

Article

Study on the Key Influencing Factors and Indicators of Well-being Among Ethnic Minority Residents Related to Cultural Differences in Recreational Fisheries

Zhi-Hong Yang^{1,2}, Ta-Jen Chu^{1,2,†,*} and Chun-Han Shih^{3,*}

¹ Fisheries College, Jimei University, Xiamen 361021, China; 906032014@qq.com (Z.-H. Y.); chutajen@gmail.com (T.-J. C.)

² Fujian Provincial Key Laboratory of Marine Fishery Resources and Eco-Environment, Jimei University, Xiamen 361021, China

³ Department of Leisure & Tourism Management, Shu-Te University, Kaohsiung 824, Taiwan; f92b45028@ntu.edu

* Correspondence: chutajen@gmail.com; f92b45028@ntu.edu; Tel.: +86-187-0508-3198

† These authors contributed equally to this work.

Received: Dec 12, 2025; Revised: Jan 20, 2026; Accepted: Mar 12, 2026; Published: Mar 30, 2026

Abstract: Against the backdrop of rural revitalization, inland ethnic minority regions in China are developing recreational fisheries to boost socioeconomic gains and resident well-being, with specialized formats as a core trend. To assess this industry's development and its well-being impacts, this study combined the Delphi method and Analytic Hierarchy Process (AHP) to construct an evaluation system covering eight key dimensions. Results showed economic benefits and government support were the top-priority dimensions and exerted significant positive impacts on well-being; fishery and ethnic cultural differences had moderate positive effects, with key indicators including demonstration base construction, funding subsidies, and ethnic food culture. The study concludes that optimizing policy support, innovating ethnic cultural resources, and enhancing resident skills can help achieve the dual goals of cultural conservation and improved well-being in target regions.

Keywords: Recreational fisheries, Well-being, Analytic hierarchy process, Delphi method

1. Introduction

Against the backdrop of China's rural revitalization strategy, ethnic minority areas are ushering in unprecedented opportunities for economic transformation and cultural revitalization. As an emerging industry integrating ecological conservation, cultural heritage protection, tourism recreation, and industrial innovation, leisure fisheries have been incorporated into the core goals of national fisheries development plans from the 12th to the 15th Five-Year Plans [1]. National policies explicitly mandate leveraging various water area resources to transform traditional fishing sites into ecological, scenic, and recreational spaces, while fostering diversified business formats such as sightseeing fisheries, fishing experiences, and fishery-themed cultural activities to cater to the surging demand for leisure consumption [2].

Within this policy framework, priority is given to deepening the integration of fisheries and cultural tourism, including the construction of national-level recreational fisheries demonstration bases and the exploration of new business models like fishing-themed homestays and sea fishing competitions [3]. Meanwhile, ecological conservation must be synergized with industrial upgrading: recreational fishery projects are required to adopt ecological restoration measures (e.g., stock enhancement and artificial reefs) to form a closed-loop development model of “fish observation-fish protection-fish farming” [4]. This model not only unlocks the ecological dividends of fisheries but also drives rural prosperity through “fishery-boosted tourism and tourism-driven village development”, further improving residents' living environments, increasing disposable income, and enhancing their overall wellbeing [5].

Government policies play a pivotal role in guiding planning, allocating resources, and regulating operations. Forward-looking policies such as tax incentives and infrastructure investments can reduce the burden on practitioners, improve venue accessibility, attract tourists, stimulate economic growth and employment, and thus indirectly elevate residents' wellbeing [6]. Conversely, inadequate or misaligned policies may constrain industrial development and weaken these positive impacts. Beyond policy factors, geographical constraints also hinder progress: the lagging infrastructure of recreational fisheries—especially in inland and remote mountainous ethnic minority areas with poor transportation and information isolation—impairs visitor experiences and limits local residents' ability to diversify their livelihoods [7]. Additionally, climate change has disrupted water ecosystems by altering precipitation patterns, water quality, and biodiversity, which in turn affects the distribution and abundance of fishery resources [8].

Extreme weather events and water temperature fluctuations can damage facilities, increase operational risks, destabilize industry practitioners' incomes, and ultimately erode their wellbeing [9].

Wellbeing has emerged as a core indicator for measuring the quality of individual and societal life, and has become a focal point in academic research, particularly for fostering harmonious industrial relations in ethnic minority regions. However, existing studies predominantly focus on economic impacts, ecological perceptions, and residents' participation willingness, with limited attention paid to the wellbeing of ethnic minority communities [10]. Notably, there is a lack of systematic exploration into how cultural differences, alongside government policies, geographical constraints, and climate change, jointly influence their subjective wellbeing.

To address this research gap, this paper selects three villages in Jiangkou County, Tongren City, Guizhou Province—Zhaisha Dong Village, Yunshe Tujia Village, and Zhaibao Village near Mount Fanjing—as case studies. This area was designated a National Aquatic Germplasm Resource Reserve for Endemic Fish in 2015 and boasts several top eco-fishery sites in Guizhou. In recent years, Jiangkou County has pioneered a distinctive leisure fishery model by integrating cold-water fish resources with ethnic minority culture, supported by government policies and fishery bases. The county has achieved notable progress in fishery-driven poverty alleviation, and was listed among China's Top 100 Counties for Tourism Competitiveness in 2019 [11]. While this model has improved local infrastructure and living standards, it has also faced challenges such as low participation rates among ethnic minority residents and declining environmental quality [12]. These villages thus serve as a typical microcosm of leisure fisheries development in China's ethnic minority regions, reflecting the dynamics of residents' wellbeing changes during industrialization.

This paper employs the Analytic Hierarchy Process (AHP) to study the key influencing factors and indicators of the well-being of ethnic minority residents related to cultural differences in recreational fishery. Through questionnaire survey data, the aim is to provide scientific evidence and decision-making references for governments in ethnic minority areas, in order to optimize policy guidance, improve regulatory frameworks, promote industrial transformation, construct sustainable development models, and ultimately enhance the well-being of local residents.

2. Literature Review

Amid the in-depth advancement of rural revitalization strategies and the growing academic and policy emphasis on residents' subjective well-being, recreational fisheries in ethnic minority-inhabited regions have emerged as a pivotal nexus for reconciling ecological conservation, cultural heritage preservation, and socioeconomic prosperity. This section undertakes a systematic and critical review of core concepts, foundational theoretical frameworks, industry development status quo, and comparative advantages pertaining to recreational fisheries, with a focused inquiry into the intrinsic mechanisms through which cultural diversity in recreational fisheries interacts with the well-being of local indigenous residents. Given the multidimensionality and complexity of factors governing recreational fisheries development and its subsequent impacts on residents' well-being, this literature review synthesizes extant scholarly works to delineate three core logical strands: the conceptual connotation and measurement of well-being, the theoretical underpinnings of recreational fisheries development in ethnic minority contexts, and the empirical landscape of the industry's evolution in target regions. This integrative review framework establishes a robust theoretical groundwork for identifying context-specific influencing factors, which necessitates the synergistic integration of local residents' subjective perceptions, the inherent cultural value of traditional fisheries, and the on-the-ground development realities of fisheries sectors in ethnic minority areas.

2.1 Definition of Happiness

The concept of happiness can be traced back to the time of Socrates in ancient Greece, who first proposed that the pursuit of virtue is the guarantee for people to attain happiness. Subsequently, Aristotle and Plato developed and refined Socrates' theory, with Aristotle particularly offering a comprehensive theory of happiness from a philosophical perspective through speculative reasoning [13]. He posited that the highest state of happiness is virtue; achieving virtue leads to happiness. He also argued that virtuous practices constitute happiness [14]. The concept of well-being was first introduced by Easterlin (1974), who observed an inverted U-shaped linear relationship between income and well-being. He found that as income increases, people's sense of well-being gradually rises, peaks at a certain point, and then diminishes as marginal well-being decreases [15]. Subsequently, various scholars defined well-being from different perspectives. Broadly, well-being can be categorized into subjective well-being and psychological well-being. Diener (1984) first introduced subjective well-being, defining it as an individual's cognitive evaluation and emotional experience of life [16]. Ross et al. [17] viewed well-being as a psychological state arising from the fulfillment of diverse personal needs. Veenhoven defined subjective well-being as an individual's evaluation of their overall quality of life through affects and thoughts [18]. Xing [19] characterized it as the unity of satisfaction, happiness, and sense of value—a positive psychological experience regarding one's survival and development status, arising from the interplay of objective conditions and value-based needs. From these diverse conceptualizations, it is evident that happiness manifests primarily on subjective and psychological levels. It expresses, on one hand, an individual's satisfaction with

their current life circumstances and, on the other, the degree to which they achieve their pursued goals. When an individual feels content with their life state and realizes their aspirations, personal happiness is attained.

2.2 Theories Related to Recreational Fisheries and Ethnic Minorities

As a composite industry integrating agriculture, fisheries, tourism, and culture, recreational fisheries are underpinned by multiple theoretical frameworks, including sustainable development theory, multifunctional agriculture theory, experience economy theory, and place-based theory. These theories provide an academic foundation for the development of recreational fisheries while also offering reference points for ethnic minority-specific development models.

Sustainable Development Theory emphasizes balancing economic growth with social equity and ecological conservation. As an industry reliant on natural ecosystems, recreational fisheries must adhere to sustainable development principles. This involves achieving coordinated economic, social, and ecological benefits through scientific fisheries management, eco-friendly tourism development, and cultural resource preservation. This principle holds particular significance in ethnic minority regions [20]. Many ethnic minority settlements are located in ecologically fragile areas—for instance, the Miao and Dong communities in Guizhou predominantly inhabit karst landscapes characterized by limited water resources and ecosystems vulnerable to disruption [21]. Therefore, developing recreational fisheries must balance economic benefits with ecological conservation. For instance, promoting ecological fishing models like “rice-fish co-cultivation” not only avoids damaging the natural environment but also advances local ecological protection and green sustainable development [22].

Multifunctional Agriculture Theory posits that agriculture encompasses not only the production of food and cash crops but also multiple functions including ecological regulation, social and cultural heritage preservation, and recreational activities. Recreational fisheries exemplify this expansion of agricultural and fisheries functions. By developing diversified industries such as rural tourism, recreational angling, water-based entertainment, and fisheries cultural exhibitions, the economic and social value of fisheries is enhanced [23]. In ethnic minority regions, traditional fisheries represent not only a production method but also a cultural symbol. For instance, the Dong people's rice-fish farming, the Miao people's fish sacrifices, and the Tujia people's fishing customs all reflect the multifunctionality of fisheries. Integrating these cultural elements into recreational fisheries can attract visitors to participate in experiential activities. The Dong region, for example, can develop an “ecotourism model combining rice-fish symbiosis with ethnic villages,” allowing tourists to enjoy pastoral scenery while experiencing the joy of Dong rice-field fishing [24].

The Experience Economy Theory emphasizes that the modern economy has shifted from a “product economy” to an “experience economy,” where consumers not only purchase products or services but increasingly value the feelings and experiences gained during consumption [25]. The development of recreational fisheries is grounded in this theory, enhancing visitors' immersive experiences through activities such as angling, fishing, displays of fishing culture, and folk customs. The role of the experience economy is particularly prominent in ethnic minority recreational fisheries. For instance: Miao regions can develop projects like “Single-log Dragon Boat Experience + Miao Fish Feast,” allowing visitors to participate in dragon boat races followed by tasting specialty fish dishes [26]; Dong regions can organize interactive activities such as “Rice Paddy Fishing + Ethnic Song and Dance Performances,” enabling visitors to experience Dong culture in a relaxed and joyful atmosphere [27]; Tujia regions could introduce “fishing skill training + Tujia fishing and hunting story sharing,” enabling visitors to learn fishing techniques while understanding Tujia fishing culture [28].

Place Dependence Theory emphasizes that the successful development of an industry often relies on unique local natural resources, cultural backgrounds, and social structures. The development of recreational fisheries cannot be divorced from local characteristics but should integrate unique natural environments and cultural resources to create competitive specialty products [29]. Domestic and international case studies on rural revitalization indicate that successful implementation relies on locally tailored development models. These studies suggest that different regions should develop rural industries based on their unique resource endowments, industrial foundations, and cultural characteristics; excavate the distinctive cultural essence of rural areas; promote ecological civilization construction; and enhance fishermen's sense of fulfillment and happiness [30]. The strength of ethnic minority recreational fisheries lies precisely in this locality-based approach. Different ethnic groups have developed distinctive local characteristics in fisheries production, fishing festivals, and fishing-related cultural arts. For instance, the Miao people's fish worship culture and fish totem batik form crucial cultural elements of their recreational fisheries [31]. Similarly, the Tujia people's fishing legends and fishing song traditions provide rich narrative backgrounds for developing recreational fisheries, which can be leveraged to build ethnic cultural tourism brands [32].

As an extension of agriculture and fisheries, the development of recreational fisheries is underpinned by theories of sustainable development, multifunctional agriculture, the experience economy, and place dependence. In ethnic minority regions, the growth of recreational fisheries serves not only as an economic driver but also as a vital vehicle for preserving and transmitting ethnic cultures. By integrating ethnic traditions, ecological resources, and market demands, distinctive ethnic recreational fisheries can achieve

coordinated economic, social, and ecological benefits, offering fresh perspectives for rural revitalization and sustainable development in ethnic areas.

2.3 Current Status and Outlook of Ethnic Minority Recreational Fisheries

Ethnic minority recreational fisheries are gradually emerging in China's coastal and inland regions, particularly in areas inhabited by ethnic groups such as the Miao, Dong, and Tujia. With the implementation of rural revitalization policies, recreational fisheries have progressively become a vital industry driving local economic development, promoting social employment, and preserving cultural heritage. The following outlines several current characteristics of ethnic minority recreational fisheries development:

2.3.1 Late Industry Start and Uneven Development

Although recreational fisheries developed earlier in other coastal regions of China, particularly Fujian and Zhejiang, they remain in their infancy in ethnic minority areas. In some regions, lagging infrastructure development and insufficient market-oriented operations have resulted in significant disparities in both the depth and breadth of recreational fisheries development. China's recreational fisheries sector exhibits deficiencies in overall planning, project design, development quality, and the exploitation of distinctive advantages, necessitating urgent improvements in comprehensive planning and resource integration capabilities [33]. In most regions, recreational fisheries primarily focus on leisure fishing and commercial operations, plagued by disorderly development and low-level duplication. Local aquatic resources remain underutilized, resulting in a low overall level and subpar development quality for the sector. Its distinctive features are not prominent, its industrial models are monotonous, and its operational approaches are outdated and backward. There is a significant gap between its development level and that of regional economies. This is particularly evident in the concentrated ethnic areas of the Miao, Dong, and Tujia peoples in the southwest region. Despite abundant natural resources, these areas have yet to establish competitive industrial chains or market-oriented operational models [34].

2.3.2 Limited Integration of Culture and Fisheries

The development of recreational fisheries in ethnic minority regions often remains confined to a rudimentary combination of traditional fishing practices and tourism, lacking systematic cultural packaging and immersive experiences. Minority groups exhibit limited forms of utilizing traditional cultural resources, with incomplete cultural inheritance systems and severe product homogenization issues [35]. For instance, in Miao ethnic regions, fishery culture has not fully leveraged distinctive cultural elements like fish worship rituals and fish-totem batik. Instead, mass-produced silver ornaments and clothing are commonly used [36].

2.3.3 Increasing Policy Support

In recent years, the China Leisure Fisheries Development Monitoring Report (2021) [37] indicates that China's Ministry of Agriculture and Rural Affairs issued the National Rural Industry Development Plan to promote specialized, high-quality leisure fisheries development. Through policy integration, it facilitates fishermen's transition to alternative livelihoods, optimizes regional leisure fisheries distribution, and explicitly mandates economic development and cultural preservation in ethnic minority areas. For instance, provinces like Guizhou, Yunnan, and Hunan have actively introduced supportive policies to attract foreign investment and foster local government partnerships for developing recreational fisheries projects. Additionally, local governments have provided financial backing to advance infrastructure development, including constructing fishery tourism facilities, promoting eco-friendly aquaculture techniques, and offering training programs [38].

2.4 Advantages of Developing Distinctive Recreational Fisheries

The development of recreational fisheries in ethnic minority regions holds significant advantages, enriching local tourism resources while injecting new vitality into regional economic and social development. First, unique fishing cultures and ethnic characteristics endow recreational fisheries with profound cultural significance. By integrating cultural elements such as traditional fishing methods, ethnic festivals, and folk performances into tourism experiences, ethnic minority regions can establish tourism brands that blend cultural identity with aesthetic appeal, enhancing destination attractiveness and competitiveness. Examples like the Dong Grand Song, Miao New Year Festival, and Dong New Year Festival draw large numbers of visitors seeking ethnic cultural experiences. Traditional production and living conditions themselves constitute folk tourism resources, making Qiandongnan Miao and Dong Autonomous Prefecture in Guizhou Province a hotspot for cultural tourism. These cultural elements provide rich substance for recreational fisheries. The Dong people's "rice-fish symbiosis" is not only a fishing production method but also integrates traditional Dong agriculture and water culture, attracting visitors to experience and learn. Through these cultural experiences, visitors gain deeper

insights into local history and customs[39]. Secondly, ethnic regions generally boast superior ecological environments with pristine waters and scenic landscapes, providing natural conditions for developing eco-leisure fisheries[40]. Leisure fisheries centered on ecological conservation not only achieve green development but also advance ecological civilization construction. Finally, abundant fishery resources support diversified industries, while the integrated development of activities like angling, sightseeing, experiential programs, and educational tours fosters employment and income growth.

2.5 Theories Related to Success Factors

The function of key factor indicators lies in their ability to depict the current state, highlight gaps between the present and ideal standards, and provide insights for improvement strategies [41]. These indicators not only offer understanding of the current situation but also serve as a basis for evaluating overall development potential. The principles for selecting factor indicators are crucial for ensuring their relevance, importance, validity, reliability, objectivity, timeliness, and usefulness [42]. Furthermore, indicators must be representative, theoretically grounded, stable, reliable, and credible, while prioritizing simplicity and data availability in real-world contexts. Key factor indicators should effectively reflect core issues, adhering to principles of validity, usability, stability, comprehensibility, relevance, importance, and practicality [43]. Essentially, key factor indicators encompass both quantitative data and qualitative insights reflecting reality. Their construction and application must adhere to established principles while eliminating potential confounding factors. Expert involvement from relevant fields is essential during indicator selection to ensure accuracy and validity [44]. The selection process requires meticulous attention and multifaceted consideration to guarantee the effectiveness and reliability of the evaluation process. The literature further underscores the importance of understanding factors influencing the success or failure of projects or initiatives. By identifying and leveraging key success factors, organizations can enhance their competitive advantage and improve overall performance. The systematic identification and evaluation of these factors provide a structured approach to decision-making and strategic planning. Additionally, the availability of metrics facilitates the assessment of processes and the identification of best practices. By adhering to established principles and involving experts in the selection process, organizations can strengthen their decision-making processes and drive success [45].

3. Materials and Methods

3.1 Weight Allocation in the Evaluation Indicator System

3.1.1 Model Construction

When addressing complex problems, establishing logical relationships between different levels is crucial for constructing the problem more effectively [46]. A hierarchical model typically comprises three levels: the highest level (objective layer), the intermediate level (criterion layer), and the lowest level (procedure layer). In this study, we constructed a three-level model corresponding to a quality indicator system, which includes 8 first-level indicators, 22 second-level indicators, and 51 third-level indicators. We conducted a preliminary questionnaire survey on the key success factors for the development of leisure fisheries with ethnic cultural characteristics.

3.1.2. Establishing the Expert Decision Matrix

The assignment of judgment matrices is a critical aspect of AHP, as it ensures the consistency of evaluation reasoning [47]. When these assignments lack rationality, the resulting weights may be unreliable, thereby affecting the decision-making process [48]. The study employed a 7-point Likert scale to measure the importance of each indicator [49], with experts providing value judgments that were subsequently converted into importance weights via AHP calculations [50]. To facilitate experts' determination of indicator importance across different levels, the fundamental 7-point scale—renowned for its simplicity and effectiveness—was adopted [51].

3.1.3. Implementation of the Expert-Defined Framework

Numerous methods exist for calculating quality indicator weight coefficients, including geometric mean (root mean square), arithmetic mean (sum method), eigenvector method, and least squares method [52]. In our study, we selected the geometric mean method. Consistency tests commonly employ Saaty's (1980) [53] consistency index (C.I.) and average random consistency index (R.I.). The ratio of C.I. to R.I. is termed the consistency ratio (C.R.). For $n > 2$ order matrices, a C.R. below 0.10 indicates satisfactory consistency of the judgment matrix, while a C.R. above 0.10 necessitates matrix adjustment [54]. The conceptual judgment matrix and its properties play a fundamental role in the decision-making process, particularly in the context of rank preservation and reliability allocation [55].

3.1.4. Verifying Consistency

When the order of a matrix n is large, ensuring its consistency becomes challenging due to the extensive pairwise comparisons required. To address this issue, the Consistency Index (CI) is employed to verify the consistency of the matrix under the AHP framework. The CI is defined as follows by calculating the matrix's maximum eigenvalue:

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

Where λ_{\max} is the maximum eigenvalue of the matrix and n is the order of the matrix. A smaller CI indicates better consistency; if the matrix is perfectly consistent, CI equals zero. The Random Consistency Index (R.I.) is a key component in the Analytic Hierarchy Process (AHP) for evaluating the consistency of pairwise comparison matrices. R.I. is predefined and based on the size (n) of the matrix used in the analysis. These values represent the average consistency index of randomly generated pairwise comparison matrices. Recognizing that consistency deviations may arise from random factors, CR is introduced into Equation (2) as follows:

$$CR = \frac{CI}{RI} \quad (2)$$

3.1.5. Ensuring Quality Control

The entire process of expert consultation and research was strictly conducted under the guidance of the teaching and research department's research team. During the development of the first, second, and third rounds of consultation questionnaires, the research team conducted an in-depth review of the latest literature. The Delphi method, which involves surveying experts and scholars, makes the selection of appropriate participants a critical factor affecting the accuracy of survey results. The selection of experts and scholars primarily relied on three criteria: knowledge level, reliability, and accuracy [56]. However, the lack of suitable measurement tools often complicates this process. Evaluation must instead be conducted through alternative methods, such as self-assessment by experts, peer review, intelligence sources, and assessments of responsibility, authority, and expertise [57–58]. Consequently, the selection of experts and scholars for interviews was primarily based on their professional knowledge, experience, and sense of responsibility (willingness to cooperate and support the research). To meet these criteria, research subjects were selected based on the following aspects: (1) engagement with recreational fisheries experts, (2) over ten years of teaching relevant courses, (3) ongoing interaction with domestic recreational fisheries researchers, and (4) involvement in corporate management with decision-making roles as advisory subjects. To avoid face-to-face contact, private consultations were conducted via repeated questionnaires. The concept of Key Success Factors involves evaluating specific objectives through measurable indicators [59]. These metrics are crucial for assessing the value of events or decision-making processes [60]. Key Success Factors require collecting relevant data against specific criteria to identify strengths and weaknesses of the subject under evaluation [61,62]. This process aims to enhance service quality or serve as a foundation for administrative management [63]. As emphasized by the OECD, indicators are parameters extracted from data to describe phenomena, environments, or regional conditions. They function as tools for judgment and measurement, reflecting the level of a given situation [64]. Consequently, key factor indicators are vital for evaluating and judging the value of subjects against relevant standards or parameters.

3.2 Key Factors Influencing Residents' Well-being from Ethnic Minority-Characteristic Recreational Fisheries Development

The function of key factor indicators lies in depicting the current state, highlighting gaps between reality and ideal standards, and providing insights for improvement strategies [65]. These indicators not only offer understanding of the present situation but also serve as a basis for evaluating overall development potential. The selection principles for factor indicators are crucial for ensuring their relevance, importance, validity, reliability, objectivity, timeliness, and usefulness [66]. Furthermore, indicators must be representative, theoretically grounded, stable, reliable, and credible, while prioritizing simplicity and data availability in real-world contexts. Key factor indicators should effectively reflect core issues, adhering to principles of validity, usability, stability, comprehensibility, relevance, importance, and practicality. Essentially, key factor indicators encompass both quantitative data and qualitative insights reflecting reality. The construction and utilization of these indicators must adhere to established principles while excluding potential confounding factors. During the indicator selection process, experts from relevant fields must be involved to ensure accuracy and reasonableness. The selection process requires meticulous attention and multifaceted consideration to guarantee the validity and reliability of the evaluation process. The literature also emphasizes the importance of understanding the factors influencing the success or failure of projects or initiatives. By identifying and leveraging key success factors, organizations can enhance their competitive advantage and improve overall performance. The systematic identification and evaluation of these factors provide a structured approach to decision-making and strategic planning. Furthermore, the availability of metrics facilitates the assessment process and identification of best

practices. By adhering to established principles and involving experts in the selection process, organizations can strengthen their decision-making processes and drive success .

4. Results

4.1 Consistency check

During the testing phase, preliminary review indicators were established. Following the first round, indicators were revised based on expert feedback, and the Delphi method was employed across both rounds of questionnaires. The second questionnaire presented the results of the first round alongside detailed feedback from experts and scholars. Participants were asked to review the initial findings and provide further comments. This questionnaire comprised three sections: supplementary explanations of first-round expert opinions, re-evaluation of indicators, and an open-ended section for additional expert feedback. These results provided the basis for developing the AHP questionnaire. First, indicator consistency results must remain valid until confirmed, as shown in Table 1. The results demonstrated high consistency, with a Consistency Ratio (C.R.) of 0.999, well below the 0.1 threshold, indicating reliable surface judgments.

Table 1. Overall reviewers were given C.I. and C.R. values for the AHP questionnaire.

Merits/Sub-Criteria	C.I. Value	C.R. Value	Consistency Check
Level 1	0.0064	0.0046	0.005
Level 2			
b1 Geographic Restrictions	0.0001	0.0002	Consistent
b2 Climate Change	0	0	Consistent
b3 Community Participation	0.0001	0.0002	Consistent
b4 Self-development	0	0	Consistent
b5 Cultural differences among ethnic groups	0.0002	0.0002	Consistent
b6 Economic Benefits	0	0	Consistent
b7 Differences in Fishing Cultures	0.0001	0.0002	Consistent
b8 Government support	0.0011	0.0022	Consistent
Level 3			
b1-1 Special landforms	0	0	Consistent
b1-2 Road Construction	0	0	Consistent
b1-3 Local Fishing Ban	0	0	Consistent
b1-4 Temperature and precipitation	0	0	Consistent
b1-5 Extreme weather	0	0	Consistent
b1-6 Level of resident participation	0.0016	0.0018	Consistent
b1-7 Community Mutual Aid and Support	0.0005	0.001	Consistent
b1-8 Social Relationships and Well-Being	0.0005	0.001	Consistent
b1-9 Skill Enhancement and Education	0	0	Consistent
b1-10 Entrepreneurship and Innovation Opportunities	0	0	Consistent
b1-11 Religious Beliefs	0	0	Consistent
b1-12 Food Culture	0	0	Consistent
b1-13 Festival Customs	0.0005	0.001	Consistent
b1-14 Cross-cultural exchange	0	0	Consistent
b1-15 Fishing income	0	0	Consistent
b1-16 Job Opportunities	0	0	Consistent
b1-17 Fishing Gear and Methods	0	0	Consistent
b1-18 Fisheries Customs	0	0	Consistent
b1-19 Fisheries Knowledge Transfer	0	0	Consistent
b1-20 Fishing Methods and Regulations	0	0	Consistent
b1-21 Financial subsidy	0	0	Consistent
b1-22 Technical Support	0	0	Consistent
Overall Level Consistency Index (CIH)	0.01125		Consistent
Overall Level Random Index (RIH)	7.87		Consistent

Overall Level Consistency Ratio
CRH = (CIH/RIH)

0.00143

Consistent

4.2 Analysis of Weight of Influencing Factors

This study further conducted a weight analysis of the overall influencing factors using the AHP method (see Table 2). Among primary factors, respondents prioritized economic benefits (0.273), followed by government support (0.222). Self-development (0.123) and fishery cultural differences (0.107) ranked third and fourth, indicating that respondents generally view income and policy support as core determinants of their participation in recreational fisheries and overall well-being. Other factors such as ethnic cultural differences (0.090), community participation (0.078), geographical constraints (0.060), and climate change (0.037) received relatively lower weights, indicating their limited influence in the overall assessment, though they still hold some reference value.

At the secondary indicator level, the top five factors are: extreme weather (0.641), fishery income (0.586), entrepreneurial and innovation opportunities (0.529), financial subsidies (0.476), and skill enhancement and education (0.471). Among these, “extreme weather” underscores the critical importance of environmental stability in the well-being of fishery practitioners, while “fishery income” reaffirms the central role of economic factors. The subsequent factors—“entrepreneurship and innovation opportunities,” “financial subsidies,” and “education enhancement”—reflect respondents' strong emphasis on personal capacity development and external support, revealing the practical need for policies and individual growth to complement each other.

Further analysis reveals that among the tertiary influencing factors, “Government establishment of demonstration bases and provision of aquaculture technical support” was identified as a key success factor in the development of recreational fisheries in ethnic minority regions, with a weight of 0.667—significantly higher than other factors. Subsequently ranked were: “The village receiving government subsidy funds” and “Adherence to ethnic religious taboos or traditional customs” (both 0.641), followed by “Impact of extreme weather on livelihoods” (0.614), “Adverse effects of temperature changes on fishery resources” (0.614), “ethnic culinary culture enhancing fishery appeal” (0.586), “recreational fisheries providing stable income” (0.586), “community preservation of traditional festival customs” (0.558), “residents possessing innovative awareness for fishery development” (0.558), and “residents recognizing the positive role of fishing moratorium policies” (0.558). These ten key factors encompass policy support, climate environment, cultural identity, and economic dimensions, highlighting the pivotal role of the tripartite mechanism—“government support + cultural integration + ecological safeguards”—in enhancing ethnic minorities' well-being and advancing the sustainable development of recreational fisheries.

These key factors, within the context of rural revitalization policies, form the cornerstone for developing distinctive recreational fisheries in ethnic minority regions. They not only strengthen material livelihood security but also emphasize spiritual and cultural identity and belonging, holding practical significance for achieving the rural revitalization goals of “thriving industries, ecologically pleasant living environments, and flourishing culture.”

Table 2. Priority and ranking of expert opinion calculated using the AHP method.

Level 1	Weight	Level 2	Weight	Weight relative to upper level	Rank	Level 3	Weight	Overall weight	Rank
Geographic Restrictions	0.060	Special landforms	0.376	0.022	17	Sub-Criteria	0.529	0.012	25
		Road Construction	0.229	0.014	20	Environment limitation special conditions	0.471	0.011	28
		Local Fishing Ban	0.395	0.024	16	income and quality improve	0.471	0.006	46
		Temperature and precipitation	0.359	0.013	21	prove fishery develop	0.529	0.007	41
		Extreme weather	0.641	0.024	15	the policy influences income	0.442	0.010	29
Climate Change	0.037	Temperature and precipitation	0.359	0.013	21	the policy benefit in fishery development	0.558	0.013	24
		Extreme weather	0.641	0.024	15	climate change	0.614	0.008	36
		0.078	0.333	0.026	11	rainfall change	0.386	0.005	47
						extra -weather bad influence	0.386	0.009	34
						frequency of occurrence	0.294	0.008	37

Community Participation	Level of resident participation	0.317	0.025	13	well-connected with government departments	0.259	0.007	44
					participate in fishery decision-making opinion adopted	0.198	0.005	48
					resident supervision	0.249	0.006	45
					community mutual aid cooperative	0.297	0.007	40
					community activities	0.421	0.010	30
					Environment protection and sustainable development	0.282	0.007	42
					good relationship with community members enhanced well-being	0.383	0.009	32
						0.347	0.009	31
						0.270	0.007	39
					Self development	0.123	0.471	0.058
fishery knowledge and professional skills	0.436	0.025	12					
personal sense of accomplishment	0.324	0.019	17					
participate in entrepreneurial activities	0.442	0.029	10					
innovative ideas in fishery	0.529	0.065	4					
Cultural differences among ethnic groups	0.090	0.287	0.026	12	religious beliefs influence professional practices	0.359	0.009	33
					religious taboos	0.641	0.017	19
					impact of dietary habits on resource utilization	0.414	0.007	38
					unique food attracts tourists	0.586	0.011	27
					traditional festival improve economic development	0.282	0.009	35
					festival activities increase well-being national cultural pride	0.421	0.013	23
					cross-ethnic fishery cultural exchange promotes development	0.297	0.004	50
					foreign culture weakens traditional culture protect and inherit traditional culture can improve cohesion	0.335	0.005	49
						0.214	0.003	51
						0.451	0.007	43
Economic Benefits	0.273	0.586	0.160	1	provide a steady income	0.586	0.094	1
					increase income channels	0.414	0.066	3
					enhanced job opportunities	0.471	0.053	5
					promote other industrial development	0.414	0.113	2
Differences in Fishing Cultures	0.107	0.227	0.024	14	traditional fishing methods still important retention and innovation of fishing gear and methods	0.442	0.011	26
						0.558	0.014	22
					traditional activities enhance engagement customs transmission and exchange foster cultural exchange	0.471	0.022	14
					inherit fishing skill	0.529	0.025	13
					promote and popularize the culture of fishing	0.529	0.019	16
Government support	0.222	0.262	0.058	5	the importance of fishing law	0.339	0.036	8
					fishery knowledge transfer	0.471	0.017	18
					fishery methods	0.558	0.032	9
	0.442	0.026	11					

and Regulations								
Financial subsidy	0.476	0.106	3	government subsidy funds	0.641	0.068	2	
Technical Support	0.262	0.058	5	tax reduction or exemption	0.359	0.038	7	
				demonstration base establishment	0.667	0.039	6	
				fishery product preservation techniques	0.333	0.019	15	

4.3 The key indicator system that affects residents' sense of happiness

Once the weights for each indicator are obtained, the indicator system is complete. The results are shown in Table 3, where economic benefit conditions emerge as the most critical factor with the highest weight of 0.273. This is followed by government support (0.222) and self-development (0.123). Differences in fishery culture (0.107) and ethnic culture (0.090) rank fourth and fifth, respectively. Community participation (0.078) and geographical constraints (0.059) ranked sixth and seventh, respectively. Climate change conditions were deemed the least significant factor, with a weight of 0.037.

Table 3. The key success factors and recommended indicators of recreational fishery development under the rural revitalization policy.

Merits/Evaluation Scope(%)	Criteria/Evaluation Item(%)	Sub-Criteria
geographical restriction (6%)	special landforms (38%)	Environmental limitation special conditions
	road construction (23%)	income and quality improve prove fishery develop
	local fish ban (40%)	the policy influences income The policy benefit in fishery development
climate change (4%)	temperatures and rainfall (36%)	climate change rainfall change
	extra-weather (64%)	extra -weather bad influence frequency of occurrence
community engagement (8%)	resident involvement (33%)	well-connected with government departments participate in fishery decision-making opinion adopted resident supervision
	community mutual assistance and support (32%)	community mutual aid cooperative community activities
	social relationships and well-being (35%)	Environmental protection and sustainable development good relationship with community members enhanced well-being
self-development (12%)	skill improvement and education (47%)	more opportunities fishery knowledge and professional skills
	Entrepreneurship and innovation opportunities (53%)	personal sense of accomplishment participate in entrepreneurial activities innovative ideas in fishery
Ethnic cultural differences (9%)	religion faith (29%)	religious beliefs influence professional practices religious taboos
	food cultural (20%)	impact of dietary habits on resource utilization unique food attracts tourists
	Festive customs (35%)	traditional festival improve economic development festival activities increase well-being national cultural pride

	cross-cultural communication (17%)	cross-ethnic fishery cultural exchange promotes development foreign culture weakens traditional culture\ protect and inherit traditional culture can improve cohesion
economic gains (27%)	fishery income (59%) employment opportunities (41%)	provide a steady income increase income channels enhanced job opportunities promote other industrial development
fishery cultural differences (11%)	fishing gear and fishing methods (23%) fishing customs (43%) fishery knowledge delivery (34%)	traditional fishing methods still important retention and innovation of fishing gear and methods traditional activities enhance engagement customs transmission and exchange foster cultural exchange inherit fishing skill promote and popularize the culture of fishing
government support (22%)	fishing law (26%) funding subsidy (48%) technical support (26%)	the importance of fishing law fishing law ensure the safety of fishing activities government subsidy funds tax reduction or exemption demonstration base establishment fishery product preservation techniques

Meanwhile, fishery cultural differences (0.107) and ethnic cultural differences (0.090) ranked fourth and fifth, highlighting the significance of cultural diversity in shaping unique tourism experiences. Community involvement (0.078), though slightly lower in weight, holds positive significance in enhancing local identity and preserving fishery resources. Geographic constraints (0.059) demonstrate the practical impact of geographical conditions on project implementation, while climate change conditions carry the lowest weight (0.037), indicating that current expert respondents perceive its direct influence on recreational fishery development as relatively minor in the short term.

Using the Delphi method and Analytic Hierarchy Process (AHP), this study constructed and validated an evaluation index system for assessing how cultural differences in recreational fisheries influence the well-being of ethnic minority residents. Tables 2 and 3 detail the weights assigned to each level of indicators derived from the AHP analysis.

The analysis reveals that economic benefits (weight 0.273) and government support (weight 0.222) are the two most critical dimensions driving residents' well-being, underscoring the fundamental role of material foundations and policy safeguards in industrial development within ethnic regions. Following closely, self-development capacity (0.123) and fishery cultural distinctiveness (0.107) highlight the importance of residents' endogenous motivation and the specialized transformation of cultural resources.

5. Discussion

In the context of the continuous deepening of the national rural revitalization strategy, leisure fishing is regarded as an important industrial path for achieving diverse development goals in ethnic regions, promoting cultural identity and achieving a win-win situation in economic benefits. Especially in regions with a concentration of ethnic minorities such as Guizhou, how to effectively integrate cultural diversity with industrial development has become an important issue for achieving sustainable community development and enhancing residents' sense of happiness .

This study adopts a combination of literature review, Delphi method and Analytic Hierarchy Process (AHP) to construct an evaluation index system for the impact of cultural differences in leisure fishing on the happiness of ethnic residents. In the eight evaluation dimensions at the first level, the expert assessment results show that economic benefits (weight = 0.273) are the most prioritized factor, followed by government support (0.222), self-development ability (0.123), cultural differences in fishing (0.107), cultural differences of ethnic groups (0.090), community participation (0.078), regional restrictions (0.059), and climate change (0.037). This result indicates that cultural cognition and policy systems are increasingly playing a role in the formation of the

happiness of ethnic minorities, especially in promoting the implementation of ethnic minority leisure fishing projects, the support of local governments and the rational utilization of cultural resources have become key supports.

In the sub-indicators at the second level, "leisure fishing driving local economic growth", "whether the government provides financial subsidies and technical training", "the cultural display value of traditional fishing tools and fishing methods, and festival customs" as well as "the skills improvement and entrepreneurial opportunities of community residents" are considered as the core elements for enhancing the happiness of ethnic minorities. These factors fully reflect the cross-action of economic development, cultural inheritance and community capacity building, and are the important foundation for driving the sustainable development of leisure fishing in ethnic regions.

The research results emphasize that enhancing happiness not only depends on external economic investment and infrastructure construction, but also requires stimulating the internal driving force and cultural confidence of the community. Cultural differences, as an important foundation for building the attractiveness of leisure fishing, have great potential in shaping personalized tourism experiences, enhancing ethnic identity, and extending the cultural industry chain. Although regional restrictions and climate factors have a relatively low weight in this study, their impact on resource carrying capacity and operational safety in the medium and long term cannot be ignored.

The AHP analysis provides a clear hierarchical structure, clarifying the importance ranking of each factor for the subjective happiness of ethnic residents. Assigning higher weights to cultural resources and community capabilities indicates that these two factors play an irreplaceable role in building the integrated development path of "industry - culture - people". Compared to this, although climate change and regional restrictions currently have a relatively small impact, their influence on resource carrying capacity and operational safety in the medium and long term should not be ignored and should be included in the medium and long-term planning for response.

In promoting the sustainable development of leisure fishing in ethnic minority areas, scientifically identifying key influencing factors and verifying their action paths has important practical value.

However, current development still faces many challenges: the imbalance between ecological protection and development intensity leads to increased environmental pressure; product homogeneity is serious, and the transformation of ethnic cultural characteristics is insufficient; the imperfect community participation mechanism affects the residents' sense of gain; the policy dependence in some areas restricts the cultivation of industry's internal driving force.

Based on the research findings, it is recommended to promote sustainable development from the following aspects: establish an ecological early warning mechanism and incorporate environmental assessment as a prerequisite for project implementation; deepen the innovative transformation of cultural resources, highlighting ethnic characteristics; improve the community participation and benefit-sharing mechanism; promote the application of digital technology to enhance operational efficiency; cultivate local business entities to enhance industry resilience. Future research should focus on the adaptability issues of recreational fisheries under different regional conditions, explore the integration path of traditional culture and modern management, and provide more targeted solutions for the industrial revitalization of ethnic regions. It is suggested to establish a promotion group for the development of recreational fisheries led by the local government and involving multiple departments, to ensure the effective implementation of key measures.

6. Conclusions

Based on the evaluation system for the impact of leisure fishing cultural differences on the happiness of ethnic minority residents constructed in this study, the overall indicators cover 8 main dimensions, 22 secondary indicators, and 51 tertiary indicators. Based on this, key implementation strategies were proposed.

The study found that the most important dimension for promoting the development of leisure fishing is economic benefits, followed by government support, and the third is self-development ability. The 4 key indicators that experts and scholars are most concerned about include: "6-1". "Leisure fishing brings stable income"; "8-4". "The government provides financial subsidies"; "4-1". "Skill improvement and education"; and "4-2". "Entrepreneurship and innovation opportunities". Based on the results of AHP weight analysis and SEM path verification, the following three suggestions are proposed: (1) Incorporate leisure fishing into the core content of the rural revitalization strategy in ethnic areas, and focus on strengthening the dual drive of economic benefits and policy support; (2) Based on the indicator system constructed in this study, formulate differentiated regional development policies, and pay special attention to the transformation path of cultural differences to economic benefits; (3) Establish a "leisure fishing development promotion group" led by the local government, integrating multiple departments such as culture, tourism, and fishing, to ensure the effective implementation of key success factors and resource coordination.

Author Contributions: Conceptualization, Ta-Jen Chu, Chun-Han Shih, and Zhi-Hong Yang; methodology, Chun-Han Shih, Zhi-Hong Yang; software, Zhi-Hong Yang; validation, Chun-Han Shih, Zhi-Hong Yang; formal analysis, Zhi-Hong Yang; investigation, Ta-Jen Chu; resources, Zhi-Hong Yang; data curation, Zhi-Hong Yang; writing—original draft preparation, Zhi-Hong Yang; writing—review and editing, Ta-Jen Chu, Zhi-Hong Yang; visualization, Zhi-Hong Yang; supervision, Ta-Jen Chu and Zhi-Hong Yang.

Funding: This research was funded by Jimei University, Grant No. C619061. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Acknowledgments: We thank Kuo, Huang, and Shi for their contributions to the suggested revisions of the manuscript. Helpful suggestions from anonymous reviewers have been incorporated into the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Lu, K.; Liu, T.; Wang, Q.Y.; et al. Evaluation and prospect analysis of leisure fisheries development in China. *Chin. Mar. Econ.* **2021**, *2*, 1–20.
2. Yang, Z.J.; Peng, Y.W.; Xiao, L.X.; et al. Central No.1 Document: New directions for fishery development. *China Fish.* **2025**, in press.
3. Zhang, C.H.; Chen, J.Z.; Chen, Z.J. Problems and countermeasures of leisure fisheries development under the background of rural revitalization strategy: A case study of Fuding City, Fujian Province. *Agricultural Industrialization* **2025**, *3*, 26–28.
4. Zhu, X. Ecological wisdom and contemporary value of ethnic minorities in Southwest China: A review of Study on Ecological Culture of Ethnic Minorities in Guizhou. *Journal of the Chinese Society of Education* **2024**, *12*, 140.
5. Li, Y.Q.; Ai, S.S. Research on the development of ethnic cultural tourism in Southeast Guizhou. *Guangxi Qual. Superv. Guide Period.* **2019**, *5*, 148–149.
6. Huang, Y.P.; Liu, D. Research on the path of tourism industrialization and sustainable development in ethnic areas of Guizhou. *China Collect. Econ.* **2025**, *12*, 49–52.
7. Zhu, J.X. Development strategies of leisure fisheries under the background of rural revitalization. *Agric. Ind.* **2024**, in press.
8. Wang, K. Research on water resources management strategies in ecological environment protection. *China Resour. Compr. Util.* **2024**, in press.
9. Liu, Y.J.; Zhang, S.B.; Sun, S.; et al. Impact of climate change on offshore fisheries and countermeasures. *China Fish.* **2024**, *12*, 46–47.
10. Zhao, M.H.; Qi, Y.Y. Sense of happiness and fairness of ethnic minority groups in China: Effects of economic growth and people's livelihood development. *J. Cent. Inst. Social.* **2024**, in press.
11. Yang, J. Current situation and countermeasures of fishery development in Qiandongnan Prefecture. *Sci. Fish Farming* **2025**, in press.
12. Wang, W.B. Analysis on the existing problems and practical paths of high-quality fishery development. *Fish. Guide Prosper.* **2020**, *18*, 14–18.
13. Chen, W.Z. An analysis of the elements of the view of happiness in the new era from the perspective of Chinese and Western traditional views of happiness. *J. West. Stud.* **2024**, in press.
14. Aristotle. *Nicomachean Ethics*; Liao, S., Trans.; The Commercial Press: Beijing, China, **2003**.
15. Grimes, A.; Reinhardt, M. Relative Income and Subjective Wellbeing: Intra-National and Inter-National Comparisons by Settlement and Country Type. SSRN **2015**. <https://doi.org/10.2139/ssrn.2660550>
16. Diener E. Subjective well-being. *Psychol. Bull.* **1984**, *95*(3), 542–575.
17. Ross, M.; Eyman, A.; Kishchuk, N. Determinants of subjective well-being. In *Relative Deprivation and Social Comparison*; Olson, J.M., Herman, C.P., Zanna, M.P., Eds.; Lawrence Erlbaum: Hillsdale, NJ, USA, **1986**; pp. 79–93.
18. Veenhoven, R. *How Do We Assess How Happy We Are? Tenets, Implications and Tenability of Three Theories*; Edward Elgar Publishing: Cheltenham, UK, **2009**; pp. 45–69.
19. Xing, Z.J. A study on the relationship between residents' income and happiness in China. *Sociol. Stud.* **2011**, *25*, 196–219.
20. Luo, M.N.; Liu, X.B. The "win-win" path between economic development and ecological protection in nature reserves: An analysis of Research Methods and Practice on the Coordinated Development of Economic Construction and Ecological Protection in Nature Reserves. *Environ. Prot.* **2024**, *52*, 74–75.
21. Jiang, H. Comprehensive management practice of rain-fed river basins in karst areas. *Water Saf.* **2023**, *16*, 88–90.
22. Wang, Z.P.; Sun, H.L.; Xu, L.; et al. Analysis on the eco-environmental benefits of the integrated rice-fishery cultivation model. *Mod. Agric. Sci. Technol.* **2025**, *6*, 101–106.
23. Zhao, M.J.; Cui, Q.J.; Zhou, C.H. Theory and path of agricultural high-quality development promoted by the realization of agricultural multi-functional value. *Rural Econ.* **2025**, *3*, 20–29.
24. Zhao, J. A study on the Dong people's fish culture from the perspective of food anthropology. *J. West. Stud.* **2025**, *7*, 21–24.

25. Shen, J.J. Research on the integrated development of traditional sports culture of ethnic minorities in Guizhou and local cultural tourism under the background of "Three Exchanges". *China Foreign Cult. Exch.* **2025**, *3*, 194–196.
26. Dong, Y.B.; Deng, H. Exploration on the path of folk dance in ethnic minority areas empowering rural revitalization. *Shang Wu* **2025**, *6*, 97–99.
27. Zhao, L.; Liu, H.M.; Yang, Z.J. A preliminary study on the development of leisure fisheries from the perspective of fishery culture. *J. Ocean Univ. China Soc. Sci. Ed.* **2014**, *1*, 45–49.
28. Wei, C. A brief discussion on the development of leisure agriculture and rural tourism. *Guangdong Seric.* **2020**, *12*, 127–128.
29. Chen, C. Study on the symbiotic development of China's fishery industry and its influencing factors. Master's Thesis, Huazhong Agricultural University, Wuhan, China, **2023**.
30. Wang, K.; Chen, Y.; Xie, K.F. The integration of four chains in the implementation of rural revitalization strategy: From the perspective of complex scientific management. *J. Inf. Manag. Res.* **2020**, *5*, 48–58.
31. Luo, S.H. A brief analysis of the aesthetic characteristics of fish patterns in the batik costumes of the Miao people in Qiandongnan. *West Leather* **2024**, *46*, 135–137.
32. Lei, Y. A cultural perspective of Tujia proverbs. *J. Hebei Inst. Technol. Soc. Sci. Ed.* **2005**, *3*, 181–189.
33. Que, Y.Q.; He, B.; Liang, Z.Q.; et al. Current situation and suggestions for the high-quality development of ecological fisheries in Tongren City. *Sci. Fish Farming* **2025**, *1*, 10–12.
34. Lin, J. Research on the problems and countermeasures of China's leisure fisheries development under the background of rural revitalization. *South China Agric.* **2021**, *15*, 148–150.
35. Xia, Y.M.; Ma, Y.Q. Research on the protection and development of traditional villages based on local knowledge: A case study of Xijiang Qianhu Miao Village. *Archit. Cult.* **2025**, *6*, 233–236.
36. He, Q.Q. The role of traditional cultural resources in rural revitalization in ethnic minority areas. *Agric. Econ.* **2021**, *5*, 36–37.
37. Editorial Board. Monitoring report on the development of leisure fisheries in China. *China Fish.* **2021**, *10*, 35–41.
38. Reporter. Using "fish" as a medium to set off a cultural tourism upsurge. *China Food News* **2025**.
39. An, Q.J. Qiandongnan Prefecture: A preliminary study on the coordinated tourism development model of ethnic cultural resources. *Glob. Hum. Geogr.* **2025**, *12*, 137–139.
40. Liu, X.C. Discussion on the development of ethnic tourism and tourism industry in ethnic areas. *Heilongjiang National Series* **2016**, *4*, 76–80.
41. Zhang, R.H. A new model of high-quality development of fishing villages led by marine ranches under the background of rural revitalization: A case study of Qingyutan Village, Rongcheng City, Shandong Province. *Sichuan Agric. Sci. Technol.* **2024**, *12*, 92–95.
42. Miller, S. Implementing Strategic Decisions: Four Key Success Factors. *Organ. Stud.* **1997**, *18*, 577–602.
43. Cvelbar, L.K.; Dwyer, L. An Importance–Performance Analysis of Sustainability Factors for Long-Term Strategy Planning in Slovenian Hotels. *J. Sustain. Tour.* **2013**, *21*, 487–504.
44. Hoffmann, W.H.; Schlosser, R. Success Factors of Strategic Alliances in Small and Medium-Sized Enterprises—An Empirical Survey. *Long Range Plan.* **2001**, *34*, 357–381.
45. Jalaliyoon, N.; Abu Bakar, N.; Taherdoost, H. Accomplishment of critical success factor in organization; using Analytic Hierarchy Process. *Int. J. Acad. Res. Manag.* **2012**, *1*, 9.
46. Nutt, P.C. Context, Tactics, and the Examination of Alternatives During Strategic Decision Making. *Eur. J. Oper. Res.* **2000**, *124*, 159–186.
47. Kikuchi, H.; Takagi, N. Hierarchical Fuzzy Modeling and Jointly Expandable Functions. *Int. J. Intell. Syst.* **2002**, *17*, 515.
48. Arlinghaus, R.; Abbott, J.K.; Fenichel, E.P.; Carpenter, S.R.; Hunt, L.M.; Alós, J.; Manfredo, M.J. Governing the Recreational. **2001**.
49. Saaty, T.L. Decision Making with the Analytic Hierarchy Process. *Int. J. Serv. Sci.* **2008**, *1*, 83–98.
50. Gao, P.P.; Li, Y.P.; Sun, J.; Li, H.W. Coupling Fuzzy multiple attribute decision-making with Analytic Hierarchy Process to evaluate urban ecological security: A Case Study of Guangzhou, China. *Ecol. Complex.* **2018**, *34*, 23–34.
51. Leung, P.; Muraoka, J.; Nakamoto, S.T.; Pooley, S. Evaluating fisheries management options in Hawaii using Analytic Hierarchy Process (AHP). *Fish. Res.* **1998**, *36*, 171–183.
52. Lawson, J.; Lee, H.; Lim, Y. Weighted Geometric Means. *Forum Math.* **2012**, *24*, 1067–1090.
53. Khorramshahgol, R.; Moustakis, V.S. Delphic Hierarchy Process (DHP): A Methodology for Priority Setting Derived from the Delphi Method and Analytical Hierarchy Process. *Eur. J. Oper. Res.* **1988**, *37*, 347–354.
54. Alonso, J.A.; Lamata, M.T. Consistency in the Analytic Hierarchy Process: A New Approach. *Int. J. Uncertain. Fuzziness Knowl.-Based Syst.* **2006**, *14*, 445–459.
55. Saaty, T.L. *The Analytic Hierarchy Process: Planning, Priority Setting; Resource Allocation*; McGraw-Hill: New York, NY, USA, **1980**.
56. Hou, F. Rank Preserved Aggregation Rules and Application to Reliability Allocation. *Commun. Stat.-Theory Methods* **2012**, *41*, 3831–3845.
57. Hsu, C.C.; Sandford, B.A. The Delphi Technique: Making Sense of Consensus. *Pract. Assess. Res. Eval.* **2007**, *12*, 8.

58. Yang, X.; Jiang, L.P. Application of the Delphi method in textbook research: Key points, strategies and cases. *J. Tianjin Norm. Univ. Soc. Sci. Ed.* **2025**, *5*, 44–55.
59. Okoli, C.; Pawlowski, S.D. The Delphi Method as a Research Tool: An Example, Design Considerations and Applications. *Inf. Manag.* **2004**, *42*, 15–29.
60. Estrin, S.; Nielsen, B.B.; Nielsen, S. Emerging Market Multinational Companies and Internationalization: The Role of Home Country Urbanization. *J. Int. Manag.* **2017**, *23*, 326–339.
61. Hensey, M. Essential success factors for strategic planning. *J. Manag. Eng.* **1991**, *7*, 167–177.
62. Luna-Reyes, L.F.; Mellouli, S.; Bertot, J.C. Key factors and processes for digital government success. *Inf. Polity* **2013**, *18*, 101–105. <https://doi.org/10.3233/IP-130307>
63. Peprný, A.; Kubícková, L.; Rovný, P. Method of evaluating the success of the small and medium-sized enterprises. *Acta Univ. Agric. Silvic. Mendelianae Brun.* **2011**, *59*, 221–230. <https://doi.org/10.11118/actaun201159020221>
64. Jenster, P.V. Using critical success factors in planning. *Long Range Plan.* **1987**, *20*, 102–109. [https://doi.org/10.1016/0024-6301\(87\)90160-9](https://doi.org/10.1016/0024-6301(87)90160-9)
65. Tu, J.C.; Tu, Y.W.; Jhangr, Y.S. Analyzing key success factors of green brands for enterprises in Taiwan. *Eurasia J. Math. Sci. Technol. Educ.* **2016**, *12*, 1327–1346. <https://doi.org/10.12973/eurasia.2016.1516a>
66. Kotas, M. Key success factors for social services organizations in Poland. *Manag.* **2015**, *19*, 122–135. <https://doi.org/10.1515/manment-2015-0018>

Publisher’s Note: IIKII remains neutral with regard to claims in published maps and institutional affiliations.



© 2026 The Author(s). Published with license by IIKII, Singapore. This is an Open Access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/) (CC BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.