

Research on the Cooperative Development Mode of Rural Tourism Resorts — Taking Huangpu River Source Tourism Resort as an Example

Yunzhu Qu¹ & Kemin Wang¹

¹ Beijing Tsinghua Tongheng Urban Planning & Design Institute, China

Correspondence: Yunzhu Qu, Beijing Tsinghua Tongheng Urban Planning & Design Institute, China.

doi:10.56397/JWE.2023.09.09

Abstract

The Huangpu River Source Tourism Resort, situated within Anji County, Zhejiang Province, encompasses the administrative boundaries of Baofu Town, Zhangcun Town, and Hanggai Town. With the establishment of the resort's management committee, upper-level planning and coordination have gradually fallen into place, facilitating the full-scale construction of the resort. As a rural-oriented tourism destination aimed at fostering comprehensive development across these three townships, disparities are anticipated in terms of development foundations, tourism competitiveness, and development approaches. The purpose of this paper is to establish an evaluation index system for rural tourism competitiveness within the region. Utilizing factor analysis via the SPSS tool, it seeks to assess the strengths and weaknesses of each town's development factors, thereby evaluating the tourism development foundation and potential across the three towns. This endeavor aims to provide more effective guidance for the scientific construction and management of the Huangpu River Source Tourism Resort in Anji County and to explore a linked development model for the resort.

Keywords: Huangpu River source, rural tourism, cooperative development, factor analysis

1. Overview of the Study Area

The study area includes three townships in the southwest of Anji County, Huzhou City, Zhejiang Province, namely, Baofu, Zhangcun and Hanggai.

The total area is 522.6 square kilometers, of which 149.4 square kilometers are in Baofu, 108.2 square kilometers are in Zhangcun and 265 square kilometers are in Hanggai. The whole area shows the spatial pattern of high mountains in the southwest and low mountains in the

northeast, with the highest altitude of 1587.4 meters in Longwang Mountain. There are many streams and valleys in the resort area, and there are resources such as She culture, tea culture and red culture, which is a good place for summer vacation and parent-child study trip in the Yangtze River Delta region. Among them, Huangpu River Source — Longwang Mountain Nature Reserve is located in the southwestern part of Zhangcun, which is the most valuable tourism resource in the region. In addition to this, the tourism resources in Huangpu River

Source Resort are classified according to the Classification, Investigation and Evaluation of Tourism Resources (GB/T 18972-2017), with a total of: 8 main classes, 16 subclasses, 40 basic types, and 137 resource monoliths, based on which the tourism resources within the Huangpu River Source Tourism Resort are graded to facilitate subsequent resource evaluation.

2. Overview of Research Methods

In recent years, with the in-depth implementation of China's rural revitalization policy, the position of tourism in rural development has become increasingly significant, and the tourism competitiveness of rural tourist places has also become a hot area of research for many scholars. In 2021, Finland Yang and Shi Xiaozhen conducted a study on the competitiveness of rural tourism in Zhejiang Province using principal component analysis, and Anji County ranked third in the province in terms of the comprehensive score. The source area of Huangpu River is of great significance for the future development of Anji County, so the tourism competitiveness and influencing factors of the three towns and other areas with better tourism development are studied, so as to find out the joint development mode of the source area of Huangpu River.

3. Evaluation System Construction

Rural tourism is to take the location of the countryside as the destination, based on the existing resources with unique styles in the countryside, to provide leisure, sightseeing, entertainment, experience, and other activities for tourists, with the main target group of urban residents, especially those with high per capita disposable incomes, so as to make rural agriculture the primary industry and modern

services the tertiary industry, to carry out an It makes rural agriculture the primary industry and the modern service industry the tertiary industry to be effectively integrated, forming a new type of industry. (Review on the Development of Rural Tourism in China, Guo and Han, 2010). The Huangpu River Source Tourism Resort was opened not long ago, and as a key area for rural tourism development in Anji County, it is rich in tourism resources, but as a development consortium divided by administrative units, their respective development advantages and complementary resources have not yet been studied. The tourism development status of the three towns in Huangpu River Source Tourism Resort Area is analyzed using factor analysis and cluster analysis, which is specifically realized through SPSS. Referring to the construction of tourism competitiveness evaluation index system by related scholars, the evaluation system of "comprehensive index + elemental index" is constructed based on the principles of scientificity, accessibility and measurability of data. Among them, the comprehensive indicators include the competitiveness of resource products, service capacity, transportation development level, tourism market scale, socio-economic development level, and according to the characteristics of tourism development in rural areas, the cultural experience with rural characteristics, agritainment, campgrounds and so on will be included in the scope of the indicators; the elemental indicators are the specific evaluation indexes, and the selection of the indexes is decided by four aspects of the qualitative judgment, related research, research method/computer screening and data availability (Table 1).

Table 1.

Comprehensive indicators	factor index	
	selection indicators	-selection indicators
resource product competitiveness	World heritage, world geological parks, national scenic spots, national forest parks, national wetland parks, national geological parks, A-level scenic spots, nature reserves, characteristic folk culture, tourist resorts, high-level tourism resources and other resource scores	National Forest Park, A-level scenic spots, characteristic folk culture, fifth-level tourism resources, fourth-level tourism resources, third-level tourism resources

	Museums, theatres, public libraries, movie theaters	movie theaters
	Sports venues, per capita sports field area, ski resorts, large-scale sports events	Ski resorts, Rafting site, major sporting events
Service capabilities	Star-rated hotels, tourist homestays, room occupancy rates	High-end hotels, quality hotels, class boutique B&Bs, other boutique B&Bs
	Famous Chinese restaurants and agritainments	Agritainment
	campsite	campsite
Transportation development level	Total mileage of graded roads	/
	Class road network density	/
	highway mileage	Road mileage
	Highway turnover	/
Tourism Market Size	Annual visitor reception	Annual visitor reception
	Annual tourism income	Annual tourism income
	Proportion of tourism revenue in national economy	/
	The average growth rate of tourists and the average growth rate of tourism revenue in the past three years	The average growth rate of tourists in the past three years
Socioeconomic Development Level	GDP	GDP
	The average growth rate of regional GDP in the past three years	The average growth rate of regional GDP in the past three years
	The proportion of the tertiary industry in the national economy	/
	GDP per capita	/
	per capita disposable income	Per capita disposable income of rural residents

3.1 Data Source and Scoring Criteria

The data comes from the official website of Zhejiang Provincial Department of Culture and Tourism (<http://ct.zj.gov.cn/>), the 2022 Zhejiang Statistical Yearbook, and information related to the development of the tourism industry provided by the government departments of the three towns, and some of the data has been collated.

Considering the comparability and availability of data, as well as the specificity of tourism development in rural areas, the level of tourism development in the districts and counties is

examined with data from 2022. In addition, there are fewer studies on the three towns at the source of the Huangpu River, as well as in order to better study the competitiveness of each, another town of Dipu and Shanchuan, which has better tourism development in Anji County, are selected as a representative for simultaneous analysis.

Resource product competitiveness is assigned a comprehensive score, in which the resource product competitiveness of national forest parks 10 points, 15 points for five-level tourism resources, 10 points for four-level tourism resources, five points for three-level tourism

resources; characteristics of folk culture resources 8 points, 10 points for 4A-level scenic spots, 3A-level scenic spots, 6 points; cultural services 5 points for movie theaters; 10 points for rafting sites, 15 points for ski resorts, 15 points for international-level sports events, 10 points for national-level sports events. Tourism service capacity for the assignment of a comprehensive score, in which the

accommodation of high-end resort hotels 15 points, high-quality resort hotels 10 points; grade lodging, platinum lodging 15 points, gold lodging 10 points, silver lodging 5 points, boutique lodging 2 points; campgrounds 6 points; agritainment 3 points. The final data on the assignment of indicators were obtained as follows (Table 2):

Table 2.

Index	Baofu	Zhangcun	Hanggai	Shanchuan	Dipu
National Forest Park	0	10	10	10	0
AAAA level scenic spot	10	0	0	30	40
AAA level scenic spot	20	0	0	20	0
characteristic folk culture	8	8	0	0	0
Level 5 tourism resources	0	15	0	25	20
Level 4 tourism resources	20	10	20	30	25
Third level tourism resources	25	40	15	65	50
Rafting site	30	30	0	20	10
ski facility	15	15	0	15	0
major sporting events	15	10	10	15	10
Movie theaters	10	5	5	15	20
High end hotel	45	45	15	75	60
Quality Hotel	30	60	20	40	70
Level Boutique B&B	60	40	25	30	20
Other boutique homestays	38	20	2	34	16
camping base	6	48	12	54	36
Agritainment	219	147	237	303	270
Highway mileage	107.8	97.04	101.6	53	82
Annual visitor reception	135	42	12	180	200
Annual tourism income	4.7	2.9	2.5	13	12
The average growth rate of tourists in the past three years	8	5	20	14	12
GDP	4.7	5.5	13.2	38	38
The average growth rate of regional GDP in the past three years	4.4	8.5	8.6	4.3	3.2
Per capita disposable income of rural residents	3.38	3.97	3.8	4.8	5.4

3.2 Factor Analysis

The KMO test was conducted using SPSS software and the KMO value was found to be 0.679, indicating that the variables are suitable for factor analysis. Using SPSS software, two

principal components were extracted by principal component analysis and the matrix of principal component score coefficients for each town is shown in the following table (Table 3):

Table 3.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.551	48.131	48.131	11.551	48.131	48.131	7.583	31.595	31.595
2	6.316	26.316	74.447	6.316	26.316	74.447	5.743	23.930	55.525
3	3.642	15.174	89.621	3.642	15.174	89.621	5.678	23.659	79.184
4	2.491	10.379	100.000	2.491	10.379	100.000	4.996	20.816	100.000
5	1.213E-15	5.054E-15	100.000						
6	8.749E-16	3.645E-15	100.000						
7	4.763E-16	1.985E-15	100.000						
8	4.569E-16	1.904E-15	100.000						
9	3.841E-16	1.600E-15	100.000						
10	2.567E-16	1.069E-15	100.000						
11	2.187E-16	9.111E-16	100.000						
12	1.757E-16	7.321E-16	100.000						
13	1.362E-16	5.674E-16	100.000						
14	7.673E-17	3.197E-16	100.000						
15	3.388E-17	1.412E-16	100.000						
16	-5.582E-18	-2.326E-17	100.000						
17	-8.275E-17	-3.448E-16	100.000						
18	-1.459E-16	-6.079E-16	100.000						
19	-2.063E-16	-8.596E-16	100.000						
20	-3.210E-16	-1.337E-15	100.000						
21	-3.564E-16	-1.485E-15	100.000						
22	-9.005E-16	-3.752E-15	100.000						
23	-1.463E-15	-6.098E-15	100.000						
24	-1.882E-15	-7.841E-15	100.000						

Extraction Method: Principal Component Analysis.

Extracting the common factors yielded total variance explained values: the eigenvalue of the first principal factor was 11.551, explaining 31.595% of the total variance; the eigenvalue of the second principal factor was 6.316, explaining 55.525 of the total variance; and the eigenvalue of the third principal factor was 3.642, explaining 79.184% of the total variance of all five variables. Overall, there is less information loss of the original variables and the factor analysis is satisfactory.

The closer the absolute value of the factor

loading coefficients is to 1, the stronger the correlation between the variables and the factors. The data of this study were rotated using the maximum variance rotation method (varimax) in order to find out the correspondence between the factors and the study items. The above table shows the information extraction of the factors for the study items and the correspondence between the factors and the study items. From the above table, it can be seen that: all the study items correspond to a common degree value higher than 0.4, which means that there is a

strong correlation between the study items and the factors, and the factors can extract the information effectively. After ensuring that the factor can extract most of the information of the research items, the correspondence between the factor and the research items is analyzed (the absolute value of the factor loading coefficient is greater than 0.4, which means that the item and the factor have a correspondence).

Factor 1 has larger loading coefficients in fifth-level tourism resources, third-level tourism resources, high-end hotels, high-quality hotels, camping bases, highway mileage, annual tourism income, gross regional product and per capita disposable income of rural residents, which generally represents the development level of the local tourism base; Factor 2 has larger loading coefficients in the national forest

parcs, AAAA-level scenic spots, movie theaters, annual tourist reception, average growth rate of GDP for the past three years, which represents the local tourism base. Growth rate loading coefficient is larger, for the local tourism development potential; the third factor in the characteristics of folk culture, fourth-class tourism resources, rafting sites, grade boutique lodging, agricultural music and the average growth rate of the number of visitors in the past three years loading coefficient is larger, representing the local tourism characteristics of resources; the fourth factor in the AAA-level scenic spots, large-scale tourism events and other boutique lodging representation is stronger, can be regarded as the tourism ancillary development objects.

Table 4.

Rotated Component Matrix^a				
	Component			
	1	2	3	4
National Park	.340	-.915	.218	-.004
AAAA level scenic spot	.558	.773	.299	.031
AAA level scenic spot	.025	.193	.025	.981
characteristic folk culture	-.307	-.150	-.911	.231
Level 5 tourism resources	.980	.197	.023	-.024
Level 4 tourism resources	.313	.488	.721	.380
Third level tourism resources	.939	.277	.018	.203
Rafting site	.151	.006	-.843	.516
ski facility	.241	-.236	-.588	.735
major sporting events	.025	.193	.025	.981
Movie theaters	.471	.846	.248	.029
High end hotel	.785	.467	-.107	.393
Quality Hotel	.621	.415	-.449	-.490
Level Boutique B&B	-.458	-.009	-.638	.619
Other boutique homestays	.195	.321	-.389	.841
camping base	.981	-.140	-.122	-.047
Agritainment	.299	.455	.787	.291
Highway mileage	-.861	-.115	-.408	-.280
Annual visitor reception	.451	.832	.094	.310
Annual tourism income	.692	.601	.351	.190
The average growth rate of tourists in the past three years	-.163	-.141	.969	-.122

GDP	.678	.473	.561	-.044
The average growth rate of regional GDP in the past three years	-.250	-.899	-.110	-.342
Per capita disposable income of rural residents	.736	.498	.318	-.331
Extraction Method: Principal Component Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 8 iterations.				

Using the factor analysis method for weight calculation, the relationship equation between the factor and the study item (based on the standardized data to establish the relationship expression) was established using the “Matrix of component score coefficients (Table 5)” as follows.

Factor Score

$$1 = 0.250x_1 + 1.375x_2 + 2.500x_3 - 12.625x_4 - 2.859x_5 + 2.000x_6 - 0.125x_7 + 3.875x_8 - 4.000x_9 - 0.125x_{10} - 0.500x_{11} + 2.062x_{12} + 2.500x_{13} + 2.312x_{14} + 3.875x_{15} + 2.125x_{16} - 9.750x_{17} - 0.375x_{18} - 0.250x_{19} - 1.500x_{20} + 4.000x_{21} - 1.938x_{22} - 3.750x_{23} + 2.906x_{24}$$

Factor

$$2 = 0.250x_1 - 1.500x_2 - 0.156x_3 + 3.375x_4 - 0.938x_5 - 0.375x_6 + 0.375x_7 + 1.438x_8 - 1.500x_9 + 0.375x_{10} + 0.125x_{11} + 0.562x_{12} - 1.750x_{13} - 0.648x_{14} + 0.625x_{15} + 0.625x_{16} + 1.125x_{17} + 0.844x_{18} + 0.125x_{19} + 1.000x_{20} + 7.250x_{21} - 0.188x_{22} + 2.000x_{23} - 1.844x_{24}$$

Score

$$3 = 0.125x_1 - 3.188x_2 - 1.703x_3 + 1.250x_4 + 1.109x_5 - 3.000x_6 - 0.312x_7 - 1.438x_8 + 0.375x_9 - 0.312x_{10} + 1.375x_{11} - 0.219x_{12} - 1.125x_{13} - 3.422x_{14} - 2.312x_{15} + 2.375x_{16} - 1.250x_{17} - 0.125x_{18} + 3.125x_{19} + 1.000x_{20} + 1.9000x_{21} + 1.938x_{22} + 2.375x_{23} + 0.078x_{24}$$

Factor

$$4 = 0.125x_1 + 0.562x_2 - 2.641x_3 + 7.812x_4 + 2.781x_5 - 1.375x_6 - 0.125x_7 - 2.188x_8 + 3.625x_9 - 0.125x_{10} - 0.875x_{11} - 3.375x_{12} - 1.375x_{13} - 2.969x_{14} - 3.125x_{15} - 3.125x_{16} + 4.625x_{17} + 0.938x_{18} + 1.750x_{19} + 3.500x_{20} - 7.500x_{21} + 3.031x_{22} + 3.000x_{23} - 1.688x_{24}$$

Score

Table 5.

Component Score Coefficients Matrix

Index	Component			
	1	2	3	4
AAAA level scenic spot	0.250	0.250	0.125	0.125
Level 4 tourism resources	1.375	-1.500	-3.188	0.563
Level 3 tourism resources	2.500	-0.156	-1.703	-2.641
Rafting site	-12.625	3.375	1.250	7.813
ski facility	-2.859	-0.938	1.109	2.781
National Forest Park	2.000	-0.375	-3.000	-1.375
AAA level scenic spot	-0.125	0.375	-0.313	-0.125
characteristic folk culture	3.875	1.438	-1.438	-2.188
Level 5 tourism resources	-4.000	-1.500	0.375	3.625
major sporting events	-0.1	0.375	-0.313	-0.125
Movie theaters	-0.500	0.125	1.375	-0.875
High end hotel	2.063	-0.563	-0.219	-3.375

Component Score Coefficients Matrix

Index	Component			
	1	2	3	4
Quality Hotel	2.500	-1.750	-1.125	-1.375
Level Boutique B&B	2.313	-0.648	-3.422	-2.969
Other boutique homestays	3.875	0.625	-2.313	-3.125
camping base	2.125	0.625	0.125	-3.125
Agritainment	-9.750	1.125	2.375	4.625
Highway mileage	-0.375	0.844	-1.250	0.938
Annual visitor reception	-0.250	0.125	-0.125	1.750
Annual tourism income	-1.500	1.000	3.125	3.500
The average growth rate of tourists in the past three years	4.000	7.250	1.000	-7.500
GDP	-1.938	-0.188	1.938	3.031
The average growth rate of regional GDP in the past three years	-3.750	2.000	2.375	3.000
Per capita disposable income of rural residents	2.906	-1.844	0.078	-1.688

The composite score is calculated by accumulating the product of the variance explained (normalized) and the factor scores after rotation. The formula for the current data is:

$$(31.665 \times \text{Factor Score 1} + 23.828 \times \text{Factor Score 2} + 23.634 \times \text{Factor Score 3} + 20.873 \times \text{Factor Score 4}) /$$

100.000

$$\text{Final: } 0.317 \times \text{Factor Score 1} + 0.238 \times \text{Factor Score 2} + 0.236 \times \text{Factor Score 3} + 0.209 \times \text{Factor Score 4}$$

Substituting the male factor F1, F2, F3 and F4 scores into the total score function F, the results are shown in Table 6.

Table 6.

Town	F1	Ranking	F2	Ranking	F3	Ranking	F4	Ranking	Overall score	Ranking
Baofu	-7.641	5	-1.668	3	3.134	3	2.468	2	-1.561	3
Zhangcun	0.774	3	-4.281	4	-6.322	4	2.265	3	-1.796	4
Hanggai	-5.291	4	3.509	2	-10.359	5	3.909	1	-2.472	5
Shanchuan	7.687	1	11.114	1	3.872	2	-9.575	5	3.999	1
Dipu	4.471	2	-8.675	5	9.675	1	0.933	4	1.830	2

According to the data in Table 6, among the three towns of Huangpu River source, the town with the highest comprehensive score is the town of Baofu, followed by the town of Zhangcun, and the overall competitiveness of tourism development in Hanggai town is weak. Compared with Shanchuan and Dipu, there is still a certain gap, indicating that in the process

of construction and development of Huangpu River source tourism resort in the future, there is room for improvement in all aspects. Among them, Shanchuan is ranked first with 3.999 points, and except for the low score of F4, all other factors are at the top, which can be done as the representative area of tourism development in Anji County, indicating that its

comprehensive competitiveness is higher, while the advantages of Depu are far less prominent than Shanchuan although it is better than the development of Huangpu River source area.

According to the score ranking of F1, it can be seen that the score of the town of Baofu is -7.641, and the score of Hanggai town is -5.291, which are ranked in the fourth and the fifth place respectively, and there is a big difference between the score of the factor of the third place, which indicates that the level of the local tourism foundation development is not high, and it still needs to be perfected in terms of the tourism infrastructure and reception facilities of the higher and lower grades of the tourism resources, the hotels, the campsites, and the tourism transportation, etc.; in terms of the socio-economic development. In terms of socio-economic development, the development of tourism economy in Pingfu Township is relatively unsatisfactory, and the number of farmers participating in the tourism industry is also low. In Shanchuan and Dipu, where the tourism industry is better developed, their scores are relatively high.

The F2 factor scores of the source areas of the Huangpu River are all at a medium level, and Hanggai Township ranks second among the five areas, indicating that it has a high potential for tourism development, followed by Xianfu Township and Zhangcun Township. Although Shanchuan Township has a good foundation, its tourism development potential is still high due to its high-quality and unique tourism resources and is still in the rising period of tourism development. Dipu Township has a low potential for future tourism development because it is located in the county town and is affected by the development of the town.

Hanggai Town's F3 score is at the end of the list, and its tourism characteristic resources still need to be explored. Zhangcun and Baofu, on the other hand, are characterized by their characteristic folklore resources represented by the She culture. The characteristic resources of the remaining two places are based on a good foundation of existing development.

In the Factor 4 data, which represents the adjuncts of local tourism development, the Huangpu River source area scores low, indicating that the driving force of tourism development for local culture, sports, and farmers' employment is still limited at present.

4. Development Suggestion

As a rural tourism resort area jointly developed with a town-level administrative area, although it is still in the beginning stage of development within the county, and is lagging behind in the development of four major aspects: the basic level of tourism development, tourism development potential, tourism characteristics and resources and tourism ancillary development, exploring the respective strengths and weaknesses has become a basic idea to study the future development approach.

Among the three places, the overall development of the town has more significant advantages, and the level of tourism infrastructure is the most obvious disadvantage of the town. Therefore, the transformation of the local characteristic resources into the tourism industry and the provision of more high-quality hotels and other tourism infrastructures are the urgent needs to be improved in the town at the present time. Zhangcun Town has an average ranking of the four factors, i.e., there are no advantageous items and no obvious disadvantages, so it is the optimal strategy to carry out comprehensive enhancement here, and it is necessary to utilize the means of publicity and cultural fusion to create a tourism hotspot represented by Zhangcun Town, so as to attract tourists and drive the tourism development of the whole resort area. The lack of tourism characteristic resources in Hanggai Town restricts the development of the local area, but due to the large area, the future development potential is outstanding, and the tourism development appendage becomes its development advantage.

Comprehensively speaking, the layout of the future tourism resort development according to the development foundation, resource characteristics and advantages and disadvantages of the three towns is the most effective idea to guide the local tourism development. Playing well the characteristics of each town or even each village will be conducive to the future development, unlike the development of city-type tourist resorts, due to its economy is not developed enough, transportation is not convenient enough and other innate constraints, the development of rural tourist resorts for a long time, but in the context of reasonable complementary strengths and weaknesses, the future of tourism development in the three towns of the source of

the Huangpu River has a very bright future.

References

- Cuijuan Zhang, Xuejun Feng, Min Sheng. (2013). Factor analysis development steps and R language program code implementation. *Journal of Anqing Normal College (Natural Science Edition)*, (2), 28-31.
- Fang, S. M. & Lan, Y. B. (2017). Evaluation of tourism competitiveness of cities in West Hubei ecological and cultural tourism circle based on SPSS. *Journal of Hubei College of Arts and Sciences*, (11), 50-55.
- Guo Huancheng & Han Fei. (2010). An overview of rural tourism development in China. *Advances in Geoscience*, (12), 1597-1605.
- He Xiaoqun. (2012). *Modern methods and applications of statistical analysis*, 3rd edition. Renmin University of China Press.
- Kaiser H F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psychometrika*, 23(3), 187-200.
- The SPSSAU project (2023). SPSSAU. (Version 23.0) [Online Application Software]. Retrieved from <https://www.spssau.com>.