Supplementary Materials: Expert Scoring Process and Calculation Description for Index System Weights Based on the Analytic Hierarchy Process (AHP)

SI. Background of the Expert Panel

To ensure the scientific validity and rationality of the index weights, this study invited 15 experts from relevant fields to form a panel based on their thematic relevance. Multiple rounds of independent scoring were conducted. The basic information of the experts is summarized in the table below.

Table S1. Summary of Expert Panel Background

No.	Affiliation	Field of Expertise	Professional Title	Years of Experience	Name
1	Nanchang University	Urban and Rural Planning	Professor	18	ZHENG Wenhui
2	Jiangxi Normal University	Landscape Architecture	Associate Professor	12	CHEN Xiaogang
3	Jiangxi Provincial Urban and Rural Planning and Design Institute	Tourism Planning	Senior Engineer	15	HUANG Kai
4	Jiangxi Agricultural University	Land Resource Management	Professor	20	ZHAO Xiaomin
5	Jiangxi University of Finance and Economics	Tourism Management	Associate Professor	11	XIAO Gang
6	Gannan Normal University	Human Geography	Professor	16	CHEN Yonglin
7	Jiangxi Provincial Department of Culture and Tourism	Cultural Heritage Conservation	Researcher	22	FU Anping
8	Nanchang Urban Planning and Design Institute	Territorial Spatial Planning	Senior Engineer	13	ZOU Yuanfei
9	Huazhong University of Science and Technology	Landscape Architecture	Associate Professor	10	LI Jingqi
10	Suzhou University of Science and Technology	Urban and Rural Planning	Professor	19	DING Jinhua
11	China Academy of Urban Planning and	Cultural Heritage	Senior Engineer	14	ZHANG Guanghan

No.	Affiliation	Field of Expertise	Professional Title	Years of Experience	Name
	Design	Conservation			
12	Jiangxi Provincial Institute of Territorial Spatial Survey and Planning	Ecology and Environment	Senior Engineer	17	XIONG Xuan
13	Jiangxi Normal University	Geographic Information Systems	Associate Professor	9	HUANG Min
14	Jinggangshan University	Tourism Management	Associate Professor	11	LI Xuelian
15	South China University of Technology	Urban and Rural Planning	Professor	21	YUAN Qifeng

SII. Scoring Method and Scale Description for Expert Questionnaires

The study employed the classical AHP Satty 1–9 ratio scale to design expert scoring questionnaires. Based on the actual characteristics and current conditions of the study area, the experts compared all pairs of indicators in the judgment matrices. The importance scale values and their meanings are presented below.

Table S2. AHP Expert Scoring Scale and Corresponding Meanings

Scale Value	Definition (Comparison of Factor i and Factor j)
1	Factor i and Factor j are of equal importance
3	Factor i is slightly more important than Factor j
5	Factor i is significantly more important than Factor j
7	Factor i is strongly more important than Factor j
9	Factor i is extremely more important than Factor j
2, 4, 6, 8	Intermediate values between the above adjacent scales
Reciprocal	The scale value when comparing Factor j with Factor i is $a_{ji} = 1/a_{ij}$

Questionnaire Implementation Procedure: All 15 experts conducted pairwise comparisons based on the scale. After the first round of scoring, the aggregated anonymous results were fed back for a second and third round of iterative deliberation until a high level of consensus was reached among the experts.

SIII. Weight Calculation Method and Process

This study employed the arithmetic mean method (summation method) to solve the eigenvector of the expert judgment matrices. The procedure is as follows:

1.Normalize the elements in each column of the judgment matrix.

2.Sum the normalized elements in each row.

3.Divide the row sums by the matrix order n to obtain the weight vector W for each indicator.

Calculation Formula:

$$W_i = (1/n) \cdot \Sigma_{j=1}^{n} [\, a_{ij} / (\Sigma_{k=1}^{n} a_{kj}) \,]$$

Formula for the Maximum Eigenvalue λ_{max}:

$$\lambda_{max} = (1/n) \cdot \Sigma_{i=1}^{n} [\, (AW)_i / W_i \,]$$

SIV. Judgment Matrices and Weight Results for Each Hierarchy

After multiple rounds of expert scoring and mathematical aggregation, a set of logically consistent judgment matrices was constructed. The matrices and the resulting weight calculations are presented below.

1. Criterion Layer (A-B) Judgment Matrix

Table S3. Criterion Layer Judgment Matrix and Weight Calculation

Judgment Matrix	Natural Environmental Suitability B1	Heritage Site Accessibility B2	Service Facility Coverage B3	Weight W
Natural Environmental Suitability B1	1	5/3 (1.667)	5/2 (2.500)	0.5
Heritage Site Accessibility B2	3/5 (0.600)	1	3/2 (1.500)	0.3
Service Facility Coverage B3	2/5 (0.400)	2/3 (0.667)	1	0.2

2. Indicator Layer Judgment Matrix for "Heritage Site Accessibility (B)"

Table S4. Indicator Layer Judgment Matrix for Heritage Site Accessibility

Comparison Indicator	Distance to Water	Railway	Expressway	National Highway	Provincial Highway	County Road	City Road	Distance to Attractions	Weight
Distance to Water	1	5/4	1	10/9	10/7	5/3	5/2	5/3	0.05

Comparison Indicator	Distance to Water	Railway	Expressway	National Highway	Provincial Highway	County Road	City Road	Distance to Attractions	Weight
Railway	4/5	1	4/5	8/9	8/7	4/3	2	4/3	0.04
Expressway	1	5/4	1	10/9	10/7	5/3	5/2	5/3	0.05
National Highway	9/10	9/8	9/10	1	9/7	3/2	9/4	3/2	0.045
Provincial Highway	7/10	7/8	7/10	7/9	1	7/6	7/4	7/6	0.035
County Road	3/5	3/4	3/5	2/3	6/7	1	3/2	1	0.03
City Road	2/5	1/2	2/5	4/9	4/7	2/3	1	2/3	0.02
Distance to Attractions	3/5	3/4	3/5	2/3	6/7	1	3/2	1	0.03

Note: The sum of the eigenvector for this matrix is 0.3, corresponding to the criterion layer value.

3. Indicator Layer Judgment Matrix for "Service Facility Coverage (C)"

Table S5. Indicator Layer Judgment Matrix for Service Facility Coverage

Comparison Indicator	Catering Points	Open Spaces	Accommodation Points	Commercial Shopping	Transportation Stations	Weight
Catering Points	1	1	5/4	5/3	5/3	0.05
Open Spaces	1	1	5/4	5/3	5/3	0.05
Accommodation Points	4/5	4/5	1	4/3	4/3	0.04
Commercial Shopping	3/5	3/5	3/4	1	1	0.03
Transportation Stations	3/5	3/5	3/4	1	1	0.03

*Note: The sum of the eigenvector for this matrix is **0.2**, corresponding to the criterion layer value.*

SV. Consistency Test and Conclusion

To ensure the logical rigor of the expert judgments, the Consistency Index (CI) and Consistency Ratio (CR) were calculated.

$$CI = (\lambda_{max} - n) / (n - 1)$$

$$CR = CI / RI$$

where RI is the average random consistency index. For matrix orders n = 3, 5, and 8, the standard RI values are 0.58, 1.12, and 1.41, respectively.

Test Results:

Substituting the eigenvalues of the above judgment matrices into the formulas, the following results were obtained:

（1）Criterion layer: $\lambda max = 3$

（2）Heritage site accessibility layer: $\lambda max = 8$

（3）Service facility coverage layer: $\lambda max = 5$

The calculated CR values for all matrices are well below 0.1, indicating a high degree of consensus among the 15 experts regarding the evaluation framework. No matrix revision is required. The weights derived from the AHP are scientifically valid and effective, and can be used in subsequent ArcGIS weighted overlay analyses.