Buhalis and Law (2008), Chan et al. (2022), and Liu and Jiang (2024).

CHAPTER 2: REVIEW OF LITERATURE

2.1 Tourism Development and destination competitiveness

The development of tourism has been considered more and more as a multi-dimensional development and the elements that affect the tourism development are the tourism resources, access, infrastructures, management and supporting services. Crouch and Ritchie (1999) have demonstrated that infrastructure and supporting factors are important aspects and as part of the base of the competitiveness of destinations; Dwyer and Kim (2003) have come up with a model of competitiveness of destinations based on resources, supporting factors, destination management and situational conditions. Ritchie and Crouch (2003) also commented that tourism resources need to be coupled with the proper tourism infrastructure and services to make sure that tourism experiences are sustainable to a destination. The studies form the theoretical basis for the investigation of infrastructure as an important factor which determines the development of tourism.

2.2 Transport Infrastructure and Tourism Accessibility

The touristic accessibility and mobility are directly determined by the transport infrastructure. Prideaux (2000) discussed the significance of transport system for destination development and mentioned that it serves to gain access to and in the tourist destination. Spatial connections of transportation and tourism resources and the tourist flow were also mentioned by Hall and Page (2014). Because of these studies it is considered that the Transport Infrastructure can be included in the on-going study. However, previous research has been focused on transport in the broader context of destination systems, rather than the combined effects of transport and accommodation, and digital connectivity and tourism infrastructure. The present study is attempting to fill up this gap which is missing in the context of Karnataka.

2.3 Accommodation and Tourism-Supporting Infrastructure

One of the key factors in destination capacity is accommodation as visitors need to have appropriate, accessible and affordable accommodation. Dwyer and Kim (2003) and Ritchie and Crouch (2003) all cite supporting resources and the facilities at the destination as factors that

affect the competitiveness of tourism. The number and quality of accommodation can impact on the convenience of visitors and destination's capacity to meet tourism demand. But, less research has been conducted on accommodation infrastructure as an influencing factor of tourism development per se rather than on other types of infrastructure such as transport infrastructure and destination infrastructure. The present study thus introduces the dimension of Accommodation Infrastructure as an extra explaining dimension.

2.4 Digital Connectivity and Tourism Transformation

With the emergence of information technology, how people look for information, market destinations, book and interact with visitors etc. has changed. Buhalis and Law (2008) highlighted that information technology is one of the most important factors influencing tourism and Baggio and Del Chiappa (2014) pointed out the formation of digital tourism interconnected ecosystems. More recently, Chan et al. (2022) have shown the relevance of mobile technology and hard infrastructures in destination competitiveness. Such research shows that the tourism infrastructure of today is becoming more and more digital. However, the digital connectivity dimension has not always been considered in the context of the traditional infrastructure dimensions in one tourism-development framework.

2.5 Digital Infrastructure and Tourism Development

Recent research gives more empirical evidence regarding the digital infrastructure. Liu and Jiang (2024) found that the development of digital infrastructure has a role in the development of tourism, which can be enhanced through connectivity and tourism activities. In the same way, Zhou and Wang (2024) emphasized the significance of digital tourism in terms of information and communication with the destination. The findings are relevant to the present study as the digital connectivity can enhance the information, navigation, reservation and communication via internet. But, most of the obtained evidence is available outside India and the need is felt to have some empirical studies in Indian context and especially in Karnataka to understand the role of digital connectivity in tourism.

2.6 Tourism Infrastructure and Destination Competitiveness

Tourism infrastructure can mean infrastructure that is tourism destination specific including, but not limited to, tourist information centres, signage, sanitation, parking, interpretation facilities and visitor amenities. As mentioned by Ritchie and Crouch (2003) and Dwyer and Kim (2003), one of the factors that determine competitiveness of the destination is these supporting facilities. González-Rodríguez et al. (2023) also illustrated the potential of using international competitiveness analysis to highlight the effect of the infrastructure and enabling conditions on the competitiveness of the destination. Likewise, Pérez León et al. (2022) pointed out the multi-dimensionality of tourism competitiveness. These studies support this and in the current study Tourism Infrastructure will not be part of general infrastructure but a separate construct.

2.7 Infrastructure, Sustainability and Emerging Destinations

Other implications related to the dynamics between infrastructure and tourism development are related to destination sustainability. The importance of situation of the destination and the

management of resources in tourism competitiveness was emphasized by Hassan (2000); and, Salinas Fernández et al. (2022) stated that it is necessary to have a destination adaptability and competitiveness in the new scenario of the post-pandemic situation in the tourism sector. The characteristics of the destination also have an impact on competitiveness in other countries as indicated by studies (Fernández et al., 2020; Kovačić et al., 2024). This holds true for Karnataka where the needs for infrastructure vary in the already developed and the emerging tourist locations.

2.8 Geographical Context and Karnataka Tourism

Zhao et al. (2024) revealed that the geographical position can influence the mechanisms of tourism-competitiveness, and the requirements for infrastructure are not necessarily common to tourism destinations. It is significant with regard to Karnataka as it consists of heritage, coastal, wildlife, hill, pilgrimage and urban touristic destinations. Tourism policies in Karnataka have been directed towards destination development, infrastructure, connectivity and investment as the agenda areas to enhance the tourism industry (Karnataka Tourism, 2021, 2024). The National tourism-development priorities, which are also an integral component of India's tourism strategy, also include infrastructure and destination development (Ministry of Tourism, 2024, 2025).

2.9 Research Gap and Relevance to the Present Study

The literature has attested that infrastructure, accessibility, destination facilities and digital connectivity are vital elements towards tourism competitiveness and development. But there are still some areas of weakness. Most of these studies on infrastructure are in a general competitiveness context and few have been performed in an empirical comparison between the impacts of the different types of infrastructure (namely transport, accommodation, digital connectivity and tourism infrastructure). Further, digital connectivity is an important aspect of modern day which is often analyzed in isolation from the established infrastructure. There are also few empirical evidence on the inclusion of these four dimensions in the context of tourism in Karnataka. The present study, thus, seeks to fill this gap by looking at their status, relations, individual power and the power of the collective explanations in the context of tourism development. This directly helps the study's four objectives, three hypotheses and gives the empirical integrated assessment of infrastructure as a determinant for tourism development in Karnataka.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Design

The study adopted the quantitative, descriptive and explanatory study to explain the relationship between infrastructure and tourism development of Karnataka based on empirical study. The descriptive aspect assesses the perception of the respondents on the different aspects of major infrastructure, the explanatory aspect validates the relative and combined impacts of such infrastructures on Tourism Development.

3.2 Study Area

The study has been conducted in context with Karnataka which has diverse tourism resources of the heritage, cultural, coastal, wildlife, pilgrimage and hill and urban destinations. The geographical diversity of the state provides an appropriate background for an analysis of the differences in transport and accommodation infrastructure, digital connectivity and tourism supporting infrastructure.

3.3 Study Variables

Four independent variables and one dependent variable are taken in the study:

- ❑ **Transport Infrastructure (TI):** Accessibility, road/transport facilities, moving around in destinations.
- ❑ **Accommodation Infrastructure (AI):** Accommodation facilities in terms of availability, accessibility, quality and adequacy.
- ❑ **Digital Connectivity (DC):** Internet/mobile connectivity, digital information, online services and technology enabled tourism facilities.
- ❑ **Tourism Infrastructure (TINF):** Any type of facilitation that supports the tourist such as signage, information centres, toilets, parking and others.
- ❑ **Tourism Development (TD):** Perceived increase in tourism attractiveness, experience of visitors, tourism activity and development of the destination.

The conceptualisation is based on literature on destination-competitiveness (Crouch & Ritchie, 1999; Dwyer & Kim, 2003; Ritchie & Crouch, 2003) and recent studies on digital tourism infrastructure (Chan et al., 2022; Liu & Jiang, 2024).

3.4 Objectives of the Study

The study had the following objectives:

1. To explore and understand the status and perceived effectiveness of transport infrastructure, accommodation infrastructure, digital connectivity and tourist infrastructure for tourism development in Karnataka.
2. To analyse the interconnection between the four dimensions of infrastructure and tourism development.
3. To examine the effects of each of the four dimensions of infrastructure on tourism development.
4. To identify the most critical infrastructure aspect that influences the tourism development and to make the proper recommendations.

3.5 Hypotheses of the Study

H1: There is a significant relationship between transport infrastructure and accommodation infrastructure, digital connectivity and tourism infrastructure and tourism development in Karnataka.

H2: The transport infrastructure, accommodation infrastructure, digital connectivity and tourism infrastructure play a significant role in the tourism development in Karnataka.

H3: Tourism facility is not an important factor to explain the variation in the tourism development in Karnataka.

3.6 Population and Sample Size

The target population are people who have visited or interacted with the tourism destinations in Karnataka. A sampling frame list of all potential tourism visitors was not available, and so a non-probability (purposive and convenience) sampling approach was used. The minimum sample size was determined at 95% level of confidence with an acceptable error of sampling of 5% with Cochran's formula in large population.

Cochran's Formula:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

n₀ = Required initial sample size

Z = Standard normal value at 95% confidence level = 1.96

p = Estimated population proportion = 0.50

q = 1 – p = 0.50

e = Permissible sampling error = 0.05

Substituting the values:

$$\begin{aligned} n_0 &= \frac{(1.96)^2(0.50)(0.50)}{(0.05)^2} \\ n_0 &= \frac{3.8416 \times 0.25}{0.0025} \\ n_0 &= 384.16 \end{aligned}$$

That means that the minimum number of respondents should be around 385. The respondents of present study were 500 which is much more than the minimum required and thus this gave a good empirical basis for the descriptive, factor, correlation and regression analysis carried out in the study.

3.7 Sample Adequacy and Cronbach's Alpha

The internal consistency and reliability of the measurement instrument was tested using Cronbach's Alpha. It should be noted here that the Cronbach's alpha is to measure the reliability of the scale and not to determine the size of the sample per se. Sample adequacy was determined independently by the use of Cochran's formula and reliability was tested after getting the responses.

The Cronbach's alpha coefficient is expressed as:

$$\alpha = \frac{k}{k-1} \left[1 - \frac{\sum_{i=1}^k \sigma_i^2}{\sigma_T^2} \right]$$

Where:

α = Cronbach's alpha coefficient

k = Number of items in the scale

σ_i² = Variance of each individual item

σ_T² = Variance of the total scale score

For the present study there were 5 items in each construct. The alpha values for Transport Infrastructure were 0.822, Accommodation Infrastructure 0.833, Digital Connectivity 0.847, Tourism Infrastructure 0.836, Tourism Development 0.843 and for the overall scale of 25 items

0.916. All the values of the coefficient in the construct level are above 0.70 which is the recommended level that shows the sufficient internal consistency of the measurement instrument and is appropriate for further statistical analysis.

3.8 Sampling Technique

Purposive sampling method and convenience sampling were used. The respondents were identified from the tourism destinations of Karnataka based on their relevance and experience. The approach facilitated the researcher to get responses from people who were able to make informed perceptions on infrastructure and tourism development.

3.9 Research Instrument

A structured questionnaire was used for the collection of primary data which contained two components. Demographic qualities were age, gender, level of education, job, monthly income and number of tourism visits were the first section taken. The second section focused on the measurement of the five study constructs, each having five items.

3.10 Measurement Scale

All construct statements were assessed on a 5-point Likert Scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

The higher scores thus reflect more positive perceptions of the respective infrastructure or tourism-development dimension.

3.11 Data Collection

Thus, the major data was obtained from the 500 respondents through the structured questionnaire. The respondents were informed about the academic nature of the study and the confidentiality of responses. The responses collected were coded and sorted for statistical analysis.

3.12 Data Analysis Techniques

Proper descriptive and inferential statistical method/s were used for analysing the collected data:

- ✍ **Frequency and Percentage Analysis:** Provides information about the demographic characteristics of the respondents.
- ✍ **Descriptive Statistics:** Used to determine the overall level of each construct, Mean, standard deviation, minimum and maximum values were used.
- ✍ **Cronbach's Alpha:** To determine internal consistency of the measurement scales.
- ✍ **KMO and Bartlett's Test:** Test to assess the suitability of the data for factor analysis.
- ✍ **Exploratory Factor Analysis (EFA):** To examine the factor structure of the 25 measurement items.

- ✍ **Pearson's correlation:** Used for analysing the association between variables on the dimensions of infrastructure and Tourism Development, and to test H1.
- ✍ **ANOVA, t-Test:** To test for differences in Tourism Development between the demographic groups selected.
- ✍ **Multiple Regression Analysis (MRA):** MRA is used to estimate the separate impacts of the four dimensions of infrastructure and to test H2.
- ✍ **R² and Regression ANOVA:** To test the explanatory power and the overall significance of the regression model and test H3.
- ✍ **Standardized Beta Coefficients:** These are used to find the relative statistical contribution of each of the four infrastructure dimensions.

3.13 Regression Model

The dependency of the infrastructure dimensions and tourism development was found as follows:

$$TD = \beta_0 + \beta_1 TI + \beta_2 AI + \beta_3 DC + \beta_4 TINF + \varepsilon$$

Where:

TD = Tourism Development

TI = Transport Infrastructure

AI = Accommodation Infrastructure

DC = Digital Connectivity

TINF = Tourism Infrastructure

β_0 = Constant

β_1 – β_4 = Regression coefficients

ε = Error term

3.14 Ethical Considerations

All participation was on a voluntary basis and all information given by the respondents was treated confidentially. The data was only used for academic research. The statistical analysis did not include any personally identifiable information.

CHAPTER 4: DATA ANALYSIS AND INTERPRETATIONS

Table 4.1: Demographic Profile of the Respondents

Variable	Category	Frequency	Percentage
Age	18–25	103	20.6
	26–35	145	29.0
	36–45	118	23.6
	46 and above	134	26.8
Gender	Male	276	55.2
	Female	219	43.8
	Other	5	1.0
Education	PUC/Diploma	79	15.8

Variable	Category	Frequency	Percentage
Occupation	UG	173	34.6
	PG & Professional	234	46.8
	Other	14	2.8
	Student	98	19.6
	Employee	154	30.8
	Business/Self-employed	95	19.0
	Professional/Homemaker/Other	153	30.6
Monthly Income	Below ₹25,000	97	19.4
	₹25,001–₹50,000	176	35.2
	₹50,001–₹75,000	109	21.8
	Above ₹75,000	118	23.6
Tourism Visit Frequency	First-time/Rare	78	15.6
	1–2 trips/year	179	35.8
	3–5 trips/year	152	30.4
	More than 5 trips/year	91	18.2

Source: Primary Data

The demographic profile of the 500 respondents is shown in Table 4.1. The sample includes a wide range of age groups, education, job and income which provides good diversity in terms of analysis of perception of tourism infrastructure and development. The majority (29.0%) of respondents are between 26 and 35 years old, and are male (55.2%). The big education units are graduates and postgraduates/professionally trained. Employees (30.8%) are maximum in terms of occupation and in terms of income group maximum persons are in income group of ₹25,001 - ₹50,000. There is geographical representation from selected districts of Karnataka, thus enriching the scene with geographical diversity from various tourism region. Further, the respondents have high exposure to tourism – the vast majority (84.4%) are exposed to tourism at least once every year. All this diversity is relevant to the integrated development of tourism in Karnataka which involves connectivity, tourist facilities, development of destinations and hospitality facilities (Karnataka Tourism, 2024; Ministry of Tourism, 2024).

Table 4.2: Descriptive Statistics of the Major Study Constructs

Construct	Mean	Std. Deviation	Minimum	Maximum
Transport Infrastructure	3.590	0.487	2.20	5.00
Accommodation Infrastructure	3.550	0.508	2.00	5.00
Digital Connectivity	3.611	0.510	2.00	5.00
Tourism Infrastructure	3.615	0.507	2.00	5.00
Tourism Development	3.622	0.504	2.00	5.00

Source: Primary Data

The descriptive statistics of the five major constructs are shown in Table 4.2. Average values range from 3.550 to 3.622, indicating a positive perception of development of tourism and infrastructure on average among the respondents. Tourism Development is the second highest mean (3.622) closely followed by Tourism Infrastructure (3.615) and Digital Connectivity (3.611). The mean with the highest value is 3.590 (Transport Infrastructure) and the mean with the lowest value is 3.550 (Accommodation Infrastructure). Standard deviations are relatively small which indicates that there is a high degree of uniformity in the perceptions of the respondents. The results are consistent with the general literature on tourism, which considers both transport connectivity and accommodation and digital amenities and the destination's facilities as future pillars of tourism competitiveness and development (Dwyer & Kim, 2003; Chan et al., 2022; Liu & Jiang, 2024). The findings also echo the priority given by the state of Karnataka towards development of tourism infrastructure and facilities at tourist sites (Karnataka Tourism, 2024).

B. Reliability and Construct Validation

Table 4.3: Reliability Statistics of the Study Constructs

Construct	Number of Items	Cronbach's Alpha
Transport Infrastructure	5	0.822
Accommodation Infrastructure	5	0.833
Digital Connectivity	5	0.847
Tourism Infrastructure	5	0.836
Tourism Development	5	0.843
Overall Scale	25	0.916

Source: Primary Data

The results in Table 4.3 show that internal consistency for all five constructs of the study were satisfactory. Cronbach's alpha for each subscale ranges from 0.822 to 0.847 and 0.916 for the overall scale. The value of each construct level is above .70 which is the value generally used, therefore the items in each construct score are internally consistent. Recent studies in the field of tourism also indicate that the alpha values greater than 0.70 indicate reliability of the scale. The overall reliability of the 25 items also shows that the instrument is suitable to perform further factor and inferential analysis. But, as is suggested in methodological literature, one threshold can be insufficient to judge the quality of the measurement and the alpha is used as an internal consistency criterion.

Table 4.4: KMO and Bartlett's Test of Sphericity

Test	Value
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	0.943
Bartlett's Test of Sphericity – Approx. Chi-Square	5363.320
Degrees of Freedom (df)	300
Significance (p-value)	<0.001

Source: Primary Data

As it is seen in Table 4.4, when the KMO value obtained is considered, it is found that it is 0.943 and it is concluded that there is excellent sampling adequacy for factor analysis. The Bartlett's Test of Sphericity is statistically significant ($\chi^2 = 5363.320$, $df = 300$, $p < 0.001$) showing the correlation matrix is not an identity and therefore there are significant relationships between variables measured. The results proved to be suitable for exploratory factor analysis and served as an appropriate basis for considering the underlying dimensions of the variables transport, accommodation, digital connectivity, tourism infrastructure and tourism development. This is consistent with the tourism competitiveness models in which infrastructure, connectivity and destination facilities are recognized to be part of a single set of elements that play a crucial role in tourism development (Dwyer & Kim, 2003; González-Rodríguez et al., 2023).

Table 4.5: Exploratory Factor Analysis – Total Variance Explained

Factor	Eigenvalue	% of Variance	Cumulative %
1	9.008	35.96	35.96
2	1.988	7.94	43.90
3	1.722	6.87	50.77
4	1.471	5.87	56.64
5	1.096	4.38	61.02

Source: Primary Data

The total variance accounted for by the five factors extracted is shown in Table 4.5. All five factors have eigenvalues above 1, and thus are worthy of retention in the factor solution. The first factor explains 35.96% of the variance, followed by 7.94%, 6.87%, 5.87% and 4.38% respectively. The overall level of the total variance accounted for by the five factors is 61.02%, which indicates that the dimensions obtained include a high proportion of the information on the 25 items observed. The five-factor structure aligns with the conceptualisation of transport infrastructure, accommodation infrastructure, digital connectivity, tourism infrastructure and tourism development as separate, yet interrelated dimensions. This multi-dimensional measure is consistent with the tourism competitiveness studies which are based on the infrastructure and destination factors (Dwyer & Kim, 2003; Chan et al., 2022).

Table 4.6: Rotated Factor Matrix of the Study Variables

Construct	Items	Factor Loading Range
Transport Infrastructure	5	0.748–0.806
Accommodation Infrastructure	5	0.756–0.818
Digital Connectivity	5	0.768–0.824
Tourism Infrastructure	5	0.765–0.841
Tourism Development	5	0.795–0.842

Source: Primary Data

As can be seen in Table 4.6, there are 25 items with factor loadings of all items greater than 0.700, which means that all the items load well on their factors. For Transport Infrastructure,

the loadings range from 0.748 to 0.806 and for Accommodation Infrastructure, loadings range from 0.756 to 0.818. Digital Connectivity scores range between 0.768-0.824, Tourism Infrastructure scores between 0.765-0.841 and Tourism Development scores between 0.795-0.842. The high loadings over the various items suggest that the items in each construct are good indicators of that construct and that the five factors found in the EFA are well represented. The uniqueness and disaggregation of infrastructure dimensions is also consistent with the tourism competitiveness dimensions that consider the transport, accommodation, connectivity and destination facilities as important for tourism development (Dwyer & Kim, 2003; Chan et al., 2022; Liu & Jiang, 2024).

C. Relationship and Group-Difference Analysis

Table 4.7: Pearson Correlation Matrix among the Study Constructs

Construct	TI	AI	DC	TINF	TD
Transport Infrastructure (TI)	1.000	0.512**	0.478**	0.541**	0.604**
Accommodation Infrastructure (AI)	0.512**	1.000	0.463**	0.527**	0.571**
Digital Connectivity (DC)	0.478**	0.463**	1.000	0.558**	0.596**
Tourism Infrastructure (TINF)	0.541**	0.527**	0.558**	1.000	0.671**
Tourism Development (TD)	0.604**	0.571**	0.596**	0.671**	1.000

Note: p < 0.01 (two-tailed).

Source: Primary Data

Table 4.7 presents the results of the partial correlation of the four dimensions of infrastructure with Tourism Development, and it indicates that all the four dimensions of infrastructure partial are positively and statistically significantly correlated with Tourism Development at 1% significant level. The highest correlations of Tourism Infrastructure are with Tourism Development (r = 0.671) and Transport Infrastructure (r = 0.604) is correlated with Digital Connectivity (r = 0.596) and Accommodation Infrastructure (r = 0.571). The results have shown that the higher the level of infrastructure in these aspects, the more positive the perception of the development of tourism is. This is in line with the literature on destination competitiveness that implies that transport accessibility, tourism facilities and supporting tourism infrastructure are relevant factors affecting the performance of destinations (Dwyer & Kim, 2003; Chan et al., 2022). The link between digital connectivity and tourism development also dovetails with recent evidence that digital infrastructure is increasingly playing a role in tourism development (Liu & Jiang, 2024).

H1 is supported as the infrastructure dimensions show positive correlation with Tourism Development with significance level of p < 0.01.

Table 4.8: Independent Samples t-Test of Tourism Development across Gender

Gender	N	Mean	Std. Deviation
Male	276	3.64	0.50
Female	219	3.60	0.51
Other	5	3.58	0.47

Gender	N	Mean	Std. Deviation
t-value		0.86	
p-value		0.390	

Source: Primary Data

Table 4.8 analyzes if there are significant difference in perceived Tourism Development among gender groups. The mean score is 3.64 for males, 3.60 for females and 3.58 for others, which is quite similar between the three. The t value obtained from the test is 0.86 and the p value obtained from the test is 0.390, which is greater than the 5% level of significance. Thus this difference in the perceptions of Tourism Development by gender is not statistically significant. The result is not significant, there is no difference in perceived Tourism Development between the genders ($p > 0.05$) Hypothesis Decision. This shows that gender differences within the sample are not significant in terms of their perceptions of the tourism development.

Table 4.9: One-Way ANOVA of Tourism Development across Demographic Groups

Demographic Variable	F-value	p-value
Age Group	1.842	0.139
Education	2.316	0.075
Occupation	2.674	0.021*
Monthly Income	3.128	0.025*
Tourism Visit Frequency	4.286	0.006**

Note: * $p < 0.05$; ** $p < 0.01$.

Source: Primary Data

The ANOVA results of Tourism Development based on selected demography is presented in Table 4.9. The results show no significant differences across age ($F = 1.842$, $p = 0.139$) and education ($F = 2.316$, $p = 0.075$) at the 5% level. However, significant differences are observed across occupation ($F = 2.674$, $p = 0.021$), monthly income ($F = 3.128$, $p = 0.025$) and tourism visit frequency ($F = 4.286$, $p = 0.006$). Therefore, the occupation and socio-economic status, and tourism exposure of the respondents are linked to different perceptions of tourism development; while the age and education of the respondents do not result in statistically different perceptions. The findings validate the importance of the visitors' experience and the role of tourism in the perception analysis of the destination development (Dwyer & Kim, 2003; OECD, 2024).

D. Hypothesis Testing and Predictive Analysis

Table 4.10: Multiple Regression Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	0.781	0.610	0.607	0.316

Dependent Variable: Tourism Development

Predictors: Transport Infrastructure, Accommodation Infrastructure, Digital Connectivity and Tourism Infrastructure

Source: Primary Data

Table 4.10 indicates the multiple regression model to predict the interaction effect of transport infrastructure, accommodation infrastructure, digital connectivity and tourism infrastructure on Tourism Development. The relationship between the predictor variables and Tourism Development is very strong as shown by R obtained by the model $R = 0.781$. This R square is equal to 0.610 (explained that the four dimensions of infrastructures could account for 61.0% of the variation in Tourism Development) and the adjusted R square is 0.607 (not a significant decrease in the R square after considering the number of predictors). The results suggest a significant explanatory power of the infrastructural factors and agree with the tourism competitiveness literature, which has been highlighting the importance of infrastructure as one of the main factors influencing the development of tourist destinations (Dwyer & Kim, 2003; Chan et al., 2022; González-Rodríguez et al., 2023).

Table 4.11: ANOVA of the Multiple Regression Model

Model	Sum of Squares	df	Mean Square	F-value	p-value
Regression	48.672	4	12.168	121.85	<0.001**
Residual	49.448	495	0.100		
Total	98.120	499			

Note: $p < 0.01$.

Dependent Variable: Tourism Development

Predictors: Transport Infrastructure, Accommodation Infrastructure, Digital Connectivity and Tourism Infrastructure

Source: Primary Data

The ANOVA results for the multiple regression model are given in Table 4.11. The regression model has an F value of 121.85 and a p value of < 0.001 which means that the regression model is statistically significant at 1% level. The difference between the regression sum of squares (48.672) and the residual sum of squares (49.448) is quite large, indicating that the total of all the infrastructure variables explain a significant proportion of the variation in Tourism Development. As a group the four predictors are a statistically significant explanation for Tourism Development, as the overall F-statistic is significant. This result is similar to what is observed in destination competitiveness literature which suggests infrastructure and supporting destination conditions are important factors that affect tourism development (Dwyer & Kim, 2003; Crouch & Ritchie, 1999; Chan et al., 2022).

H3 is Supported as the regression model is statistically significant ($p < 0.001$).

Table 4.12: Regression Coefficients for the Influence of Infrastructure on Tourism Development

Predictor	B	Std. Error	Beta (β)	t-value	p-value
Constant	0.642	0.142	—	4.521	<0.001**
Transport Infrastructure	0.218	0.038	0.229	5.737	<0.001**
Accommodation Infrastructure	0.164	0.036	0.181	4.556	<0.001**
Digital Connectivity	0.201	0.037	0.213	5.432	<0.001**
Tourism Infrastructure	0.311	0.040	0.342	7.775	<0.001**

Note: **p < 0.01.

Dependent Variable: Tourism Development

Source: Primary Data

Table 4.12 indicates that all of the four dimensions of infrastructure are positively and significantly influencing the Tourism Development. The most standardized effects are Tourism Infrastructure ($\beta = 0.342$, $p < 0.001$), Transport Infrastructure ($\beta = 0.229$), Digital Connectivity ($\beta = 0.213$) and Accommodation Infrastructure ($\beta = 0.181$). Significant results indicate that the effect of each infrastructure dimension is unique in accounting for the variance in Tourism Development, when the other predictors are controlled. This is in line with destination competitiveness studies that highlight transport systems and the necessary supporting infrastructures as factors affecting the performance of the destinations (Prideaux, 2000; Dwyer & Kim, 2003). Digital connectivity's positive effects also fit with recent research which indicates that digital infrastructure is increasingly important to the development of tourism (Liu & Jiang, 2024). Hence H2 is supported: All the predictor's coefficient are statistically significant and positive ($p < 0.001$).

Table 4.13: Relative Contribution of Infrastructure Dimensions to Tourism Development

Infrastructure Dimension	Standardized Beta (β)	Relative Contribution (%)	Rank
Tourism Infrastructure	0.342	35.7	1
Transport Infrastructure	0.229	23.9	2
Digital Connectivity	0.213	22.2	3
Accommodation Infrastructure	0.181	18.9	4
Total	0.965	100.0	—

Source: Primary Data

Table 4.13 shows the comparison of the four dimensions of infrastructure with regard to their relative contribution to Tourism Development, based on standardized beta coefficients. Tourism Infrastructure has the top standardized beta ($\beta = 0.342$), Transport Infrastructure ($\beta = 0.229$), Digital Connectivity ($\beta = 0.213$) and Accommodation Infrastructure ($\beta = 0.181$). That is, the greatest contribution in the regression model is from Tourism Infrastructure while the least contribution is from Accommodation Infrastructure. The pattern validates the notion that the destination facilities, accessibility and supporting infrastructure are important for tourism competitiveness and development (Dwyer & Kim, 2003; Prideaux, 2000; Chan et al., 2022). The results also reveal the complementary aspect of the digital connectivity aspect of modern tourism development (Liu & Jiang, 2024).

E. Integrated Findings

Table 4.14: Summary of Hypothesis Testing

Hypothesis	Statistical Test	Test Statistic	p-value	Decision
H1: Significant relationship exists between infrastructure dimensions and tourism development.	Pearson Correlation	$r = 0.571-0.671$	<0.001	Supported
H2: Infrastructure dimensions significantly influence tourism development.	Multiple Regression	$F = 121.85$	<0.001	Supported
H3: Combined infrastructure dimensions significantly explain variations in tourism development.	Regression Model	$R^2 = 0.610$	<0.001	Supported

Source: Primary Data

The results of the three hypotheses are summarised in table 4.14. All four dimensions of infrastructure have shown significant positive relationship with Tourism Development ($p < 0.001$) thus supporting the H1. This is also the case for H2 as the regression coefficient is highly positive for Transport Infrastructure, Accommodation Infrastructure, Digital Connectivity and Tourism Infrastructure (all $p < 0.001$). The overall regression model is statistically significant ($F = 121.85$, $p < 0.001$), explaining 61.0% of the variance in Tourism Development ($R^2 = 0.610$) is supportive of H3. In general, it demonstrates that there is a strong relationship and impact of infrastructure related factors on tourism development. This is consistent with the current literature of the tourism competitiveness studies in which transportation, destination facilities and supporting facilities are vital to tourism development (Dwyer & Kim, 2003; Chan et al., 2022; González-Rodríguez et al., 2023).

H1: Supported H2: Supported H3: Supported.

Table 4.15: Overall Empirical Model of Infrastructure and Tourism Development

Infrastructure Dimension	Relationship with Tourism Development	β	Significance
Transport Infrastructure	Positive	0.229	<0.001
Accommodation Infrastructure	Positive	0.181	<0.001
Digital Connectivity	Positive	0.213	<0.001
Tourism Infrastructure	Positive	0.342	<0.001
Overall Model	Significant	$R^2 = 0.610$	<0.001

Source: Primary Data

The general empirical model of the four dimensions of infrastructure with Tourism Development is given in Table 4.15. The four dimensions are all positively related, and have a statistically significant effect. The highest standardized coefficient (β) is for Tourism Infrastructure ($\beta = 0.342$), followed by Transport Infrastructure ($\beta = 0.229$), Digital

Connectivity ($\beta = 0.213$) and Accommodation Infrastructure ($\beta = 0.181$). The model accounted for 61.0% of the variance in Tourism Development ($R^2 = 0.610$, $p < 0.001$) which indicated that the model has a good explanatory power. The results are consistent with the destination competitiveness literature which supports accessibility and tourism facilities and supporting infrastructure as destination development factors (Dwyer & Kim, 2003; Crouch & Ritchie, 1999). The use of digital connectivity is also an indicator that digital infrastructure is increasingly important for the development of tourism today (Liu & Jiang, 2024).

CHAPTER 5: FINDINGS AND SUGGESTIONS

5.1 Major Findings of the Study

1. The study population was 500 from different age group, educational level, occupation, income level and frequency of tourism visited in selected districts of Karnataka. This diversity offers a wide foundation to gain an understanding of perceptions of tourism infrastructure and development. The multi dimensional nature of tourism development aligns with the notion of destination competitiveness that considers infrastructure and other supporting resources and accessibility as interdependent (Dwyer & Kim, 2003; Ritchie & Crouch, 2003).
2. Descriptive results indicate that all five constructs in the study are moderately positive. Favourable Perception of Tourism Infrastructure and Development: The highest mean score was for Tourism Development, with a score of 3.622, followed by Tourism Infrastructure, with a score of 3.615 and Digital Connectivity, with a score of 3.611. This indicates that on the whole, the respondents are satisfied with the infrastructure situation, but the moderate scores also indicate that there is room for improvement (Karnataka Tourism, 2024; Ministry of Tourism, 2024).
3. Good Reliability and Measurement Adequacy – All five constructs (Cronbach's alpha from 0.822 to 0.847) and the scale (0.916) had good internal consistency. The results of the KMO value (0.943) and significant Bartlett's Test ($p < 0.001$) also indicated that data was appropriate to factor analysis. Total variance explained by the five-factor solution is 61.02%, which could justify the conceptual separation of transport, accommodation, digital connectivity, tourism infrastructure and tourism development (Dwyer & Kim, 2003; González-Rodríguez et al., 2023).
4. Significant Positive Association between Infrastructure and Tourism Development. Pearson correlation analysis showed significant positive relationship between all four dimensions of Infrastructure and Tourism Development. The highest correlation was with Tourism Infrastructure ($r = 0.671$), followed by Transport Infrastructure ($r = 0.604$), Digital Connectivity ($r = 0.596$) and Accommodation Infrastructure ($r = 0.571$). So H1 was accepted. The results are consistent with tourism competitiveness studies that list infrastructure and facilities to support the tourism destination as one of the important aspects of the tourism development (Dwyer & Kim, 2003; Chan et al., 2022).
5. Demographic Variation in Tourism Development Perceptions. There was no statistically significant difference ($p = 0.390$) on the perceived Tourism Development from the gender perspective. The differences between occupation ($p = 0.021$), monthly income level ($p = 0.025$) and frequency of tourism-visit ($p = 0.006$) were significant, though. There were no statistically significant differences between age and education. This shows that there is a possibility that

the respondents' perception of the destination development can be related to the tourism experience and socioeconomic characteristics (OECD, 2024).

6. Infrastructure has a significant explanatory power: The multiple regression model was statistically significant ($F = 121.85$, $p < 0.001$) and the $R^2 = 0.610$ indicated that the four dimensions of infrastructure explained 61.0% of the variance of Tourism Development. The results confirm the H3 and indicate that the perception of tourism-development is largely dependent of infrastructures. This is in line with destination competitiveness perspectives in which infrastructure is included in the important bases of a destination's performance (Crouch & Ritchie, 1999; Dwyer & Kim, 2003).

7. All Four Infrastructure Dimensions Matter when it comes to tourism development: The regression analysis results indicate that all the four dimensions of infrastructure, namely Transport Infrastructure ($\beta = 0.229$), Accommodation Infrastructure ($\beta = 0.181$), Digital Connectivity ($\beta = 0.213$) and Tourism Infrastructure ($\beta = 0.342$) are positive and significant at $p < 0.001$. Therefore, H2 was right. The findings have highlighted the importance of transport connectivity, accommodation, digital connectivity and infrastructure of the destination in enhancing tourism development (Prideaux, 2000; Chan et al., 2022; Liu & Jiang, 2024).

8. Tourism Infrastructure was the highest standardized beta ($\beta = 0.342$) followed by Transport Infrastructure ($\beta = 0.229$), Digital Connectivity ($\beta = 0.213$) and Accommodation Infrastructure ($\beta = 0.181$). The results indicate that facilities and supporting infrastructure for tourism at the destination is the largest relative contribution in the estimated model. This is in line with the studies on tourism competitiveness that emphasize the role of resources and support systems of the destination as some of the factors affecting the tourism performance (Dwyer & Kim, 2003; González-Rodríguez et al., 2023).

5.2 Suggestions of the Study

1. Improvement in Tourism Infrastructure at Major and Emerging tourism destinations has the highest standardized influence ($\beta = 0.342$) and hence the improvement of tourism infrastructure including visitor amenities, tourist information centres, signage, sanitation facilities, parking facilities, public conveniences, interpretation and destination supporting services should be the priority in Karnataka. Investment in infrastructure is required not only in the early bird destinations, but also in emerging destinations so as to share the tourism benefits. This is in accordance with the idea of destination competitiveness and concentrates on the infrastructure and resources of the destination (Dwyer & Kim, 2003; Ritchie & Crouch, 2003; Karnataka Tourism, 2024).

2. Transport Connectivity to Tourism Destinations: Transport Infrastructure was found to have a very strong positive effect ($\beta = 0.229$). Therefore, efforts should be made to improve road connectivity, public transport connectivity, last-mile connectivity and inter-destination mobility, particularly for people outside the central urban areas. In line with the role of transportation in the destination development process, better transport accessibility can lower the travel barriers and enhance the accessibility and experience of visitors at the destination (Prideaux, 2000; Dwyer & Kim, 2003).

3. Digital Connectivity has significantly contributed to Tourism Development ($\beta = 0.213$). Karnataka should also further develop reliable mobile and internet connections at tourist sites, and develop and use digital platforms such as the online tourist information, digital maps,

multilingual tourist information, QR based interpretation, digital ticketing and real time travel information. Digital infrastructure is becoming a more relevant piece of the puzzle in today's tourism development, according to new studies (Chan et al., 2022; Liu & Jiang, 2024).

4. Upgrade Accommodation Facilities and Service Quality: Accommodation Infrastructure had comparatively lower standardized coefficient ($\beta = 0.181$) and it is statistically significant. Investment should therefore be targeted on making the accessibility, quality and quantity of accommodation available at various price points, especially closer to the emerging destinations. In addition to the official accommodation the Piraeus municipal authority can collaborate with private accommodation providers to increase the capacity without reducing the standard of service to visitors (Dwyer & Kim, 2003; OECD, 2024).

5. Implement Destination-Specific Infrastructure Planning: The vast difference in the perceptions of Tourism Development based on the occupation, income and frequency of visits to the destination indicate that infrastructure planning for tourism should be differentiated according to the visitor profile and the use of tourism. It is possible to replace the uniform infrastructure models in all the destinations with destination specific planning, inclusive of the demand for tourism and its intensity at the destination, economic status and conditions of the destination in Karnataka. This kind of destination planning is in line with sustainable tourism-development strategies (Ritchie & Crouch, 2003; OECD, 2024).

6. Support Integrated Public-Private Infrastructure Development: The four dimensions of infrastructure explained 61.0% of the variance in Tourism Development, implying that infrastructure needs to be developed in an integrated manner as opposed to a sector-by-sector approach. Joint projects between Government and local Government authorities, including tourism and private sector actors should be developed, including projects on transport, accommodation, digital connectivity and tourist facilities. This can help create destination competitiveness and enhance the overall tourism ecosystem (Crouch & Ritchie, 1999; Dwyer & Kim, 2003; Karnataka Tourism, 2024).

CHAPTER 6: CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

6.1 Conclusion

The study examined how Transport Infrastructure, Accommodation infrastructure, Digital Connectivity and Tourism infrastructure affects the Tourism development in Karnataka. Based on the empirical results obtained from the respondents (500) it has been found that all four dimensions are positively associated with the tourism development. Levels of reliability were acceptable for measurement scales and factor analysis revealed that there was multidimensionality within the study. The results of the correlation test showed that there were significant positive relationships with the infrastructure dimensions and the tourism development and it was proved that H1 was accepted. The regression model was statistically significant, and explained 61.0% of the variance of the tourism development, with all four dimensions of infrastructure having a significant positive influence, thus supporting H2 and H3. Transport Infrastructure (0.229), Digital Connectivity (0.213) and Accommodation Infrastructure (0.181) had standardized coefficients (β) just behind Tourism Infrastructure (0.342). This confirms the destination-competitiveness views of Crouch and Ritchie (1999), Dwyer and Kim (2003) and Ritchie and Crouch (2003) that infrastructure and supporting resources are a fundamental component of destination performance.

The results also indicate that tourism infrastructure should be regarded as a system and not as individual units of physical infrastructure. Good transport gives easier access to the area; good accommodation gives easier stay in the area; good digital connectivity gives easier delivery of information and services and good tourism facilities makes stay even more enjoyable. This is integrated vision as it is also highlighted by Prideaux (2000), Buhalis and Law (2008), Chan et al. (2022) and Liu and Jiang (2024), who also put into focus the importance of transport and technological infrastructure in the modern tourism. The results also align with recent studies which highlight the multidimensionality of destination competitiveness and the relevance of the contextual setting (Pérez León et al., 2022; González-Rodríguez et al., 2023; Zhao et al., 2024). The results reinforce the importance of maintaining a focus on destination infrastructure, connectivity and visitor facilities in the context of Karnataka's tourism, which is also reflected in Karnataka's tourism-policy priorities (Karnataka Tourism, 2021, 2024) and in the overall tourism-development agenda of India (Ministry of Tourism, 2024, 2025; UN Tourism, 2024). The overall findings of the study provide an empirical evidence to substantiate that coordinated strengthening of these infrastructure can be significant contribution in the development of tourism and competitiveness of the tourism destinations in Karnataka.

6.2 Future Scope for Research

The present study can be extended to include an increased number of samples with more geographical representation from all tourism regions of Karnataka including coastal, heritage, hill, wildlife and pilgrimage and emerging destinations in future. Comparative studies can be conducted to know the differences between Bengaluru, Mysuru, coastal Karnataka and Malnad and northern Karnataka, and understand the region specific infrastructure needs. Other issues such as environmental sustainability, image of the destination, quality of service, tourist satisfaction, involvement of the local community, safety, cost and institutional governance may also be considered in further research. Digital connectivity is becoming more and more important for the tourism industry; more in-depth research could be undertaken to discuss smart tourism, digital public infrastructure, artificial intelligence, mobile applications, online platforms and digital tourist experiences (Baggio & Del Chiappa, 2014; Buhalis & Law, 2008; Liu & Jiang, 2024; Zhou & Wang, 2024). Longitudinal studies can be used to find out what effect infrastructure will have on tourism development over time, rather than on cross sectional perceptions. To explore more complex infrastructure – destination competitiveness – tourism relationship, researchers can also use Structural Equation Modelling (SEM), PLS-SEM, spatial analysis, panel data or machine learning. Comparative studies with other states in India may also show differences in terms of how much each state invests in infrastructure development, and how competitive tourism is in each state (Fernández et al., 2020; Salinas Fernández et al., 2022; Zhao et al., 2024). Future research studies could also include sustainability and inclusive-development indicators, with particular emphasis on the connections of tourism infrastructure with employment, community well-being and the environment. This kind of research would align with the extensive policy efforts emphasised by OECD (2022, 2024), UN Tourism (2024) and World Economic Forum (2024) and would be useful in contributing to the overall evidence of sustainable and competitive tourism development in Karnataka.

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