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Village Economic Capacity as the Foundation for Sustainable Tourism Development: A Village Index-Based Measurement Model Using Confirmatory Factor Analysis

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Abstract

Rural tourism development requires a strong internal capacity of villages to provide tourism products, services, supporting facilities, and institutional resources. This study aims to develop and validate a Rural Tourism Supply Capacity (RTSC) measurement model based on village economic indicators using Confirmatory Factor Analysis (CFA) with AMOS. The study employed a quantitative approach using secondary data from the Village Index of 285 villages in Kerinci Regency, Indonesia. Six observed indicators were examined as dimensions of RTSC: village superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions. All indicators significantly represented the RTSC construct ($p < 0.05$). Among the indicators, village superior products showed the strongest contribution ($\lambda = 0.898$; SMC = 0.806), followed by economic activities and creative economy. The findings confirm that village economic capacity, particularly local products and community-based economic activities, forms the foundation of rural tourism supply development. This study contributes a validated measurement framework for assessing village readiness and supporting evidence-based strategies for sustainable rural tourism development.

Keywords: Rural Tourism Supply Capacity, Village Index, Sustainable Tourism, Village Economic Capacity, Confirmatory Factor Analysis.

INTRODUCTION

Tourism has increasingly become an important instrument for promoting inclusive economic growth, particularly in rural areas where natural resources, cultural heritage, and community-based tourism provide opportunities for local development. Rural tourism

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development is not only associated with increasing visitor numbers but also involves strengthening the capacity of local destinations to provide tourism products, services, infrastructure, and institutional support (Mulyani *et al.*, 2022). In this context, the competitiveness of rural destinations is strongly influenced by the quality of tourism supply, which includes attractions, accessibility, amenities, human resources, community participation, and destination governance (Sumantri, 2020; Cirer-Costa, 2021; Gilaninia and Sharifi, 2022). However, many rural areas still face challenges in transforming their existing resources into competitive tourism destinations due to limited infrastructure, weak institutional capacity, inadequate tourism management, and uneven development conditions.

The concept of rural destination competitiveness emphasizes that tourism development cannot be separated from the broader development capacity of rural areas. A village with adequate economic, social, environmental, and institutional conditions has greater potential to develop a sustainable tourism supply (Hastuti and Assriyani, 2021; Kuklina *et al.*, 2021). Therefore, the village index can serve as an important foundation for assessing the readiness and capacity of villages in supporting tourism activities. Village development is a multidimensional concept that reflects various aspects, including infrastructure availability, economic resilience, social capital, public services, environmental sustainability, and institutional effectiveness (Juma and Khademi-Vidra, 2019; Sarmento and Monteiro, 2023). These dimensions are closely related to the ability of rural destinations to create attractive, accessible, and sustainable tourism experiences (Jędruch, Furmankiewicz and Kaczmarek, 2020; Davardoust and Karahan, 2021; Cao *et al.*, 2022).

In many developing countries, including Indonesia, village development policies have shifted from a conventional administrative approach toward a more comprehensive development framework that recognizes villages as strategic actors in economic transformation (Meldona *et al.*, 2023). The implementation of village development programs has encouraged local governments and communities to utilize endogenous resources, including tourism potential, as a mechanism for poverty reduction, employment creation, and strengthening local economies (Nurvianti and Hastuti, 2021). Nevertheless, the existence of village development indices has generally been used to measure development performance from a socioeconomic perspective, while their relevance as a measurement framework for tourism supply capacity remains insufficiently explored.

Tourism supply represents the capacity of a destination to provide tourism-related resources and services required to meet visitor expectations. According to tourism development perspectives, supply-side factors play a critical role because destinations compete not only based on their attractiveness but also on their ability to organize resources

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into valuable tourism experiences (Tao and Huaju, 2020; Nantavisit *et al.*, 2024). Rural destinations require integrated capacities involving physical infrastructure, accessibility networks, local economic activities, cultural resources, environmental quality, and institutional collaboration (Nematpour *et al.*, 2024). Therefore, identifying and validating the dimensions of village development that contribute to tourism supply is essential for designing evidence-based rural tourism development strategies.

Previous studies have extensively examined rural tourism development from the perspectives of destination management, community participation, sustainable tourism, and local economic development. Several studies have highlighted the importance of accessibility, amenities, local resources, and governance in determining tourism competitiveness (Ribes, Rodríguez and Jiménez, 2011; Hiyab *et al.*, 2023; Vašaničová *et al.*, 2023). However, most existing studies tend to analyze individual factors separately or employ descriptive approaches to evaluate tourism potential (Gavurova, Rigelsky and Mikeska, 2023). Limited attention has been given to developing an integrated measurement model that explains how multidimensional village development indicators collectively represent the capacity of rural areas to strengthen tourism supply and destination competitiveness.

Furthermore, although composite indices have been widely applied in measuring regional and village development, the validity of their underlying constructs is often overlooked. A development index generally consists of several observed indicators assumed to represent latent dimensions; therefore, statistical validation is required to ensure that these indicators accurately reflect the intended construct. Confirmatory Factor Analysis (CFA) provides an appropriate analytical approach for validating theoretical measurement models by examining the relationship between observed indicators and latent variables (Sari, Haryono and Yuliviona, 2024). Through CFA, researchers can determine whether village index indicators adequately represent the dimensions associated with tourism supply capacity and rural destination competitiveness.

The application of CFA in tourism and regional development research offers several advantages. First, it enables the identification of the most influential indicators contributing to a latent construct. Second, it provides empirical evidence regarding the reliability and validity of measurement models. Third, CFA supports the development of theoretically grounded frameworks that can be applied for policy formulation and destination planning. Consequently, integrating village development indicators with CFA can provide a more comprehensive understanding of how rural development capacity contributes to tourism competitiveness.

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The main research gap lies in the limited understanding of rural tourism from the supply-side perspective. While previous studies have extensively examined tourist demand, destination attractiveness, and tourism impacts, fewer studies have empirically investigated how village economic capacities construct rural tourism supply readiness. Moreover, the utilization of Village Index indicators as a foundation for measuring tourism supply capacity remains underexplored. This study fills this gap by developing and validating a Rural Tourism Supply Capacity model using six village-level economic indicators: superior village products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions. Through CFA-AMOS analysis, this research provides a validated measurement framework for assessing the internal capacity of villages to support sustainable rural tourism development.

This study introduces a novel perspective by developing a measurement model of rural tourism supply capacity using village economic indicators derived from the Village Index. Previous studies on rural tourism have largely emphasized tourism demand, visitor behavior, destination attractiveness, or tourism impacts, while limited attention has been given to the internal capacity of villages as tourism suppliers. This research addresses this gap by conceptualizing rural tourism supply capacity through six measurable dimensions: village Village superior products (X1), creative economy (X2), economic activities (X3), restaurants (X4), accommodation facilities (X5), and economic institutions (X6). These indicators represent the essential components of tourism supply, including local attractions, tourism-supporting services, community-based economic activities, and institutional capacity. The novelty of this study lies in empirically validating these dimensions through Confirmatory Factor Analysis (CFA) using AMOS to establish a robust measurement model of rural tourism supply capacity. The resulting model provides an evidence-based framework for evaluating village readiness and strengthening sustainable rural tourism development strategies.

This study aims to develop and validate a measurement model of Rural Tourism Supply Capacity (RTSC) based on village economic indicators using Confirmatory Factor Analysis (CFA) with AMOS. Specifically, this research aims to identify and evaluate the extent to which six village-level economic dimensions represent the underlying construct of rural tourism supply capacity. By validating these indicators, this study seeks to provide an empirical framework for assessing the readiness and internal capacity of villages in supporting sustainable rural tourism development.

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THEORETICAL REVIEW

The village index represents a multidimensional framework that reflects the capacity of villages in achieving sustainable development through economic, social, environmental, and institutional dimensions (Haryono *et al.*, 2026). From a development perspective, villages with stronger infrastructure, better public services, higher community empowerment, and effective governance mechanisms tend to possess greater capacity to develop competitive tourism activities. These development components create enabling conditions for tourism supply by supporting accessibility, tourism facilities, local entrepreneurship, and destination management (Sari and Hamdani, 2024).

The relationship between village index and tourism development can be explained through the endogenous development theory, which emphasizes that sustainable regional development is generated through the optimization of internal resources, local knowledge, institutional capacity, and community participation (Hastuti and Assriyani, 2021). In the context of rural tourism, villages are not merely locations where tourism activities occur but active actors that produce tourism experiences through their unique social, cultural, and environmental assets. Therefore, village development capacity becomes an important foundation for strengthening tourism supply.

Tourism supply refers to the capacity of destinations to provide resources, facilities, services, and experiences required by tourists. According to destination system theory, tourism supply consists of interconnected components, including attractions, accessibility, amenities, supporting services, human resources, and institutional arrangements (Permatasari, Widiati and Suryani, 2019). The quality and integration of these components determine the ability of a destination to compete and sustain tourism growth.

In rural destinations, tourism supply is highly dependent on local development conditions (Tao and Huaju, 2020). Unlike urban tourism destinations that often have established infrastructure and professional tourism services, rural destinations frequently rely on community-based resources and locally available assets. Consequently, improvements in village development dimensions become critical factors in strengthening tourism supply capacity.

Destination competitiveness has become a central concept in tourism studies because it explains why certain destinations are more successful than others in attracting visitors and sustaining tourism development. According to the destination competitiveness framework proposed by Ritchie and Crouch, competitiveness is determined by the interaction between core resources, supporting factors, destination management, and external environmental conditions (Crouch and Ritchie, 1999).

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The proposed framework assumes that village development indicators represent the foundational capacity that enables rural communities to develop tourism supply. Furthermore, improved tourism supply capacity contributes to stronger destination competitiveness. Therefore, village development functions as an upstream factor that shapes tourism performance through the strengthening of tourism supply components (Sari *et al.*, 2022).

The study hypothesizes that Rural Tourism Supply Capacity is a multidimensional construct reflected by village economic indicators. Specifically, village Village superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions are expected to significantly contribute to the formation of rural tourism supply capacity.

METHOD

Research Design

This study employs a quantitative research design using a Confirmatory Factor Analysis (CFA) approach with Structural Equation Modeling (SEM) through AMOS software. The research is designed to develop and validate a measurement model of Rural Tourism Supply Capacity (RTSC) based on village economic indicators. CFA is applied to examine whether the proposed indicators adequately represent the underlying latent construct of rural tourism supply capacity.

The study utilizes secondary quantitative data obtained from the Village Index database, where villages are used as the unit of analysis. The research focuses on economic dimensions that represent the supply-side capacity of rural tourism, including village Village superior products (X1), creative economy (X2), economic activities (X3), restaurants (X4), accommodation facilities (X5), and economic institutions (X6). These indicators are theoretically derived from the tourism supply framework, which emphasizes attraction, amenities, supporting services, and institutional capacity as essential components of tourism development.

Setting and Study Population

The study population comprised all villages in Kerinci Regency, totaling 285 villages. Each village was considered a unit of analysis because the research focuses on validating accessibility indicators within the village index and examining their relevance to the development of village tourism supply. By covering the entire village population, the study aimed to provide a comprehensive empirical basis for assessing how accessibility dimensions are represented in the village index and how they may contribute to strengthening village tourism development.

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Sampling Technique Procedure

This study employed a census sampling technique, also known as total sampling, in which all members of the population were included as research samples. The population consisted of all 285 villages in Kerinci Regency, and therefore, each village was selected as a unit of analysis. This approach was chosen because the study aimed to obtain a comprehensive representation of village accessibility characteristics within the Village Index and avoid sampling bias that may occur when selecting only a subset of villages. The census approach is considered appropriate when the population size is manageable and when the research objective is to develop and validate a measurement model that represents the overall characteristics of the studied population.

Data Collection

This study uses secondary quantitative data collection obtained from the Village Index database. The data used in this study were obtained from the Village Index dataset of Kerinci Regency in 2025. The dataset consists of village-level development indicators that describe the economic capacity and supporting resources of rural areas. The village is selected as the unit of analysis because tourism supply capacity is fundamentally determined by the availability of local resources, economic activities, supporting facilities, and institutional structures within the destination area. The data collection process involves identifying and extracting relevant indicators from the Village Index that theoretically correspond to the concept of Rural Tourism Supply Capacity (RTSC).

Data Analysis

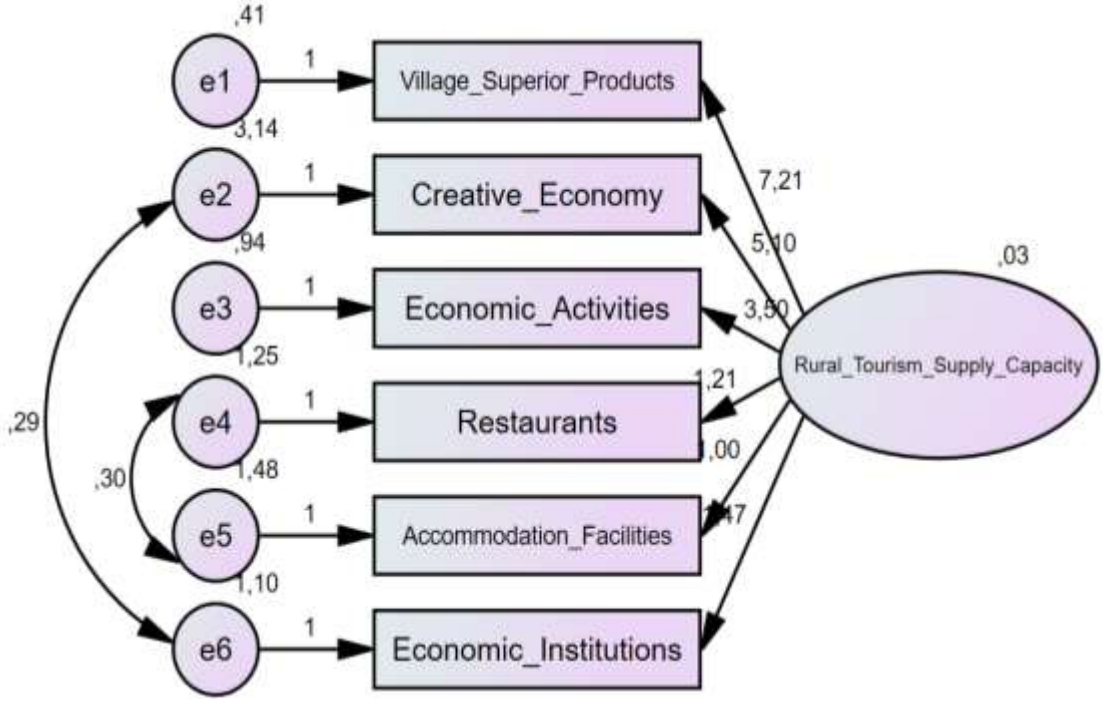
The data analysis was conducted using Confirmatory Factor Analysis (CFA) with the assistance of AMOS software to validate the measurement model of accessibility dimensions within the Village Index framework. CFA was applied to examine whether the proposed accessibility indicators adequately represent the underlying latent construct related to village tourism supply development. The analysis process involved evaluating factor loadings, construct reliability, convergent validity, and model fit indices. The goodness-of-fit assessment was performed using several criteria, including Chi-square (χ^2), Chi-square/degrees of freedom (CMIN/DF), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Indicators with adequate factor loading values were retained to form a valid measurement model. The validated model provides empirical evidence regarding the role of accessibility dimensions in the Village Index as a foundation for strengthening village tourism supply.

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RESULTS

Figure 1 presents the CFA measurement model of Rural Tourism Supply Capacity, illustrating the relationships between the latent construct and its six observed indicators: village superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions.



Picture 1. Confirmatory Factor Analysis (CFA) Accessibility

Analysis of Goodness of Fit

Table 1 presents the goodness-of-fit results used to assess the agreement between the proposed model and the empirical data. All evaluated indices meet the recommended cut-off values, indicating that the model demonstrates satisfactory fit and is suitable for further analysis.

Table 1: Goodness of Fit

Criteria of GOF	Cut of Value	Result	Criteria
X^2 (Chi-Square)	≤ 2,56	1,908	Good
Probabilty	≥ 0,05	0,064	Good
GFI	≥ 0,90	0,985	Good
AGFI	≥ 0,90	0,954	Good

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RMSEA	≤ 0,08	0,057	Good
NFI	≥ 0,90	0,933	Good
TLI	≥ 0,90	0,926	Good

The goodness of fit evaluation demonstrates that the CFA model of Rural Tourism Supply Capacity (RTSC) has achieved a good model fit. The Chi-square value (χ^2 = 1.908) and probability value (0.064) meet the recommended criteria, indicating no significant difference between the proposed model and empirical data. Furthermore, all fit indices meet the required thresholds, including GFI = 0.985, AGFI = 0.954, RMSEA = 0.057, NFI = 0.933, and TLI = 0.926. These results confirm that the measurement model adequately represents the observed data and supports the validity of the proposed construct. Therefore, the six indicators are confirmed as appropriate dimensions for measuring rural tourism supply capacity.

Analysis of Regression Weights

The regression weight results from the CFA analysis indicate that all observed indicators significantly contribute to the latent construct Rural Tourism Supply Capacity (RTSC).

Table 2: Regression Weights

			Estimate	S.E.	C.R.	P
Accommodation_Facilities	<---	RTSC	1,000			
Restaurants	<---	RTSC	1,212	,589	2,056	,040
Economic_Activities	<---	RTSC	3,495	1,566	2,232	,026
Creative_Economy	<---	RTSC	5,098	2,316	2,202	,028
Village_Superior_Products	<---	RTSC	7,206	3,302	2,182	,029
Economic_Institutions	<---	RTSC	1,473	,746	1,976	,048

The significance of each indicator is demonstrated by the Critical Ratio (C.R.) value greater than 1.96 and p-value below 0.05, confirming that all indicators are valid measurements of the construct. The results show that Restaurants (C.R. = 2.056; p = 0.040), Economic Activities (C.R. = 2.232; p = 0.026), Creative Economy (C.R. = 2.202; p = 0.028), Village Superior Products (C.R. = 2.182; p = 0.029), and Economic Institutions (C.R. = 1.976; p = 0.048) have significant relationships with Rural Tourism Supply Capacity. Among these indicators, Village Superior Products has the highest unstandardized loading value (Estimate = 7.206), followed by Creative Economy (Estimate = 5.098) and Economic

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Activities (Estimate = 3.495), indicating that local products, innovation-based economic activities, and community economic dynamics are important components forming rural tourism supply capacity. Meanwhile, Accommodation Facilities is used as the reference indicator with the loading fixed at 1.000.

Overall, the CFA results confirm that the six indicators—village superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions—significantly represent the latent construct of Rural Tourism Supply Capacity. These findings support the proposed measurement model and indicate that village economic resources and supporting facilities are fundamental elements in assessing the readiness of rural areas to develop sustainable tourism supply.

Analysis of Standardized Regression Weights

Table 3 presents the standardized regression weights of the CFA measurement model, illustrating the contribution of each observed indicator in representing the latent construct of Rural Tourism Supply Capacity (RTSC). The standardized factor loading values are used to evaluate the relative strength of each indicator in explaining the underlying construct, where higher loading values indicate a stronger contribution to the formation.

Table 3: Standardized Regression Weights

			Estimate
Accommodation_Facilities	<---	Rural_Tourism_Supply_Capacity	,148
Restaurants	<---	Rural_Tourism_Supply_Capacity	,193
Economic_Activities	<---	Rural_Tourism_Supply_Capacity	,549
Creative_Economy	<---	Rural_Tourism_Supply_Capacity	,463
Village_Superior_Products	<---	Rural_Tourism_Supply_Capacity	,898
Economic_Institutions	<---	Rural_Tourism_Supply_Capacity	,248

The highest factor loading is observed for Village Superior Products (λ = 0.898), indicating that local superior products are the strongest dimension representing rural tourism supply capacity. This finding suggests that the uniqueness and economic value of village-based products play a central role in establishing tourism supply potential. The second strongest indicator is Economic Activities (λ = 0.549), followed by Creative Economy (λ = 0.463), indicating that local economic diversity and creative-based activities contribute to strengthening rural tourism capacity.

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Meanwhile, Economic Institutions (λ = 0.248), Restaurants (λ = 0.193), and Accommodation Facilities (λ = 0.148) show relatively lower factor loadings. Although these indicators remain statistically significant based on the regression weight results, their contribution to the latent construct is weaker. This indicates that supporting facilities and institutional aspects have not yet become dominant characteristics of rural tourism supply capacity compared with local products and economic activities.

Overall, the CFA results demonstrate that Village Superior Products, Economic Activities, and Creative Economy are the primary dimensions forming Rural Tourism Supply Capacity, while restaurants, accommodation facilities, and economic institutions represent complementary supporting components. The findings emphasize that rural tourism development in the studied villages is primarily driven by local economic resources and community-based value creation rather than solely by physical tourism infrastructure.

Analysis of Squared Multiple Correlations

Table 4 presents the Squared Multiple Correlations (SMC) values, indicating the proportion of variance in each observed indicator explained by the latent construct of Rural Tourism Supply Capacity and evaluating indicator reliability within the CFA model.

Table 4: Squared Multiple Correlations

	Estimate
Economic_Institutions	,061
Village_Superior_Products	,806
Creative_Economy	,215
Economic_Activities	,301
Restaurants	,037
Accommodation_Facilities	,022

The Squared Multiple Correlations (SMC) values represent the proportion of variance in each observed indicator that can be explained by the latent construct Rural Tourism Supply Capacity (RTSC). In CFA, the SMC value is equivalent to the squared factor loading (λ^2), indicating the explanatory power of the latent variable toward each indicator. Higher SMC values indicate that the indicator is better explained by the underlying construct.

The results show that Village Superior Products has the highest SMC value (0.806), meaning that 80.6% of its variance is explained by Rural Tourism Supply Capacity. This

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indicates that village superior products are the strongest representation of rural tourism supply capacity, reflecting the importance of local resources and distinctive village-based products as tourism supply components.

The second-highest explanatory value is found in Economic Activities (0.301), indicating that 30.1% of the variance in economic activities is explained by RTSC. Meanwhile, Creative Economy (0.215) contributes 21.5% of the explained variance, suggesting that innovation and creative economic activities also play a role in forming rural tourism supply capacity.

However, Economic Institutions (0.061), Restaurants (0.037), and Accommodation Facilities (0.022) show relatively low SMC values, indicating that only a small proportion of their variance is explained by the RTSC construct. These indicators may function as supporting elements rather than the primary dimensions forming rural tourism supply capacity.

Overall, the SMC results confirm that Village Superior Products, Economic Activities, and Creative Economy are the main indicators representing Rural Tourism Supply Capacity, while restaurants, accommodation facilities, and economic institutions provide complementary support. The findings highlight that rural tourism supply capacity is primarily driven by the ability of villages to generate unique local products and strengthen community-based economic activities.

DISCUSSION

This study developed and validated a measurement model of Rural Tourism Supply Capacity (RTSC) based on village economic indicators using Confirmatory Factor Analysis (CFA) with AMOS. The findings demonstrate that the proposed construct provides an acceptable representation of rural tourism supply capacity, as evidenced by the goodness-of-fit results and the significant contribution of the observed indicators. The model confirms that village-level economic resources can be conceptualized as fundamental components of tourism supply capacity, extending previous tourism studies that have predominantly emphasized demand-side perspectives, such as tourist motivation, satisfaction, and destination experience.

The CFA results indicate that all six indicators significantly represent the RTSC construct, including village superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions. These findings support the tourism supply framework, which highlights that tourism development depends not only on the existence of attractions but also on the capacity of local communities to provide products, services, facilities, and institutional support. Therefore, rural tourism should be

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understood as an integrated economic ecosystem where local resources are transformed into tourism value through community-based production and service activities.

Among the indicators, village superior products demonstrated the strongest contribution to Rural Tourism Supply Capacity, with the highest standardized loading (λ = 0.898) and the highest squared multiple correlation value (SMC = 0.806). This finding indicates that the uniqueness of local products represents the primary foundation of rural tourism supply. Village superior products, including agricultural commodities, handicrafts, culinary products, and local cultural products, can function as tourism attractions by providing authentic experiences that differentiate rural destinations from conventional tourism areas. This result aligns with the concept of community-based tourism, which emphasizes the importance of utilizing local resources and community creativity as the core assets of sustainable tourism development.

The findings also reveal that economic activities (λ = 0.549; SMC = 0.301) and creative economy (λ = 0.463; SMC = 0.215) contribute to the formation of RTSC. These results indicate that diversified economic activities and innovation-based production systems are important mechanisms for strengthening tourism supply. Rural tourism does not rely solely on natural or cultural attractions but requires active local economic participation to create tourism experiences, increase community involvement, and generate economic benefits. The creative economy plays a particularly important role because it enables villages to transform existing resources into higher-value tourism products, such as souvenirs, cultural performances, culinary innovation, and experiential tourism activities.

However, the contribution of restaurants, accommodation facilities, and economic institutions was relatively lower compared with other indicators. Although these indicators were statistically significant, their standardized loading values were weaker, suggesting that physical facilities and formal institutions are still developing components within rural tourism supply capacity. This condition may reflect the characteristics of many rural destinations where tourism growth initially emerges from local resources and community initiatives before being followed by improvements in accommodation, culinary services, and institutional arrangements. Thus, strengthening tourism infrastructure and institutional capacity remains necessary to enhance the sustainability and competitiveness of rural tourism destinations.

The study contributes theoretically by shifting the understanding of rural tourism development from a destination-demand perspective toward a supply-side capacity perspective. The proposed RTSC model provides an empirical framework for measuring how village economic characteristics contribute to tourism readiness. Methodologically, the application of CFA-AMOS provides statistical validation of the construct and demonstrates

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that Village Index indicators can be utilized beyond measuring general village development by serving as a foundation for tourism planning.

From a practical perspective, the findings suggest that rural tourism policies should prioritize strengthening local superior products, supporting creative economic activities, and improving community-based economic systems. Rather than focusing solely on physical tourism infrastructure, policymakers should develop village capabilities through product innovation, entrepreneurship programs, and institutional strengthening. By enhancing these internal capacities, villages can build a more resilient and sustainable tourism supply ecosystem. Overall, this research provides a validated measurement model that can assist governments and stakeholders in identifying village readiness and designing evidence-based strategies for sustainable rural tourism development.

CONCLUSION

This study successfully developed and validated a Rural Tourism Supply Capacity (RTSC) measurement model using village economic indicators through Confirmatory Factor Analysis (CFA) with AMOS. The results confirm that the proposed model has good goodness-of-fit and that the six indicators—village superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions—significantly represent the RTSC construct. Among these indicators, village superior products emerged as the strongest dimension, demonstrating that local resources and unique village-based products are fundamental elements in building rural tourism supply capacity. Economic activities and the creative economy also contribute substantially by strengthening local value creation and community participation. These findings highlight that rural tourism development should focus not only on physical infrastructure but also on enhancing local economic capabilities and institutional support. The validated RTSC model provides an empirical framework for assessing village readiness and supporting evidence-based strategies for sustainable rural tourism development.

Recommendations

Based on the findings, several recommendations can be proposed to strengthen rural tourism supply capacity. **First**, village governments and tourism stakeholders should prioritize the development of village superior products as the main foundation of rural tourism supply by improving product quality, innovation, branding, and market accessibility. **Second**, strengthening the creative economy and local economic activities is essential to creating diverse tourism experiences and increasing community participation in tourism value chains. **Third**, although restaurants, accommodation facilities, and economic

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institutions showed lower contributions, these components should be gradually improved through infrastructure development, business assistance, and institutional capacity building to ensure long-term tourism sustainability. Furthermore, policymakers can utilize the Rural Tourism Supply Capacity (RTSC) model as an assessment instrument to identify village readiness and determine priority interventions for tourism development. Future research is recommended to integrate demand-side indicators, such as tourist visits, satisfaction, and economic impacts, to develop a more comprehensive model of rural tourism performance.

Limitations and suggestions for further study

This study has several limitations that should be acknowledged. First, the research relies on secondary data from the Village Index, which limits the availability of specific tourism-related performance indicators, such as tourist arrivals, visitor satisfaction, tourism revenue, and destination competitiveness. Therefore, the proposed Rural Tourism Supply Capacity (RTSC) model focuses primarily on the supply-side capacity of villages rather than measuring actual tourism performance outcomes. Second, the indicators used in this study are limited to village economic dimensions, including superior products, creative economy, economic activities, restaurants, accommodation facilities, and economic institutions.

Future studies are recommended to expand the RTSC model by integrating additional dimensions related to sustainable tourism, infrastructure, environmental management, and digital transformation. Further research may also combine supply-side indicators with demand-side variables, such as tourist behavior, visitation trends, and economic impacts, to develop a more comprehensive tourism development model. Longitudinal studies are also encouraged to examine the dynamic evolution of rural tourism capacity and its contribution to sustainable rural development.

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