



# Resilience Assessment of Ethnic Village Tourism Communities

## -Taking Ping'an Village as an Example

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**Abstract.** Since the 21st century, with the acceleration of China's urbanisation process, the living space of China's ethnic minority areas has become vulnerable and pathological under the impact of urbanisation and modernisation. This paper introduces the resilience theory into the study of ethnic village tourism community, constructs the resilience evaluation system of ethnic village tourism community from four dimensions: social, economic, ecological and cultural, and takes Ping'an Village in Longsheng County, Guilin City, Guangxi Province as a case study to measure and analyse the resilience of the tourism community of ethnic village. The results show that the resilience index of Ping'an Village is 5.24, reaching the medium resilience level, in which the highest ecological resilience index is 3.32, indicating that the ecosystem of Ping'an Village has strong resilience, which objectively reflects the environmental appropriateness of Ping'an Village and the validity of the ecological environmental protection; the economic resilience and cultural resilience indexes present medium resilience level, respectively 2. The weakest is 1.96, which is low resilience level. Toughness level, community labour force population, villagers' education level, village cadres' management ability, villagers' participation in governance, etc. are the main potential factors affecting the enhancement of the toughness level of Ping'an Village at present.

**Keywords:** Sustainable communities; Community resilience; Resilience assessment; Ethnic community

## 1 Introduction

Ethnic villages contain our country's excellent minority culture, is the material witness of the creativity and wisdom of the various ethnic groups, is the effective carrier of the mode of life and production, cultural traditions, customs and habits and external representations, is a complex system with a certain degree of resilience [1], as the basic governance unit of the village scale and the important carrier of rural revitalisation. With the frequent uncertainties and disturbances arising from the drastic changes in the external environment due to the continuous transformation of tourism development and

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human socio-political and economic development, the communities of ethnic villages are not only facing the weakening and decline of the social structure and vernacular culture, but also the challenges of the traditional live-lihood mode and the physical and ecological space [2]. The evolution of the concept of resilience originally originated from physics, which is used to describe the ability of a system to quickly restore equilibrium and stability after being disturbed. As disciplines continue to evolve at cross-purposes, scholars have expanded resilience into different academic fields [3]. The application of resilience theory in tourism research is still in the stage of conceptual introduction and theoretical exploration, the academic community for tourism community resilience research mainly focuses on disaster prevention and mitigation [8], tourism development [4][5], resilience governance[6], community vulnerability [7], and other research content is mainly; from the point of view of the research perspective, scholars for the study of the tourism community from the community of social subjects and residents of the main body of the two parts, for example In exploring the impact model construction of community participation on the impact of community resilience from the level of residents in tourist places [8], empowering the resilience enhancement of ethnic tourism communities with community building [9], and identifying the path of high-quality development of ethnic tourism communities [10]. In terms of research scale, existing studies mostly focus on a single scale such as cities and ordinary communities or residents under the large-scale perspective, and less on the resilience assessment research of ethnic villages under the background of special ethnic cultures. Therefore, this study selected Ping'an Village as a research case, from the theoretical perspective of community resilience, combined with the resilience characteristics of ethnic areas, to carry out empirical measurement and analysis of the resilience of ethnic village tourism communities, aiming at enriching the research on the sustainable development of ethnic villages and expanding resilience evaluation methods, and providing theoretical basis for the sustainable development of tourism communities in ethnic areas.

## **2 The Concept of Community Resilience in Ethnic Village Tourism**

Ethnic tourism refers to the process of satisfying the personal aesthetic needs of an ethnic group by experiencing its long history, culture and way of life and production in a variety of ways. Ethnic tourism emphasises the close experience between tourists and villagers, and between tourists and local ethnic characteristics and culture, and involves foreign visitors in the process through tourism activities. In this study, the ethnic village tourism community is defined as a unit of ethnic minority populations with obvious cultural characteristics and rich tourism resources through which tourism activities are carried out. The authors take the concept of 'resilience' as the basis of the study, and implant the concept of resilience into the sustainable development framework of the ethnic village tourism community, and define the resilience of the ethnic village tourism community as: in the face of the impact of external natural and social disturbances, the tourism community is able to effectively manage and make use of the environmental

and material resources, the social organisational structure, and the ethnic cultural traditions, ethnic industry resources in order to reduce external dependence and achieve rapid self-recovery and self-sufficiency.

### 3 Resilience Assessment Model Construction for Ethnic Village Tourism Community

This study used a questionnaire and literature review to collect data specific to the resilience of the study area and used the entropy weighting method (TOPSIS) to calculate a community resilience index. This process involves data normalisation, weight allocation and composite score calculation to arrive at a quantitative index of community resilience. TOPSIS avoids the subjectivity of human judgement.

#### 3.1 Selection of Evaluation Indicators

Ethnic village resilience system is a social-economic-ecological-cultural composite system, and its resilience system operation and maintenance process is also profoundly reflected in the resilience development of multiple dimensions, and a single perspective resilience assessment is difficult to thoroughly reveal the special and complex characteristics of resilience of ethnic village tourism communities. Combining the basic characteristics of resilience system such as reflexivity, robustness, redundancy, flexibility, diversity, inclusiveness, and integrity, the four dimensions of ethnic village tourism community are comprehensively measured. This paper adopts the Delphi consulting method and related literature, from the perspective of multi-perspective and multi-disciplinary intersections, selects 9 first-level sub-layer indicators with ethnic specificity and resilience common characteristics, based on the results of field research and policy documents, initially selects 32 second-level indicators, invites experts to organise discussions and vote for screening, and scores according to the degree of importance of each indicator, and ultimately obtains 23 second-level indicators under the sub-layer. The final 23 secondary indicators under the sub-tier were obtained. These included 18 positive and 4 negative indicators.

#### 3.2 Determination of Indicator Weights

The polarisation method is chosen for the study to transform the data. For negative data to be converted into positive data before polarisation. The transformed data are calculated through the entropy weight method to obtain the indicator weights. The specific steps are as follows: Dimensionlessness:

In the first step, the evaluation indicators were made dimensionless by:

$$X'_{ij} = (X_{ij} - \bar{X}_j) / S_j \quad (1)$$

Where  $X_{ij}$  is the initial evaluation indicator value;  $\bar{X}_j$  is the average value of the  $j$ th indicator;  $S_j$  is the standard deviation of the  $j$ th indicator.

In the second move, the coordinates of the indicators are panned to eliminate negative values:

$$X''_{ij} = K + X'_{ij} \tag{2}$$

Where  $X''_{ij}$ 's the value of the indicator value  $X'_{ij}$  fter coordinate translation, and  $K$  takes the value of 0 because the data of this study did not show negative values. In the third step, the weight  $R_{ij}$  of the indicator  $X''_{ij}$  is calculated:

$$R_{ij} = X''_{ij} / \sum_{i=1}^m X''_{ij} \tag{3}$$

In the fourth step, the entropy value  $e_j$  f the  $j$ th indicator is calculated:

$$e_j = -\left(\frac{1}{\ln m}\right) \sum_{i=1}^m R_{ij} \ln R_{ij} \tag{4}$$

In the fifth step, the coefficient of variation  $g_j$  is calculated for the  $j$ th indicator:

$$g_i = 1 - e_j \tag{5}$$

When the value of  $g_i$  is larger, the importance of indicator  $X_j$  in the comprehensive evaluation is stronger.

In the sixth step, the weight  $W_j$  of the indicator  $X_j$  is calculated:

$$W_j = g_j / \sum_{j=1}^n = (1 - e_j) / \sum_{i=1}^n (1 - e_j), j = 1,2,3, \dots n \tag{6}$$

In this paper, the Ping'an Village indicator data are weighted separately, and the average value of the data obtained is calculated to finally obtain the results of the Ping'an Village tourism community resilience indicator weight assignment, followed by a summary of the weights of the detailed indicator system.

**Table 1.** Evaluation index system of the resilience of ethnic village tourism communities

Dimension	Weights	Normative	Weights	Indicators	Weights	property
				Community labour share	0.044	+
				Educational attainment of villagers	0.061	+
		population structure (A)	0.121	Age structure of villagers	0.033	—
				Number of outworkers	0.067	—
				Village cadre management capacity	0.043	+

social (R1)	0.514	community governance (B)	0.115	Participation in village govern- ance	0.083	+
				Neighbourhood cohesion	0.054	+
				Sudden disaster events	0.043	—
economics (R2)	0.122	vulnerability (C)	0.184	Seasonal eco- nomic fluctua- tions	0.042	—
				Community tour- ism income	0.037	+
		industrial capital (D)	0.095	Agricultural in- dustry area	0.031	+
				Village employ- ment and income	0.088	+
		Economic di- versity (E)	0.134	Diversified eco- nomic structure	0.054	+
				Structure of farm household income	0.026	+
environ- ments (R3)	0.176	Built environ- ments (F)	0.091	Habitat satisfac- tion	0.039	+
				Climate comfort	0.029	+
		ecological situ- ation (G)	0.115	Waste disposal rate	0.018	+
				forest cover	0.028	+
				Soil quality landscape protec- tion	0.021 0.023	+
cultures (R4)	0.188	Heritage con- servation (H)	0.078	protection of agri- cultural heritage	0.030	+
				Traditional Cul- tural Heritage Utilisation	0.023	+
		cultural herit- age (I)	0.067	Traditional Build- ing Heritage Uti- lisation	0.025	+

Note: '+' in an attribute indicates a positive effect of the indicator, while a '-' negative effect of the indicator.

Each assessment indicator of the resilience of the ethnic village tourism community is divided into five levels and rated according to the degree of impact of each indicator on resilience. According to each indicator system layer on its resilience ability to score,

the higher the score means that the tourism community indicators content more resilience ability, performance is better. After establishing a score for each indicator and weighting it according to the relative weight of each indicator, the score for the indicator layer is multiplied by its weight, and the sum of the scores from the 23 indicator systems is summarised. This sum is then converted into a composite score of ten points, which results in the resilience score of the tourist community. A three-level categorisation of the resilience level of the ethnic village tourism community was also carried out, with scores of 0-3 (low resilience), 4-7 (medium resilience) and 8-10 (high resilience). The higher the assessment score, the higher the resilience level of the demonstrated ethnic village tourism community.

**Table 2.** Community Resilience Grading Criteria for Ethnic Village Tourism

Indicators		Grading criteria				
		Strongest	Relatively strong	Generally	Relatively weak	Extremely weak
quantitative	Community labour share	more than 80%	80%-60%	60%-40%	40%-20%	less than 20%
	Age structure of villagers	less than 10%	10%-15%	15%-20%	20%-35%	less than 30%
	Number of outworkers	less than 10%	10%-20%	20%-35%	35%-50%	less than 50%
	Community tourism income	more than 50%	35%-50%	20%-35%	10%-20%	less than 10%
	Agricultural industry area	more than 40%	40%-30%	30%-20%	20%-10%	less than 10%
	Diversified economic structure	more than 50%	35%-50%	20%-35%	10%-20%	less than 10%
	Climate comfort	comfortable	Relatively comfortable	general	not bad	Not comfortable
	forest cover	more than 80%	80%~60%	60%-40%	40%-20%	less than 20%
	Soil quality	class I	class II	class III	class IV	class V
	Structure of farm household income	more than 5 items	4 items	3 items	2 items	less than 1 items
Educational attainment of villagers	undergraduate or higher	professional college	secondary or high school	below junior high school	no education	

Qualitative	Participation in village governance	very good	better	general	poor	very poor
	Neighbourhood cohesion	very harmonious	more harmonious	general	discordant	very discordant.
	Sudden disaster events	great impact	more impact	general	little impact	no impact
	Seasonal economic fluctuations	great impact	more impact	general	little impact	no impact
	Habitat satisfaction	very satisfied	more satisfied	general	dissatisfied	very dissatisfied
	Landscape conservation integrity	very complete	relatively complete	general	not quite complete	incomplete
	Agricultural heritage conservation integrity	very complete	relatively complete	general	not quite complete	incomplete
	Traditional Cultural Heritage Utilisation	very good	better	general	poor	very poor
	Traditional Building Heritage Utilisation	very good	better	general	poor	very poor

**Table 3.** Assessment Result Rating and Description Table

Grade	Value range	State	Description
I	0-4	Low resilience	Communities are less resilient to risk and are prone to collapse when exposed to disturbances
II	4-8	Medium resilience	Communities are well resilient to risk and can respond briefly to disturbances without short-term collapse
III	8-10	high resilience	Community systems are fully resilient to risk and are stable and responsive to all risk disturbances

## **4 Empirical Evidence of Community Resilience Assessment in Ethnic Village Tourism**

### **4.1 Site Profiles and Data Sources**

Ping'an Village is located in the territory of Heping Township in the northeastern part of Longsheng Autonomous County, under the jurisdiction of Longsheng County, 30.6 kilometres away from Longsheng County. It is the core part of Longji Scenic Spot. Ping'an Village is also one of the earliest traditional villages for tourism development. After more than twenty years of tourism development, the village has greatly improved its various infrastructure construction, residents' economic income and community participation in governance, making it a typical representative of ethnic tourism. Its development model can provide development experience for ethnic villages of the same type, thus the study of the resilience coping capacity of Ping'an Village is more specific and representative.

### **4.2 Analysis of Evaluation Results**

By evaluating the characteristics of the elements of the ethnic village tourism community, specifically assigning values to each indicator system under the four dimensions of society, economy, environment, and culture, and calculating the weights of each indicator, the scores of the nine sub-dimensions are 2.87, 3.02, 1.58, 2.17, 2.61, 3.28, 2.55, 2.33, and 2.56, respectively, and combining with the weights of the sub-dimensions, the social, ecological, environmental, and cultural dimensions, the scores were 1.96, 2.98, 3.32, and 2.61, respectively. After considering the dimension level weights and converting them to a ten-point scale, the final score for the resilience of Ping'an Village's governance system was 5.24, indicating that its level of resilience is in the lower-middle range. This reflects that when Ping'an Village is disturbed, the community is more resilient to risks and can briefly cope without collapsing, but it is difficult to return to a stable state in the short term.

The ecological resilience score of Ping'an Village is 3.32, reaching the level of strong resilience. Its main factor lies in the good ecosystem conditions. The economic resilience score is 2.98. Tourism has a strong impact on the employment and income of the community villagers, the income is affected by seasonal changes and external emergencies, and the over-dependence on tourism also leads to an increase in economic vulnerability. The cultural resilience score is 2.61, with the highest value of contribution from the conservation and utilisation of traditional architecture in terms of heritage conservation and traditional cultural heritage conservation and utilisation. The social resilience score of 1.96 is a low resilience level, with the main limiting factor indicators being the impact of sudden-onset natural disasters and seasonal economic fluctuations on community vulnerability, and the demographics of the community are mainly represented by the high proportion of middle-aged and old-aged labour force, the high number of people going out to work, and the villagers' lack of sufficient voice in the process of community development.



## 5 Conclusions

This paper constructs a resilience evaluation system for ethnic village tourism communities, takes Ping'an Village as an empirical case, and determines its resilience level from the four dimensions of 'society-economy-environment-culture'. The results of the study show that the resilience index of Ping'an Village is 5.24, initially reaching the medium resilience level, in which the ecological resilience index is the highest, 3.32, which demonstrates that the ecosystem of Ping'an Village has strong resilience; the ecological-economic resilience and cultural resilience indices are 2.98 and 2.61, respectively; and the social resilience is the weakest, 1.96, which is at the low resilience level.

This paper organically combines resilience with the governance of villages with minority characteristics, and analyses the actual resilience deficiencies of the case sites with the resilience characteristic criteria in the empirical evidence. Due to the limitations of objective conditions, this study still has some shortcomings that need to be explored in future research. Although the samples selected for the study have a certain degree of representativeness, individual samples will still produce a certain degree of bias in the results of the study, and individual indicators are difficult to obtain in the actual research process, such as economic indicator data are difficult to obtain, making the conclusions of the study lack a certain degree of universality, and the future researcher can further improve the evaluation index system.

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