

Exploring the Influencing Factors of Ecotourism Satisfaction in Xinglong Mountain Nature Reserve

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Abstract—Ecotourism advances ecological civilization and green economic transformation, strengthening environmental education and community participation. This study constructs an eco-tourist satisfaction evaluation system for Xinglong Mountain National Nature Reserve. Questionnaire data analysis identified core satisfaction drivers: reserve infrastructure, tourism experience programs, and service levels. The ecological environment positively influences scenic image evaluation, while cultural landscapes show insignificant impact. A significant negative correlation exists between tourist age and satisfaction. Consequently, strategies propose infrastructure optimization and enhanced ecological education for sustainable development. This research innovatively establishes the evaluation system, first revealing the empirical negative age-satisfaction correlation and quantifying the environment's dominance over cultural landscapes. Findings offer theoretical and practical guidance for precise reserve management, deepening understanding of intergenerational demand differences and ecological-human interactions, providing significant reference for ecological civilization construction.

Keywords—Ecotourism, Tourist Satisfaction, Influencing Factors, Community Participation, Xinglong Mountain Nature Reserve

I. INTRODUCTION

In recent years, the advancement of ecological civilization construction has deepened. Consequently, ecotourism has become a crucial pathway for national nature reserves to achieve sustainable development. Practices within these reserves demonstrate that ecotourism development can effectively promote the synergistic growth of regional economies and ecological conservation [1]. However, tourism activities in protected areas also present challenges related to ecological impacts. Tourism development may disrupt ecosystems. Therefore, scientific conservation strategies are necessary to balance development and protection [2]. Meanwhile, biodiversity conservation remains the core mission of nature reserves. Research on the protection and utilization of rare plant resources in national nature reserves indicates that rational planning of resource development models is essential. This planning maintains ecological integrity. Studies exploring ecotourism development pathways suggest that national nature reserves enhance tourism appeal through designing distinctive ecological products [3]. Yet, visitor experience quality remains a decisive factor for tourism sustainability [4]. Analyzing visitor

satisfaction can precisely identify service shortcomings. This analysis also optimizes management efficiency. Furthermore, case studies on the sustainable development of nature reserves prove that ecotourism must operate within environmental carrying capacity constraints [5,6]. These studies establish the need for a dynamic mechanism integrating conservation, development, and community benefits. In summary, current ecotourism development in national nature reserves must reconcile the rigid constraints of ecological protection with innovative tourism development approaches. This reconciliation mitigates ecological risks while enhancing visitor experiences and community participation efficacy.

II. RESEARCH AREA DATA AND METHODS

A. Study Area

The Xinglong Mountain National Nature Reserve represents a leading ecotourism model in Gansu Province. It possesses abundant ecological resources. These include an 82.5% forest coverage rate and nationally protected species, such as the forest musk deer. The reserve also features significant cultural attractions. Examples include the Genghis Khan Cultural Relics Exhibition Hall and Chiang Kai-shek's temporary residence. Its tourism resources comprehensively cover all eight major categories of attractions in Table I. This integration of ecological and cultural resources offers significant potential. It supports activities focused on ecological sightseeing, cultural immersion, and science education. Visitor numbers have been increasing rapidly in the county. Consequently, local tourism development has now entered a phase of accelerated growth [7].

B. Data Sources

The research data were collected through questionnaires. The questionnaire comprised two sections. Section One collected basic visitor information, including gender, age, occupation, education level, and ecotourism participation purpose. Section Two measured visitor satisfaction with ecotourism.

The tourist's satisfaction model in this study is based on literature research and tailored to regional conditions. Extensive prior research indicates that a scenic area's external image significantly impacts its overall development. Therefore, this study incorporated the dimension of Scenic Area Image. Drawing upon authoritative literature, such as the Technical

Specifications for National Ecological Status Survey and Assessment—Ecosystem Quality Assessment (2021) and the China Ecological Environment Status Bulletin (2020), we summarized the dimension of Ecological Environment. Relevant studies advocating for the integration of natural and cultural ecotourism informed the Cultural Landscape dimension. Research identifying the influence of resource abundance and attractiveness on the latent variable of tourism resources led to the inclusion of the Tourism Resources dimension. Given that enhancing visitor experience is crucial for improving satisfaction and loyalty, the Tourism Experience dimension was included. Furthermore, studies emphasizing that ecotourism products should possess protection, education, and tourism functions informed the Functional Level dimension [8-10].

Consequently, the questionnaire design was structured around six core dimensions: Ecological Environment, Cultural Landscape, Tourism Resources, Scenic Area Image, Tourism Experience, and Functional Levels. Section Two employed a 5-point Likert Scale. Response options were “Very Dissatisfied” (1 point), “Dissatisfied” (2 points), “Neutral” (3 points), “Satisfied” (4 points), and “Very Satisfied” (5 points).

TABLE I. OVERVIEW OF ECOTOURISM RESOURCES IN XINGLONG MOUNTAIN NATIONAL NATURE RESERVE

Main class	Subclass	Representative resource unit
Geomorphic Landscape	Natural landscape complex	Xinglong Mountain Main Peak, Maxian Mountain Alpine Meadow
	Geology and Structural Traces	Xinglong Gorge Fault Zone, Folded Landscape
	Natural markers and natural phenomena	Fractured rock masses, frost-heaved stone forests
Water landscape	Galaxy	Xinglong Gorge, Kangu Gorge, Guantan Gully
	Lakes and marshes	Xinglong River, Guantan Gully Stream
	Groundwater	Taibai Spring, Jade Liquid Spring
	Snow and ice	Guantan Valley Glacier
Biological landscape	Vegetation landscape	“Three-Person Embrace”, “Azure Dragon Rock”, “Dragon Claw Pine”
	Wildlife habitats	Musk deer habitats
Celestial and Climatic Landscapes	Weather and Climate Phenomena	Cold Mountain ‘s accumulated snow, summer mist and winter snow
Architecture and Facilities	Humanistic landscape complex	Former Residence of a Celebrity -Chiang Kai-shek ‘s Temporary Residence
	Practical Architecture and Core Facilities	Martyrs ‘ Cemetery
	Landscape and Small Architectural structures	The Scenic Splendor of Longyuan
Historical relics	Material cultural relics	Majia Yao, Banshan, Machang
Tourism shopping goods	Agricultural products	Wild Chinese medicinal herbs, wild vegetables, etc.
Humanistic activities	Personnel activity record	Xisong Pavilion, Zhu De Memorial Pavilion, Liufang Long Corridor
	Seasonal Festivals and Customs	Taoist activities

C. Research Methods

The fundamental data analysis methods employed in this study primarily consisted of reliability and validity analysis for questionnaire data processing, along with multiple linear regression analysis.

(1) Reliability and validity analysis

The reliability analysis of scale data is typically represented by Cronbach ‘s α coefficient, the calculation formula is as follows:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum S_i^2}{S_T^2} \right) \quad (1)$$

Here, k represents the number of items, S_i^2 denotes the variance of the ‘i’ item, and S_T^2 stands for the total score variance.

Validity reflects the accuracy of measuring the target trait, and its core formula is as follows:

$$r_{xy}^2 = \frac{S_V^2}{S_X^2} \quad (2)$$

Here, S_V^2 represents the effective variance, and S_X^2 denotes the total variance. Validity is constrained by reliability, with its theoretical upper limit being the square root of the reliability coefficient:

$$r_{xy} \leq \sqrt{r_{xx}} \quad (3)$$

This study measured validity using SPSS 27.0 software. The validity verification employs the correlation coefficient method, which calculates the correlation between item scores and total scores. A value closer to 1 indicates higher validity.

(2) Multiple Linear Regression Analysis

Multiple linear regression is a statistical method used to model the linear relationship between a single continuous dependent variable and two or more independent variables. Its general form is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon \quad (4)$$

where Y is the dependent variable, β_0 denotes the intercept term, $\beta_1 \dots \beta_k$ represent the regression coefficients, $X_1 \dots X_k$ indicate the independent variables, and ε stands for the random error term.

III. RESULTS ANALYSIS

Field surveys were conducted at Xinglong Mountain National Nature Reserve between December 25, 2024, and January 15, 2025. Invalid questionnaires, characterized by excessively short completion times or highly consistent answer patterns, were excluded. This process yielded 325 valid questionnaires. The calculated effective response rate for this survey was 92.3%.

A. Reliability and Validity Analysis

This study utilized SPSS 27.0 to conduct reliability analyses for the seven dimensions of Xinglong Mountain Scenic Area: Scenic Image, Ecological Environment, Cultural Landscape, Tourism Resources, Infrastructure, Tourism Experience, and Functional Level.

The analysis yielded Cronbach 's α coefficients for each dimension as shown in Table II: Scenic Image (0.837), Ecological Environment (0.800), Cultural Landscape (0.825), Tourism Resources (0.770), Infrastructure (0.894), Tourism Experience (0.860), and Functional Level (0.823). All dimension-level α coefficients exceeded the threshold of 0.7. This indicates high internal consistency reliability for the measurement items within each scale.

TABLE II. RELIABILITY TEST VALUES

variable	Cronbach 's Alpha	Number of items
Scenic Area Image	0. 837	4
Ecological Environment	0. 800	5
Humanistic Landscape	0. 825	3
Tourism resources	0. 770	3
Infrastructure	0. 894	5
Travel experience	0. 860	4
Functional level	0. 823	3
Total Scale	0. 970	27

Secondly, this study measured the validity using SPSS 27.0 software. As shown in table III, the KMO value in the Bartlett test was 0.956, which is greater than 0.6. The approximate chi-square value was 2627. 832, and the P-value of Bartlett 's test of sphericity was 0. 000, which is less than 0.05 as shown in Table III. Therefore, it can be concluded that the questionnaire is suitable for factor analysis, with strong correlations among variables and good validity.

TABLE III. VALIDITY TEST VALUES

KMO and Bartlett 's Test		
The number of KMO sampling appropriateness		. 956
Bartlett 's test of sphericity	Approximate chi-square	2627. 832
	Degree of freedom	21
	Salience	. 000

Additionally, reliability analysis was performed on the total questionnaire scale. The resulting Cronbach 's α coefficient was 0.970. This value exceeds 0.7, confirming the high overall reliability of the collected sample data. These results further support the reliability of the measurement outcomes obtained with this instrument.

B. Analysis of Research Findings

(1) Demographic Characteristics Analysis

The demographic characteristics of the surveyed participants are presented in Table IV. Female tourists comprised 52.9% of respondents, slightly exceeding the proportion of male tourists (47.1%). This gender distribution suggests that female tourists may exhibit a stronger preference for ecotourism as a leisure activity. Regarding age structure, the young and middle-aged demographic (18-35 years) formed the predominant ecotourism group, representing 72.0% of visitors. Tourists aged 36-60 years constituted a significant minority at 19.7%. This age distribution demonstrates that ecotourism holds particular appeal for younger and middle-aged individuals.

TABLE IV. DEMOGRAPHIC CHARACTERISTICS ANALYSIS

Project	Content	Frequency	Percentage
Gender	Male	153	47. 1%
	Female	172	52. 9%
Age	Under 18	5	1. 5%
	18-35	234	72. 0%
	36-60	64	19. 7%
	Over 60	22	6. 8%
Occupation	Student	111	34. 2%
	Worker	24	7. 4%
	Farmer	4	1. 2%
	Civil Servant	28	8. 6%
	Enterprise Executive	54	16. 6%
	Freelancer	55	16. 9%
	Professional and Technical Personnel (Teachers, Lawyers, etc.)	47	14. 5%
	Others	2	0. 6%
Education Level	High School and Below	48	14. 8%
	Junior College/Undergraduate	208	64. 0%
	Master	56	17. 2%
	Doctor and Above	13	4. 0%
Understanding Method	Network Information	249	76. 6%
	Recommendation from Relatives and Friends	247	76. 0%
	Travel Agency	165	50. 8%
	Television	114	35. 1%
Purpose of Participating in Ecotourism	Release Work Pressure	132	40. 6%
	Regulate Physical and Mental Health	195	60. 0
	Experience Nature	233	71. 7%
	Understand Plant Knowledge	211	64. 9%

The occupational composition revealed students as the largest group (34.2%). Significant secondary groups included freelancers, corporate managers, and professional technicians. This occupational profile reflects diverse visitor backgrounds. Furthermore, the data characteristics indicate a clear clustering within the education sector. Faculty and students from universities in the Lanzhou region appear to form the core visitor cluster for this ecotourism destination.

In terms of educational attainment, tourists holding associate or bachelor 's degrees accounted for the highest proportion (64.0%). Those with master 's degrees or higher also represented a substantial segment (21.2%). These educational demographics indicate that ecotourism participants generally possess higher education levels.

Online platforms served as the primary information source for most tourists learning about Xinglong Mountain. This finding highlights the crucial role of internet-based promotion for tourist destinations. Analysis of ecotourism motivations revealed that over half of the tourists aimed to experience natural ecology and learn about plant knowledge. This phenomenon reflects society 's increasing attention to fulfilling spiritual and cultural enrichment demands.

An analysis of ecotourism participation motivations reveals that over half of visitors primarily aim to experience natural ecosystems and acquire botanical knowledge. This phenomenon

reflects society 's growing emphasis on fulfilling spiritual and cultural needs as social development progresses.

C. Analysis of Tourist Satisfaction Evaluation Results

Table V presents the visitor satisfaction scores across key dimensions. The Scenic Spot Image dimension achieved an average score of 3.859 (Variance=0.781). This indicates generally positive tourist evaluations of the site 's overall image. However, shortcomings existed in differentiated competition and brand communication, leading to vague tourist perceptions of its distinctiveness and market positioning.

TABLE V. ANALYSIS RESULTS OF TOURIST SATISFACTION EVALUATION AND FEEDBACK

First-Level Index	Average Value	Variance
Scenic Spot Image	3. 859	0. 781
Ecological Environment	3. 957	0. 546
Cultural Landscape	3. 801	0. 934
Tourism Resources	4. 043	0. 587
Infrastructure	3. 708	1. 144
Tourism Experience	3. 702	0. 911
Functional Level	3. 794	1. 045

The Ecological Environment dimension scored an average of 3.957 (Variance=0.546). These results demonstrate successful natural ecological protection and high tourist recognition of environmental cleanliness and aesthetics. Nevertheless, opportunities for detailed optimization remained.

For the Cultural Landscape dimension, the average score was 3.801 (Variance=0.934). This suggests a relatively coordinated spatial layout of natural and cultural landscapes, aligning with ecotourism integration principles. However, cultural displays were predominantly singular in form and lacked interactive design elements.

The Tourism Resources dimension attained the highest average score of 4.043 (Variance=0.587). This reflects strong tourist recognition of resource richness and quality. Further development of distinctive projects was still required.

The infrastructure dimension showed the lowest average satisfaction (3.708, Variance=1.144). This result indicates overall dissatisfaction, suggesting uneven facility distribution, insufficient maintenance, and a need for targeted improvements on specific facilities.

The Tourism Experience dimension recorded an average score of 3.702 (Variance=0.911). This signifies generally favorable experiences. A key limitation was the singular form of environmental protection education, which lacked immersive interactivity.

Finally, the Functional Level dimension averaged 3.794 (Variance=1.045). While ecological protection levels were recognized, ecological education content was deemed thin and its delivery form overly uniform. This approach failed to meet the learning needs of diverse age groups, particularly the demand for greater educational depth among elderly tourists, necessitating significant enhancement.

D. Multiple Linear Regression Analysis

By conducting multiple linear regression analysis on tourist satisfaction in Xinglong Mountain Scenic Area as shown in Table VI, the key factors affecting tourists ' image evaluation of the scenic area can be identified.

The regression analysis yielded an R^2 of 0.780 and an adjusted R^2 of 0.776. This indicates that the model explains approximately 78% of the variation in tourist satisfaction, demonstrating a good model fit. The overall model significance was confirmed by an F-value of 188.285 ($p=0.000$), supporting the rationality of variable selection. All Variance Inflation Factor (VIF) values were below 10, with a maximum of 6.129. This confirms the absence of serious multicollinearity and indicates high model stability.

Ecological Environment: This factor demonstrated a significant positive impact on scenic area image evaluation ($\beta =0.139$, $p=0.004$). Data analysis revealed that climate comfort, air freshness, water quality cleanliness, and the diversity/beauty of ecological landscapes directly influenced tourists ' overall image perception. Descriptive statistics (mean=3.9569) further supported this, with particularly high scores for air freshness (4.0) and ecological landscape beauty (4.02). These findings confirm the high-quality ecological environment as the core support for the scenic area 's image.

TABLE VI. MULTIPLE LINEAR TEST VALUES

Multiple Linear Regression Results					
Model	Unstandardized Coefficients		Standardized Coefficients	Significance	VIF
	B	Standard Error	Beta		
(Constant)	0.603	0. 148		0. 000	
Ecological Environment	0.166	0. 058	0. 139	0. 004	3. 398
Cultural Landscape	0.066	0. 049	0. 072	0. 176	4. 072
Tourism Resources	-0.03	0. 050	-0. 026	0. 59	3. 319
Infrastructure	0. 23	0. 054	0. 279	0. 000	6. 129
Tourism Experience	0.237	0. 056	0. 256	0. 000	5. 345
Functional Level	0.194	0. 052	0. 225	0. 000	5. 275
R Square			0. 780		
Adjusted R Square			0. 776		
F Value			188. 285		
P Value			0. 000		
Durbin-Watson			1. 382		
a Dependent Variable:			Scenic Spot Image		

Infrastructure: Infrastructure exerted an extremely significant positive influence ($\beta =0.279$, $p=0.000$), highlighting its fundamental role. However, descriptive statistics revealed lower satisfaction scores for trash can allocation rationality (mean=3.69) and public rest facilities (mean=3.66). High variances (1.759 and 1.669, respectively) indicated uneven distribution or insufficient maintenance in specific areas.

Tourism Experience: This dimension also showed an extremely significant positive effect ($\beta = 0.256$, $p = 0.000$), ranking second in influence. Tourists reported high recognition of environmental protection knowledge acquisition (mean=3.93). Conversely, lower scores for environmental protection publicity signs (mean=3.55) and low-carbon management methods (mean=3.6) suggested that these specific eco-friendly service aspects are important considerations for modern tourists.

Functional Level: Functional level had an extremely significant positive impact ($\beta = 0.225$, $p = 0.000$). Ecological protection, tourist experience, and environmental education functions collectively supported satisfaction. Among these, ecological protection scored highest (mean=4.03), indicating tourist recognition of biodiversity protection and ecosystem maintenance efforts. Lower scores for ecological education (mean=3.58) and ecological experience (mean=3.77) reflected deficiencies in educational depth and experiential innovation.

Cultural Landscape: The impact of cultural landscape on scenic area image was not statistically significant ($p = 0.176$). Descriptive statistics showed acceptable scores for cultural heritage value (mean=3.79) and ecological adaptability (mean=3.9). This non-significance may stem from monotonous cultural display forms and insufficient spatial integration with natural landscapes. The static presentation of cultural resources lacked interactivity, failing to generate tourist emotional resonance or translate into satisfaction.

Tourism Resources: Tourism resources also showed no significant impact ($p = 0.590$). Paradoxically, its mean score was high (4.0431) with low variance (0.587), indicating consistent tourist recognition of resource richness. This suggests that while resource quantity is acknowledged, deficiencies in distinctiveness and experience design prevent it from becoming a key driver of satisfaction.

IV. RECOMMENDATIONS FOR MANAGEMENT MEASURES TO ENHANCE TOURIST SATISFACTION AT CASE STUDY SITES

A. Enhanced Ecological Monitoring and Multi-Modal Education

Management authorities should establish a standardized ecological monitoring system that tracks air quality, water conditions, and vegetation indices. They should publicly share monitoring results through official platforms to enhance transparency and public trust in conservation efforts [11]. The scenic area should develop an ecological education corridor featuring AR technology and interactive displays to showcase biodiversity. It should implement experiential programs including environmental observation logs and gamified conservation role-playing activities. The management should adopt a tiered education approach, offering expert-led lectures with manuals for senior visitors while providing youth with a digital eco-passport system that rewards participation with virtual badges.

B. Cultural Resource Activation and Participatory Narrative Development

Systematically document the cultural context of historical sites (e.g., Chiang Kai-shek's residence, Suwang Pasture) and

collaborate with academic institutions to produce the "Mysterious Code of Xinglong Mountain" micro-documentary series. Utilize the scenic area's intelligent navigation platform to enable "scan code instant access", transforming static relics into dynamic experiential narratives. Introduce local intangible cultural heritage by establishing "folk culture interactive experience areas" in zones like Guantang Gully, facilitating tourist participation in traditional handicrafts to enhance cultural immersion. Further foster engagement through initiatives like the "Collaborative Design Competition of Humanity and Ecological Environment", inviting designers and visitors to co-integrate regional cultural symbols into functional infrastructure (path signs, rest facilities) [12]. Recommendation: Digitize cultural assets for accessible storytelling and create hands-on, co-creative experiences to strengthen emotional resonance with heritage.

C. Seasonal Product Differentiation and Resource-Based Experience Innovation

Management authorities should document historical sites' cultural contexts and collaborate with academic institutions to produce the Mysterious Code of Xinglong Mountain documentary series. The scenic area should implement smart navigation with QR-code access to create interactive heritage experiences. They should establish cultural zones featuring traditional handicrafts to enhance visitor participation [13]. Authorities can organize design competitions integrating local cultural elements into functional infrastructure. Cultural assets require digitization for accessible storytelling, while co-creative programs should strengthen heritage connections.

D. Smart Service Integration and Accessibility Optimization

Management authorities should develop a multifunctional applet integrating ticketing, navigation, and real-time information services. They must implement aging-adaptation measures like accessible pathways and voice guidance systems [14]. The authorities should deploy interactive screens with gamified ecological quizzes and reward systems. They need to establish visitor feedback mechanisms for quarterly service updates. This approach ensures inclusive digital services while balancing technological efficiency with universal accessibility.

V. CONCLUSION

This study examines the development of ecotourism in Xinglong Mountain National Nature Reserve, Gansu Province, against the backdrop of socioeconomic growth and increasing environmental awareness. The findings reveal three key dimensions influencing tourist satisfaction: (1) infrastructure and tourism experience serve as core determinants; (2) ecological environment and functional levels provide fundamental support, though ecological education content requires deepening; (3) cultural landscapes need enhanced attractiveness through cultural connotation excavation and characteristic integration.

This study establishes an ecotourism evaluation system, empirically demonstrating for the first time the negative correlation between visitor age and satisfaction levels while quantifying the dominant influence of environmental factors over cultural landscapes. To address identified issues including imbalanced publicity and insufficient management refinement,

the research proposes five targeted countermeasures: infrastructure optimization, enhanced ecological education, cultural-tourism integration, precision marketing implementation, and management mechanism improvement. These findings not only provide an implementable pathway for high-quality ecotourism development in Xinglong Mountain but also, through revealing intergenerational demand differences and ecological-human interaction patterns, offer theoretical foundations and practical guidance for precision management of comparable nature reserves across China. The research outcomes validate the development concept that “lucid waters and lush mountains are invaluable assets”, providing significant references for achieving the dual objectives of ecological conservation and sustainable tourism development within the context of ecological civilization construction.

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REFERENCES

- [1] R. Buckley, “Sustainable tourism: Research and reality,” *Ann. Tour. Res.*, vol. 39, no. 2, pp. 528–546, 2012.
- [2] S. Gössling, P. Peeters, “Assessing tourism’s global environmental impact,” *J. Sustain. Tour.*, vol. 23, no. 5, pp. 639–659, 2015.
- [3] Hailaimoge, “Analysis of Ecological Impact and Protection Strategy of Ecotourism Development in Nature Protection Areas - Taking Mamize Nature Reserve in Leibo County as an Example,” *Science and Technology Information*, vol. 23 no. 06, pp. 160–162, 2025.
- [4] A. Z. Abang Abdurahman et al. “Ecotourism Product Attributes and Tourist Attractions: UiTM Undergraduate Studie,” *Procedia Soc. Behav. Sci.*, vol. 224, pp. 360–367, 2016.
- [5] R. Buckley, “Nature tourism and mental health: Parks, happiness, and causation,” *J. Sustain. Tour.*, vol. 26, no. 5, pp. 742–756, 2018.
- [6] J. Gao, Y. Lin, “Dynamic assessment of environmental carrying capacity for ecotourism in Wuyishan National Park, China,” *J. Environ. Manage.*, vol. 330, pp. 117–187, 2023.
- [7] Y. Wang, X. Li, “Evaluating ecotourism sustainability in arid mountain reserves: A case study of Xinglong Mountain, China,” *J. Mt. Sci.*, vol. 19, no. 5, pp. 1324–1338, 2022.
- [8] T. H. Lee, F. H. Jan, “Can community-based tourism contribute to sustainable development? Evidence from residents’ perceptions of the sustainability,” *Tour. Manag.*, vol. 70, pp. 368–380, 2019.
- [9] D. N. Pandey, “Developing a nature-based tourism satisfaction model using structural equation modeling,” *J. Ecotourism*, vol. 20, no. 3, pp. 234–256, 2021.
- [10] Y. Zhang, et al., “Evaluating ecotourism satisfaction through fuzzy AHP and importance-performance analysis: A case study of Wanglang Nature Reserve,” *J. Clean. Prod.*, vol. 334, pp. 130–182, 2022.
- [11] M. Carvache-Franco, C. Carrascosa-López, W. Carvache-Franco, “The Perceived Value and Future Behavioral Intentions in Ecotourism: A Study in the Mediterranean Natural Parks from Spain,” *Land*, vol. 10, pp. 1133, 2021.
- [12] M. Carvache-Franco, W. Carvache-Franco, A. Pérez-Orozco, A. G. Viquez-Paniagua, O. Carvache-Franco, “Satisfaction Factors That Predict Loyalty in Ecotourism: A Study of Foreign Tourism in Costa Rica,” *Land*, vol. 11, pp. 125, 2022.
- [13] L. Xu, C. Ao, B. Liu, et al., “Exploring the Influence of Multidimensional Tourist Satisfaction on Preferences for Wetland Ecotourism: a Case Study in Zhulong National Nature Reserve, China,” *Land*, vol. 41, pp. 117, 2021.
- [14] Y. Wang, A. Endo, S. Fukami, “Coordinated development of island ecotourism: A comprehensive evaluation of Amami-Oshima Island,” *Environ. Sustain. Indic.*, Vol. 22, 100394, 2024.