

# Research on the Coupling and Coordination between Rural Tourism and Rural Revitalization: A Case Study of Chongqing

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**Abstract:** The high-quality development of rural tourism is an important approach to realizing the strategy of rural revitalization. By employing the “Entropy Method and System Coupling Coordination Degree Model”, this article analyzes the comprehensive development level and coupling coordination degree between the rural tourism system and the rural revitalization system in Chongqing, based on time-series data from 2014 to 2023. The research indicates that the coupling coordination degree between rural tourism and rural revitalization in Chongqing generally shows a fluctuating upward trend, steadily progressing from primary coordination to good coordination, with a significant synergistic development effect.

**Keywords:** Rural tourism; Coupling coordination; Rural revitalization; Chongqing

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## 1. Introduction

The Third Plenary Session of the 20th Central Committee emphasized the importance of driving rural tourism development with comprehensive deepening reform as the impetus and industrial prosperity and increased farmer incomes as the core, which helps systematically advance the comprehensive modernization of rural areas in political, economic, social, cultural, and ecological aspects<sup>[1]</sup>. Domestic scholars have primarily focused their research on rural tourism and rural revitalization in areas such as the development paths of the rural tourism industry under the rural revitalization strategy, the coordination relationship between the rural tourism industry and the rural economy, the contribution of the rural tourism industry to the implementation of the rural revitalization strategy, and the dynamic mechanisms by which rural tourism promotes rural revitalization<sup>[2-4]</sup>. Some studies have selected typical counties in ethnic regions as case studies, constructed evaluation index systems for improving the quality and efficiency of rural tourism and rural revitalization, and utilized their coupling coordination relationships for analysis, employing the Entropy Method and Coupling Coordination Degree Model, respectively<sup>[5]</sup>. The research has found that, overall,

there is a trend of coupling coordination, with a significant synergistic development effect.

In summary, with the continuous development of rural tourism and the in-depth implementation of the rural revitalization strategy, the application of coupling coordination theory in rural tourism will become more widespread and profound <sup>[6]</sup>. Therefore, this paper utilizes the coupling coordination model to clarify the level of coupled and coordinated development between rural tourism and rural revitalization in Chongqing and offers suggestions accordingly.

## 2. Research methodology

### 2.1. Coupling coordination degree model

Coupling degree, as a dynamic correlation indicator measuring the mutual influence, mutual promotion, and tendency towards coordinated development among two or more systems, reveals the intrinsic mechanism of synergistic evolution between systems <sup>[7]</sup>. Coupling coordination degree further quantifies the degree of positive interaction within this dynamic relationship, becoming a key indicator for assessing the quality of the coordination state <sup>[8]</sup>. Based on the coupling degree theoretical model, this paper delves into the coordinated development elements between the two major systems of rural tourism and rural revitalization in Chongqing, aiming to precisely depict the specific patterns and characteristics of their coupling coordination through quantitative analysis methods. The model construction is as follows:

$$C = \sqrt{2 \frac{2*[A(x)^2 + T(y)^2]}{[A(x) + T(y)]^2}} \quad (1)$$

In the formula, C represents the coupling degree between the two systems, with its value range defined within the interval [0, 1]. When the value of C approaches 1, it indicates a high degree of coupling between the two systems, with the coupling relationship presenting a benign trend; conversely, when the value of C approaches 0, the coupling degree significantly decreases, and the dynamic correlation between the two systems weakens. A(x) and T(y), as variables, influence the synergistic development of rural tourism and rural revitalization.

Coupling coordination degree model:

$$D = \sqrt{C * B} \quad (2)$$

$$\text{Where, } B = aA(x) + bT(y) \quad (3)$$

#### 2.1.1. D in the formula

It represents the coupling coordination degree between rural tourism and rural revitalization in Chongqing, with its value range limited to the interval [0, 1]. When the value approaches 1, it indicates an excellent coupling state between the two systems; conversely, it implies a weakened dynamic correlation between them <sup>[9]</sup>.

#### 2.1.2. B in the formula

Represents the comprehensive coordination index of the two subsystems, where a and b are undetermined coefficients used to measure the contribution proportion of the two in the process of coordinated development <sup>[10]</sup>. Given that both hold equal status, it is set that a = b = 0.5. Based on the regression analysis of rural data in Chongqing over the past three years, the validity and applicability of the above model can be further explored and verified. In recent years,

Chongqing has actively responded to the national call, vigorously developed rural tourism, and regarded it as a crucial component of promoting the rural revitalization strategy <sup>[11]</sup>.

## 2.2. Indicator system table

The evaluation indicator system for rural tourism and rural revitalization is shown in **Table 1**.

**Table 1.** Evaluation indicator system for rural tourism and rural revitalization

System	Primary Indicator	Secondary Indicator	Attribute	Weight
Rural Tourism	Demand Level	Total Tourism Revenue (¥100 million)	+	0.139
		Total Tourist Trips (10,000 person-times)	+	0.093
		Per Capita Tourism Spending (¥10,000)	+	0.072
		Number of A-rated Scenic Spots	+	0.054
	Resource & Environment	Harmless Treatment Rate of Household Waste (%)	+	0.027
		Forest Coverage Rate (%)	+	0.050
	Support Conditions	Road Density (10,000 km / km <sup>2</sup> )	+	0.042
		Number of Star-rated Hotels	+	0.071
		Number of Internet Broadband Subscribers (10,000 households)	+	0.093
	Industrial Effect	Tourism Output Value Density (¥10,000 / km <sup>2</sup> )	+	0.179
		Total Annual Retail Sales of Accommodation & Catering (¥100 million)	+	0.069
		Proportion of Tourism Revenue to GDP (%)	+	0.111
Rural Revitalization	Thriving Businesses	Added Value of the Primary Industry (¥100 million)	+	0.066
		Gross Regional Product (¥100 million)	+	0.058
		Output Value of Agricultural Product Processing (¥100 million)	+	0.074
		Total Agricultural Machinery Power (10,000 kW)	+	0.067
	Pleasant Living Environment	Sanitary Toilet Penetration Rate (%)	+	0.047
		Village Greening Coverage Rate (%)	+	0.048
		Tap Water Penetration Rate (%)	+	0.037
		Number of Village Reading Rooms	+	0.061
	Civic Virtues	TV Coverage Rate (%)	+	0.037
		Number of Township Cultural Stations	+	0.199
	Effective Governance	Urban-Rural Household Per Capita Consumption Ratio (%)	-	0.034
		Urban-Rural Per Capita Income Ratio (%)	-	0.018
		General Public Budget Expenditure (¥100 million)	+	0.061
		Farmers' Net Income Per Capita (¥)	+	0.078
		Rural Residents' Engel's Coefficient (%)	-	0.033
		Rural Residents' Consumption Expenditure Per Capita (¥)	+	0.082

### 3. Case analysis: Overview of rural tourism development in Chongqing

#### 3.1. Overview of administrative regions in Chongqing

Chongqing is the only municipality directly under the central government in central and western China, located in the upper reaches of the Yangtze River. Covering an area of approximately 82,400 square kilometers, it is the largest municipality in China by area. As of 2023, the city has a permanent population of approximately 32.1334 million and administers 38 county-level administrative regions, including 26 municipal districts, 8 counties, and 4 autonomous counties.

#### 3.2. Overview of gross domestic product in Chongqing

In 2024, Chongqing's gross regional product (GDP) reached 3,219.315 billion yuan, representing a year-on-year increase of 5.7% at constant prices. The per capita gross regional product exceeded 100,000 yuan for the first time. By sector, the added value of the primary industry was 213.582 billion yuan, up by 2.4%; the added value of the secondary industry was 1,169.068 billion yuan, up by 4.6%; and the added value of the tertiary industry was 1,836.665 billion yuan, up by 6.8%, accounting for 57.1% of GDP, with its leading position further strengthened.

#### 3.3. Current situation of rural tourism development

From the perspective of economic contribution, rural tourism generated an income of 34.9 billion yuan, accounting for approximately 1.1% of the city's GDP. It plays a significant role in driving income growth, employment, and the upgrading of the industrial structure in rural areas. Considering the total tourism revenue of the city, which amounts to approximately 250 billion yuan, rural tourism contributes about 14%. This indicates that rural tourism has become an important component of Chongqing's tourism industry, second only to traditional tourism forms such as urban sightseeing and cultural heritage. In 2024, rural tourism received 152 million visitors, maintaining rapid growth compared to previous years. The government has issued the "Opinions on Accelerating the Development of Rural Tourism" to promote the layout of "three zones and three belts", further enhancing the product quality and brand influence of rural tourism.

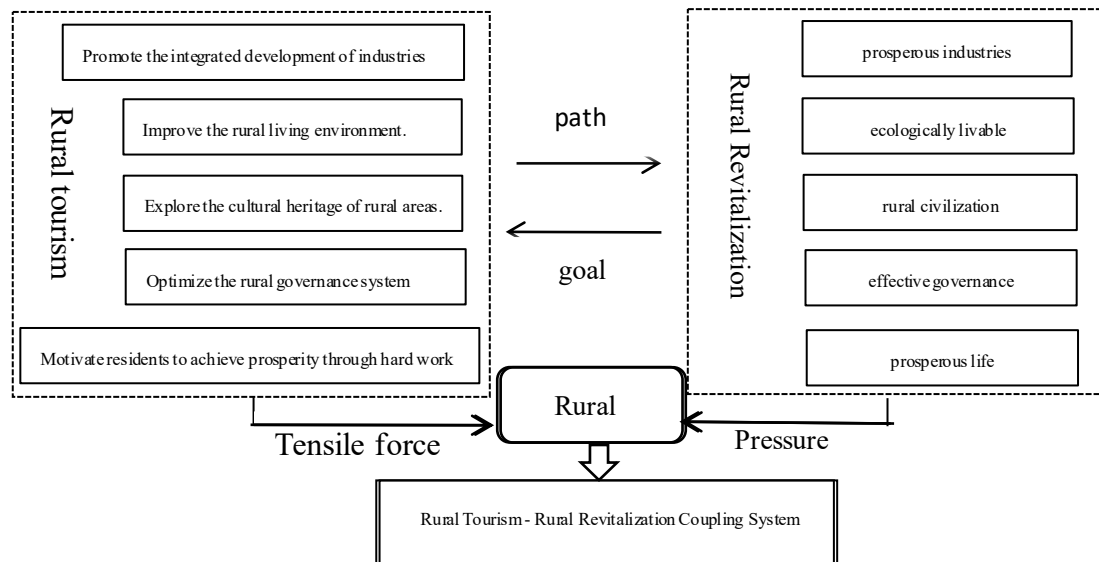
In the future, Chongqing should further deepen reforms to unlock the growth potential of rural property income and inject new impetus into rural revitalization. Meanwhile, it should also strengthen the coordinated development of rural tourism and rural revitalization, avoiding the blind pursuit of economic growth that damages the ecological environment and cultural landscape, and achieving high-quality development of rural tourism and positive interaction with rural revitalization.

### 4. Data sources

The "Statistical Yearbook" of Chongqing provides data on the overall economy of Chongqing as well as rural tourism, agriculture, and socioeconomic conditions in various districts and counties. The Rural Tourism Data Report of the Chongqing Municipal Culture and Tourism Bureau provides policy documents, annual reports, and tourism development data related to rural tourism.

The coupling mechanism of rural tourism and rural revitalization is shown in **Figure 1**. The comprehensive evaluation scores and coupling coordination degree of rural tourism and rural revitalization are shown in **Table 2**.





**Figure 1.** Coupling mechanism of rural tourism and rural revitalization

**Table 2.** Comprehensive evaluation scores and the coupling coordination degree of rural tourism and rural revitalization

Year	Rural Tourism (U1)	Rural Revitalization (U2)	Coupling Degree (C)	Coupling Coordination Degree (D)	Coordination Level
2014	0.440	0.340	0.992	0.390	Primary Coordination
2015	0.558	0.384	0.983	0.471	Primary Coordination
2016	0.605	0.372	0.971	0.489	Primary Coordination
2017	0.633	0.497	0.993	0.565	Intermediate Coordination
2018	0.715	0.552	0.992	0.633	Intermediate Coordination
2019	0.779	0.602	0.991	0.691	Good Coordination
2020	0.485	0.657	0.989	0.571	Intermediate Coordination
2021	0.581	0.712	0.995	0.646	Good Coordination
2022	0.621	0.758	0.995	0.689	Good Coordination
2023	0.768	0.770	1	0.769	Good Coordination

## 5. Result analysis

### 5.1. Analysis of overall development trends

As shown in the charts, from 2014 to 2023, the coupling coordination degree (D value) between rural tourism and rural revitalization in Chongqing achieved a leap from 0.622 (primary coordination) to 0.877 (good coordination). This overall monotonically increasing trend (except for the abnormal fluctuations in 2020) clearly reveals the continuous enhancement of the interactive relationship between the two systems and the sustained optimization of development quality, marking substantial progress made by Chongqing Municipality in coordinating rural industrial revitalization and overall development.

## **5.2. Analysis of development stages and characteristics**

### **5.2.1. Primary coordination stage (2014–2016)**

During this stage, the average coordination degree was below 0.70, indicating the early stage of synergistic development between the systems. During this period, the development level of rural tourism (U1) generally outpaced that of rural revitalization (U2), suggesting that although rural tourism had taken the lead in getting off the ground, its comprehensive driving effect on the rural economy, society, and environment had not yet been fully unleashed, and the positive mutual promotion mechanism between the two systems was still in the process of being established and refined.

### **5.2.2. Fluctuating adjustment and intermediate coordination stage (2017–2020)**

Starting from 2017, with the comprehensive implementation of the national rural revitalization strategy, policy dividends began to manifest, and the coordination degree steadily entered the intermediate coordination range (0.70–0.80), reaching good coordination (0.828) for the first time in 2019. This confirms the effectiveness of the policy of using rural tourism as an important lever for rural revitalization.

However, the coordination degree dropped to 0.751 in 2020, forming a critical observation point. Specific data shows that the rural tourism index plummeted (0.485) that year due to external shocks such as pandemic-related lockdowns, while the rural revitalization index maintained rigid growth (0.657) due to the broad scope of its involved areas and the continuity of policy support. This contrast exposes the inherent vulnerability of rural tourism as an outward-oriented economic sector, while also highlighting the greater resilience and stability of the rural revitalization system as a national strategy.

### **5.2.3. Consolidation and good coordination stage (2021–2023)**

Entering the “post-pandemic era”, the coordination degree rapidly recovered and stabilized at a good coordination level. By 2023, the development levels of the two systems have become extremely close ( $U_1=0.768$ ,  $U_2=0.770$ ), with the coordination degree reaching a peak of 0.877. This indicates that the two systems are no longer in a simple “industry-driven” relationship but have entered a new stage of high-level, balanced development characterized by deep integration and mutual empowerment between “industry and region.”

## **6. Recommendations and prospects**

### **6.1. Strengthen policy guidance and resource integration to establish a deep integration mechanism between rural tourism and rural revitalization**

To promote the deep coupling and coordination between the high-quality development of rural tourism and the rural revitalization strategy in Chongqing, the primary task is to strengthen policy guidance and clarify the intrinsic connections and complementary advantages between the two. The government should introduce a series of highly targeted and operationally feasible policy measures. Meanwhile, it is essential to deepen resource integration, fully leveraging rural natural landscapes, folk culture, specialty agriculture, and other resources to create a batch of rural tourism products with local characteristics<sup>[6]</sup>. Additionally, it is necessary to establish and improve a collaborative promotion mechanism for rural tourism and rural revitalization through regular joint meetings, the establishment of special working groups, and other forms.

## 6.2. Focus on talent cultivation and technological support to enhance the sustainable development capabilities of rural tourism and rural revitalization

Increase efforts to cultivate talents for rural tourism, enhancing the professional skills and service levels of rural tourism practitioners through various methods such as training sessions, on-site teaching, and distance education <sup>[13]</sup>. Meanwhile, encourage and support college graduates, returning migrant workers, and other groups to engage in rural tourism, injecting new vitality into the sector. In terms of technological support, actively introduce modern information technologies such as big data, cloud computing, and the Internet of Things to elevate the intelligent and informational levels of rural tourism, achieving precise management and efficient utilization of tourism resources <sup>[14]</sup>. Furthermore, strengthen the innovation and research and development of rural tourism products, developing a batch of rural tourism products with local characteristics, cultural connotations, and market competitiveness based on market demand and consumer preferences <sup>[15]</sup>.

## 6.3. Outlook

This study only analyzes the overall development of rural tourism in Chongqing Municipality and does not conduct separate analyses and calculations for each of the 38 county-level administrative regions. Consequently, the recommendations proposed lack strong pertinence. It is hoped that future research will incorporate spatiotemporal analysis to separately examine and provide recommendations for the 26 municipal districts, 8 counties, and 4 autonomous counties.

## Disclosure statement

The authors declare no conflict of interest.

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