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Deciphering Hot Spring Districts Development in Taiwan: Exploring Key Factors

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Abstract

Taiwan's abundant geothermal resources and extensive hot springs have cemented its reputation as a top destination for enthusiasts. Since 1999, the Taiwan Tourism Bureau has fervently promoted the nation's hot spring assets, aiming to cultivate immersive travel experiences. This study employed a comprehensive approach, integrating Focus Group Interviews, the Delphi method, and the Analytical Hierarchy Process (AHP) to explore expert perspectives on the driving forces behind hot spring district development in Taiwan. Research, from Focus Group Interviews in Tainan to Delphi method outcomes, enabled a structured evaluation of key factors across various hot spring districts nationwide. The AHP results revealed the relative weights and rankings of dimensions, highlighting "Environmental Attributes" as the most critical. Six key factors essential for promoting hot spring districts emerged: "Excellent Quality of Hot Spring Water," "Beautiful Landscape," "Good Sanitary Environment," "Rich Eco-resources," "Well-planned Hot Spring Wellness Services," and "Relaxing Natural Environment." By integrating research findings from Focus Group Interviews, the Delphi method, and the AHP, this study effectively aligned development efforts with sustainable objectives, aiding evidence-based policy formulation. The findings underscored the importance of prioritizing key factors and implementing sustainable practices, contributing to Taiwan's tourism landscape enrichment.

Keywords: Analytical Hierarchy Process; Delphi Method; Focus Group Interviews; Hot Spring Districts; Wellness Tourism

Abbreviations: LOHAS: Lifestyle of Health and Sustainability; AHP: Analytic Hierarchy Process; OIR: Overall Inconsistency Ratio; CI: Consistency Index; DW: Dimensions Weight; R: Rankings

Introduction

Health, encompassing physical, psychological, and social well-being, is recognized across contemporary domains [1,2]. In the Asia Pacific Region, health tourism is gaining popularity [3], driven by historical, cultural, and therapeutic appeal, especially evident in hot springs [1]. Post-COVID-19, hot springs have become increasingly sought after by tourists seeking personal wellness and harmony with nature [4]. While locals cherish hot springs for relaxation and reconnecting with nature, visitors often stay briefly due to work commitments, indicating a gap in recognizing their therapeutic benefits amidst busy schedules.

Nestled at the convergence of the Eurasian and Philippine Sea plates, Taiwan boasts abundant geothermal resources and extensive hot springs [5-7]. Despite the allure of Taiwan's hot spring districts, a recent study explored the experiences of Taiwanese high-tech and banking professionals, highlighting issues of occupational stress [8]. These individuals struggle to prioritize stress relief or plan leisurely trips due to demanding work schedules, often visiting hot spring districts for fleeting respites rather than dedicated wellness retreats. Recognizing the health impacts of work-related stress, implementing Lifestyle of Health and Sustainability (LOHAS) programs in Taiwan's hot spring locales, including hiking and hydrotherapy, can positively impact meridian energy levels, offering rejuvenation [9]. Alternatively, for those unable to engage in health tourism, recent proposals advocate for footbath models to manage occupational stress at home [10,11]. Nonetheless, while these alternatives contribute to health maintenance and stress alleviation, they cannot fully replicate the comprehensive benefits of immersive hot spring experiences [2].

Recognizing this trend, the Taiwan Tourism Bureau has actively promoted in-depth hot spring travel since 1999, aiming to integrate hot spring tourism with health treatment activities. Additionally, in 2003, Taiwan implemented the Hot Springs Act, igniting rapid growth in hot spring districts, making them a pivotal investment sector in Taiwanese tourism. However, most of Taiwan's hot springs originate from high mountain districts [12], presenting challenges for their transformation into hot spring districts. As of April 2024, Taiwan's official statistics reveal the presence of 25 approved hot spring districts, encompassing 434 legally designated hot spring operators across various types of accommodations, including resorts, hotels, and villas [13]. Notably, Tainan city stands out with 2 hot spring districts and a total of 36 hot spring operators. This has prompted academic research to focus on this subject, but unfortunately, most of these studies merely symbolize tourists' willingness to revisit without engaging policymakers, overlooking the intrinsic value of hot springs.

Lin suggests that Taiwan's hot springs are evolving into distinct travel destinations, emphasizing the necessity of shaping uniqueness [14]. However, branding tourist destinations typically involves a wide array of stakeholders, including local residents, tourists, and industry operators [15]. Zenker & Petersen argue that local residents often develop strong attachments to places [16], and the visibility of places can enhance tourists' attachment [17]. Achieving a delicately balanced social consensus that accommodates the commercial interests of local tourism operators while preserving the community's sense of place is a challenge [18-20], especially when considering the sustainable development vision of the hot spring districts brand. Lee emphasizes three indicators influencing the attractiveness of hot spring destinations: core attractions, infrastructure, and safety standards [21,22].

Lee & King stress that resources, strategies, and environmental goals directly impact the competitiveness of Taiwan's hot spring districts. They emphasize prioritizing safety measures, especially in hot spring bathing environments. Despite this, indicators for hot spring destination branding and policy concerns have been largely neglected. Challenges persist in Taiwan's hot spring districts, especially as tourist numbers increase and industry standardization becomes more apparent. Ensuring sustainable utilization of hot spring resources and fostering distinct regional branding pose significant policy challenges for Taiwan [22].

In summary, the research emphasizes Taiwan's focus on health and quality of life [14,23], highlighting the need for the government and tourism industry to identify key factors in developing Taiwan's hot spring districts into wellness destinations. Using the Analytic Hierarchy Process (AHP) to gather expert insights on hot spring district development can offer valuable post-COVID-19 insights into wellness tourism.

Methodology

Focus Group Interviews

In essence, the primary aim of employing Focus Group Interviews in this study is threefold: to probe themes with insufficient information, elicit stakeholders' perspectives on the development of the hot spring districts, and mitigate potential biases arising from researchers' experiential judgment and strategic considerations, thereby ensuring alignment with key policy strategy aspects. After reviewing related literature [3-5,21,22,24-27] and conducting several discussions among researchers, four issues and 39 criteria were proposed. Among these, three issues—Environmental Attribute, Supporting Facilities, and Health Facilities_were deemed relevant to the development of wellness tourism by Dunn and were thus incorporated into this study [28]. The fourth issue, Marketing and Promotion, was added due to the significant role of marketing activities in raising awareness among target customers.

The Focus Group Interview method engages 6 to 12 participants simultaneously in open and interactive discussions, allowing for a comprehensive exploration of research topics within a condensed timeframe. Renowned for its capacity to yield authentic and in-depth insights, this method is particularly well-suited for exploratory research [29-31]. At the heart of these discussions are the fundamental issues identified in the literature review as pivotal to the development of hot spring districts. These discussions take place in the Tainan government meeting room, moderated by representatives from Tainan's tourism department.

Participants in these discussions represent key stakeholders in Tainan's hot spring district policy, including government officials, scholars, members of local associations, and operators of hot spring resorts. Their selection follows a purposive sampling method aimed at ensuring diverse perspectives. Through face-to-face interactions, participants engage deeply with the topics, fostering commitment to decision-making on strategy factors and minimizing biases.

Throughout the sessions, meticulous real-time documentation captures the essence of the discussions, providing a solid foundation for subsequent analysis. Experts then scrutinize the feedback received, refining the identified indicators. Finally, the moderator synthesizes the consensus reached in the focus group discussions into 25 decision-making indicators.

Delphi Method

Delphi expert questionnaire Survey

The consensus conclusions drawn from Focus Group Interviews provide the framework for structuring the Delphi expert questionnaire [23,32]. This process unfolds through distinct review rounds:

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First Round: Experts assess the results of 25 decision-making indicators identified in the Focus Group Interviews, offering feedback on each item. They have the option to "retain," "delete," "merge," "modify," "add supplementary," or "classify into policy directions."

Second Round: Experts further refine and validate the strategy factors, integrating them into appropriate key factors.

The primary objective of employing the Delphi method in this study is to provide key factors for the Analytic Hierarchy Process (AHP). Recognizing the importance of streamlining the AHP implementation process, it is crucial to limit the number of hierarchical factors to ensure experts' willingness and efficiency in completing the questionnaire.

Delphi Method Expert Selection

For the Delphi expert selection, following the guidelines proposed by Murry and Hammons (2005), the researcher establishes criteria for expert selection using purposive sampling, as detailed in Table 1. Experts are invited from across Taiwan, provided they have current involvement in hot spring affairs. This includes individuals such as hot spring academic researchers, hot spring industry managers, and hot spring policy managers, each boasting a minimum of 6 years of experience in hot spring research or management. A total of 12 experts are invited to participate in the Delphi method.

Table 1: Criteria for Delphi method expert selection.

1	Experts with publications or research experience in hot springs-related studies.
2	Experts with publications or research experience in tourism and recreation.
3	Relevant managers involved in hot spring policy promotion.
4	Managers in government units responsible for industrial development or leisure tourism culture.
5	Managers or executives responsible for hot spring industry operations.

Analytic Hierarchy Process

AHP Expert Questionnaire Survey

The AHP model is utilized to evaluate the weights of the key factors in this study [33,34]. Based on the consensus conclusions reached through the second round of the Delphi method, the researcher formulated dimensions to identify suitable key factors for the AHP expert questionnaire. The AHP assessment scale comprises five levels of importance, ranging from "equally important" (1) to "extremely important" (9), with intermediate values for nuanced evaluation. Experts assessed the relative importance of dimensions and key factors accordingly. The process involves the following steps:

i. Selection of evaluation dimensions and key factors for constructing the AHP expert questionnaire.

ii. Construction of the hierarchical structure of the evaluation model.

iii. Establishment of pairwise comparison matrices for all dimensions and key factors.

iv. Conducting consistency testing and calculating the weights of all dimensions and key factors using Expert Choice 5.0 software.

v. Determination of the final aggregation appropriateness ratings and prioritization of all dimensions and key factors.

AHP Expert Selection

The criteria for AHP expert selection align with those of the Delphi method. The initial list comprises experts from the Delphi method, supplemented by additional experts based on predefined criteria. This comparative approach aims to assess variances between experts who participated in the Delphi method and those who did not during the AHP survey. A total of 18 experts participate, in the AHP, including 7 academic professors, 2 government tourism department chiefs, and 7 hot spring resort managers.

Data Collection and Processing

Delphi Method Data Analysis

Upon collecting valid questionnaires from the second round of the Delphi method, the researcher proceeded with coding and data input. Statistical analysis was conducted using SPSS 18.0 and Excel 2013 software, calculating various key factors to gauge consensus and divergence among expert opinions.

Analytic Hierarchy Process Data Analysis

Expert Choice 11.5 software facilitated the analysis, being designed upon the theoretical framework of the AHP [35]. The tool, developed by one of the founders of the AHP theory, Saaty, aimed to streamline calculations and reduce redundancy. It utilized the inconsistency ratio (I.R.) as a measure of agreement, with an overall inconsistency ratio (O.I.R.) ≤ 0.1 deemed acceptable [21,34].

Results and Discussion

Focus Group Interviews

After direct oversight by the chief of Tainan's tourism department, Focus Group Interviews were conducted, guided by

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researchers who supported four issues and 39 criteria. These discussions involved 8 participants from various sectors within the hot spring industry, ensuring a comprehensive range of opinions. Subsequently, the researcher reorganized and summarized the decision-making indicators related to hot spring districts. The results, presented in Table 2, were distilled from the Focus Group Interviews. Finally, the moderator synthesized the consensus drawn from the Focus Group Interviews into 25 decision-making indicators, which were further categorized into four dimensions: Legal Management (6 indicators), Tourism Services (7 indicators), Brand Marketing (6 indicators), and Sustainable Development (6 indicators).

Table 2: Decision-making indicators of hot spring districts in Taiwan: insights from Focus Group Interviews.

1. Legal Management
1.1 Establish and formulate hot spring district management plans
1.2 Designate hot spring exposure ranges
1.3 Implement supply for business service functions
1.4 Guide hot spring emblem acquisition and regular business assessment
1.5 Inspect and penalize illegal use
1.6 Establish hot spring development management exchange platform
2. Tourism Services
2.1 Convenient public transportation system
2.2 Sufficient parking facilities
2.3 Integrated management and beautification of tourist destination recreation facilities
2.4 Promote regional recreational itinerary packaging
2.5 Introduce Information and Communication Technology (ICT) services
2.6 Organize activities combining local characteristics
2.7 Establish a regular guided tour service system for hot spring districts
3. Brand Marketing
3.1 Establish tourist destination identification system and marketing figures
3.2 Produce and disseminate brand advertisements
3.3 Forge domestic and international hot spring cooperation
3.4 Establish brand network community marketing
3.5 Establish hot spring expo promotion platform
3.6 Market pre-sale of summer hot springs
4. Sustainable Development
4.1 Promote overall planning for hot spring communities
4.2 Promote the quality improvement and renewal of old hotels
4.3 Introduce hot spring care services
4.4 Commercialize high-value hot spring products
4.5 Reward hot spring utilization research
4.6 Establish a hot spring resource information knowledge base

Delphi Questionnaire Survey

The results from the Focus Group Interviews, comprising four dimensions and 25 indicators, guided the structuring of the Delphi questionnaire. Twelve experts participated in the Delphi process, refining decision-making indicators based on valid responses in the second round and integrating them into key factors across the four dimensions. The questionnaire was then adjusted, condensing the initial 25 indicators from the Focus Group Interviews into 16 key factors distributed among the dimensions: Environmental Attributes, Supporting Facilities, Health and Sanitation Facilities, and Marketing and Promotion, with each dimension comprising four key factors. These results, essential for AHP, are summarized in Table 3.

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Table 3: Key factors for enhancing hot spring districts in Taiwan: Delphi survey findings.

1. Environmental Attributes
1.1 Excellent Quality of Hot Spring Water: Certified natural spring water.
1.2 Beautiful Landscape: Creates a relaxing ambiance, encourages revisits.
1.3 Rich Eco-Resources: Abundant flora and fauna enhance attraction.
1.4 Relaxing Natural Environment: Helps relieve mental and physical stress.
2. Supporting Facilities
2.1 Authentic Local Cuisines: Unique dishes reflecting local culture.
2.2 Comfortable Accommodation: High-quality lodging options.
2.3 Convenient Transportation: Easy access through online booking and transport info.
2.4 Well-Planned Package Tours: Diverse tour options meeting various preferences.
3. Health and Sanitation Facilities
3.1 Variety of Hot Spring Facilities: Diverse SPA options catering to different needs.
3.2 Wide Range of Exercise Facilities: Indoor and outdoor options for fitness enthusiasts.
3.3 Good Sanitary Environment: Regularly maintained and transparently reported.
3.4 Well-Planned Wellness Services: Detailed guidance and health consultations.
4. Marketing and Promotion
4.1 Organize Local Specialty Events: Highlight local culture and festivals.
4.2 Produce Mass Media Advertisements: Increase brand exposure through various media channels.
4.3 Participate in Travel Exchange Activities: Engage in industry events to boost visibility.
4.4 Provide One-Stop Service: Centralized services via official platforms or centers.

Comparison between the results in Table 2 and Table 3 highlights a significant evolution. Initially, the Focus Group Interview results delineated four dimensions: Legal Management (6 indicators), Tourism Services (7 indicators), Brand Marketing (6 indicators), and Sustainable Development (6 indicators). However, Delphi experts refined these dimensions, also adjusting their terminology to better suit the context of hot spring districts in Taiwan. For instance, "Sustainable Development" was redefined as "Environmental Attributes" unanimously by Delphi experts. "Tourism Services" and "Brand Marketing" were amalgamated into "Supporting Facilities" and "Marketing and Promotion," respectively. "Legal Management" was omitted as all legal considerations were deemed integral across all dimensions.

Additionally, Delphi experts introduced a new dimension called "Health and Sanitation Facilities," which involved reclassifying the 25 decision-making indicators from the Focus Group Interviews. Consequently, 16 key factors were refined and incorporated into the revised dimensions by Delphi experts. This adjustment process, under the guidance of Delphi experts, sought to pinpoint crucial and pertinent key factors for the advancement of hot springs in Taiwan. While Focus Group Interviews enable thorough discussions among stakeholders, the Delphi questionnaire offered a structured platform for experts to evaluate the relevance of each key factor, providing a broader perspective that encompasses hot spring districts nationwide.

In the pursuit of evidence-based policymaking, challenges such as competing stakeholder demands, difficulty in official problem recognition, and ineffective government actions are encountered [36,37]. Rip suggests that an open-closed approach can resolve this dilemma [38]. This study utilized outcomes from Focus Group Interviews followed by a Delphi questionnaire survey to effectively gather stakeholder opinions. Cairney and Head argue that evidence-based practice offers effective solutions by enabling policy managers to critically evaluate evidence's validity, generalizability, and applicability, alongside identifying the best available evidence [39,40]. Through the Delphi questionnaire survey, issues were oriented towards sustainable development objectives and better aligned with policy decisions, marking a crucial step in exploring "evidence-based policy formulation."

AHP Expert Questionnaire Survey

Following the questionnaire design phase, a group of 18 experts actively engaged in the hot spring industry was invited to participate in the survey. This cohort comprised 9 managers from travel agent companies and hot spring resorts, 2 government officials, and 7 academic scholars, each with over a decade of experience in the hot spring field. Upon the return of the questionnaires, meticulous scrutiny ensued to ensure the consistency index (C.I.) of each matrix within every layer was less than or equal to 0.1 [21]. Subsequently, 8 questionnaires with any C.I. value exceeding 0.1 were removed to mitigate potential errors,

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resulting in a response rate of 55.56%. Following the consistency testing, the remaining 10 questionnaires underwent analysis to determine the relative weights of evaluation criteria at each level, thereby facilitating the assessment of the importance of each dimension and criterion.

The AHP provides a systematic framework for evaluating complex decision-making scenarios, offering valuable insights into the relative importance of various factors influencing the development of hot spring districts in Taiwan. The AHP results, delineated in Table 4 and Figure 1, unveil the relative weights (Dimensions Weight, DW) and rankings (R) at the dimension analysis level: "Environmental Attribute (DW=0.403, R1)," "Health and Sanitation Facilities (DW=0.253, R2)," "Supporting Facilities (DW=0.179, R3)," and "Marketing and Promotion (DW=0.165, R4)." These rankings underscore the pivotal role of environmental attributes and health and sanitation facilities in shaping visitors' experiences at hot spring districts, emphasizing their significance in meeting the fundamental needs of relaxation and rejuvenation sought by visitors.

Table 4: The normalized weights and integrated weights of each layer were determined through the AHP expert questionnaire survey.

Dimensions (A)	Factors	Normalized (B)	Integrated (C)
1. Envir. 0.403 (1)	1.1 Excellent Quality of Hot Spring Water	0.385 (1)	0.156 (1)
	1.2 Beautiful Landscape	0.276 (2)	0.111 (2)
	1.3 Rich Eco-Resources	0.181 (3)	0.073 (4)
	1.4 Relaxing Natural Environment	0.158 (4)	0.064 (6)
	2.1 Authentic Local Cuisines	0.197 (3)	0.035 (12)
2. Support 0.179 (3)	2.2Comfortable Accommodation	0.273 (2)	0.049 (10)
	2.3 Convenient Transportation	0.350 (1)	0.062 (7)
	2.4 Well-Planned Package Tours	0.180 (4)	0.032 (14)
	3.1 Variety of Hot Spring Facilities	0.245 (3)	0.062 (7)
3. Health 0.253 (2)	3.2 Wide Range of Exercise Facilities	0.122 (4)	0.031 (15)
	3.3 Good Sanitary Environment	0.349 (1)	0.088 (3)
	3.4 Well-Planned Wellness Services	0.284 (2)	0.072 (5)
	4.1 Organize Local Specialty Events	0.333 (1)	0.055 (9)
4. Market 0.165 (4)	4.2 Produce Mass Media Advertisements	0.271 (2)	0.045 (11)
	4.3 Participate in Travel Exchange Activities	0.186 (4)	0.031 (15)
	4.4 Provide One-Stop Service	0.210 (3)	0.035 (12)

Note: Numbers in parentheses are ranks. (A) = Dimensions Weight; (B) = Normalized Weight; (C) = Integrated Weight = (A)*(B).

Abbreviations: Envir: Environmental attribute; Support: Supporting facilities; Heath: Health and sanitation facilities ; Market: Marketing and promotion.

Referring to industry standards [26], the researcher pinpointed 6 key factors essential for boosting hot spring districts in Taiwan: "Excellent Quality of Hot Spring Water (IW=0.15, R1)," "Beautiful Landscape (IW=0.111, R2)," "Good Sanitary Environment (IW=0.088, R3)," "Rich Eco-resources (IW=0.073, R4)," "Well-planned Hot Spring Wellness Service (IW=0.072, R5)," and "Relaxing Natural Environment (IW=0.064, R6)." Notably, industry experts stressed the significance of nature-related aspects in attracting customers. Conversely, factors like "Wide Range of Exercise Facilities (IW=0.0031, R16)," "Participation in Travel Exchange Activities (IW=0.031, R15)," and "Well-planned Package Tours (IW=0.032, R14)" received lower rankings, indicating their perceived lesser importance in driving visitor satisfaction and destination attractiveness.

These results align with recent research emphasizing the importance of sustainability-related attributes in post-COVID-19 hot spring tourism, with recommendations focusing on enhancing destination sustainability to maintain market competitiveness [4]. Similarly, the growing trend of health tourism, driven by increasing emphasis on quality of life and demographic shifts towards an aging population, has positioned hot spring resorts as sought-after destinations for holistic wellness experiences. For example, studies examining health tourism products for domestic tourists in Korea have provided valuable insights for industry practitioners seeking to capitalize on this burgeoning market segment [41].

Among these key factors, the outstanding quality of natural hot spring water emerges as the most critical criterion for the success of hot spring districts. The act of immersing oneself in hot spring water to relieve physical fatigue and rejuvenate constitutes the primary motivation for visitors. Various types of spring water, including sulfide-rich, carbonate-rich, and high-mineral spring water, each boasting unique therapeutic effects, can cater to diverse consumer segments with different needs.

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Therefore, by highlighting the excellent quality and distinctive healing properties of their hot spring water, resort operators can distinguish and elevate the image of their resorts.

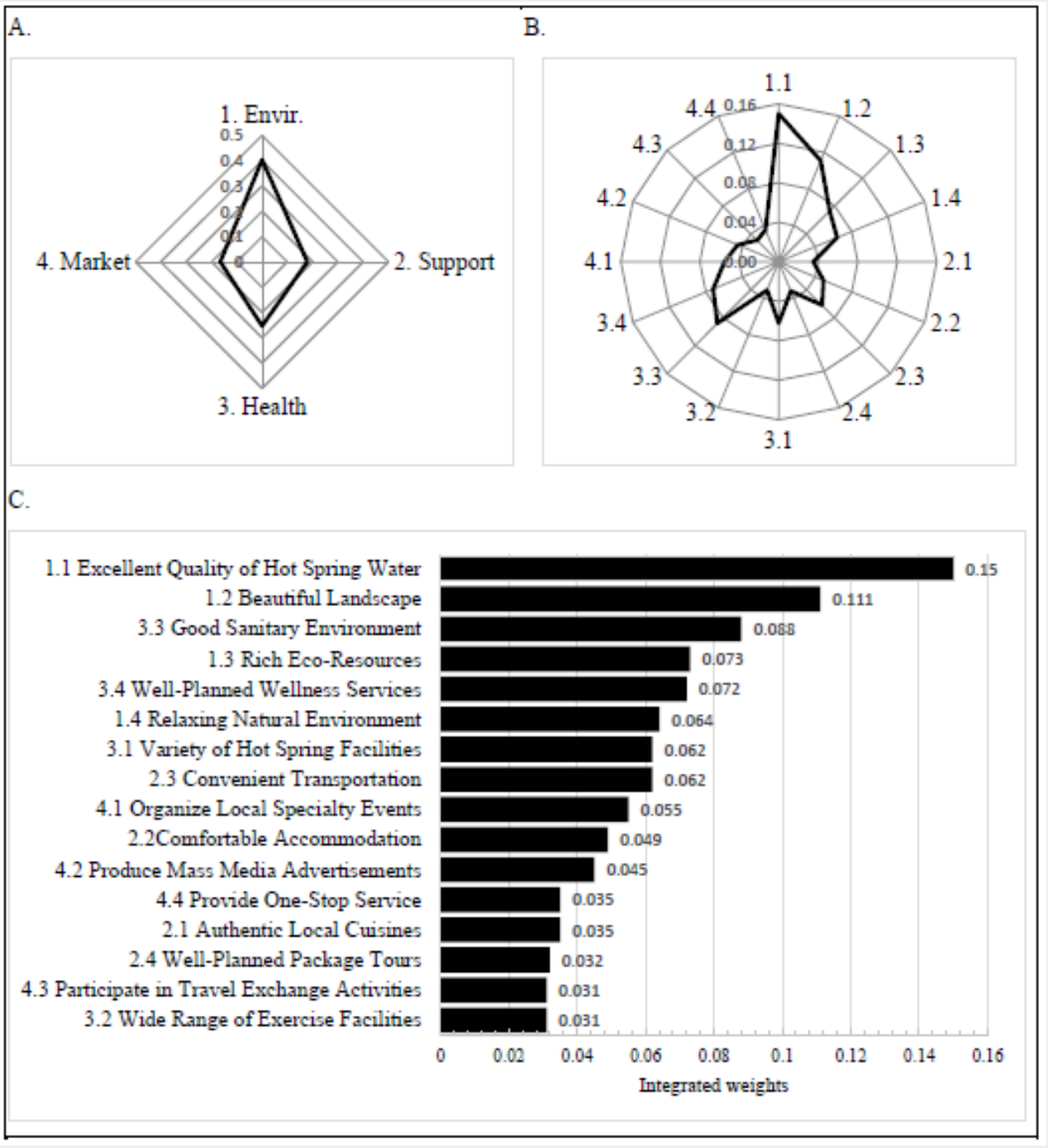

Figure 1: Analytic Hierarchy Process (AHP) key factors overall weight analysis (synthesis with respect to goal).

Note: A. Radar chart illustrating the Weight of four Dimensions.

B. Radar chart showing the Integrated Weight of 16 Factors, identified by codes as in C.

C. Chart presenting the ranking of Factors Integrated Weight.

Abbreviations: Envir: Environmental attribute; Support: Supporting facilities; Heath: Health and sanitation facilities; Market: Marketing and promotion.

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Moreover, key factors such as beautiful landscapes, rich eco-resources, good sanitary conditions, and a serene environment complement the relaxation experience, further underscoring the significance of nature- related amenities. Therefore, it is imperative for resort operators to prioritize sourcing high-quality hot spring water and maintaining picturesque natural surroundings, ensuring sustainable management of the hot spring source and water quality to create a natural sanctuary for customers.

Conclusion

This study utilized a combination of Focus Group Interviews, the Delphi method, and Analytic Hierarchy Process (AHP) to explore the perspectives of hot spring experts on the key factors shaping hot spring districts in Taiwan. The findings underscored the significance of six key factors-specifically, "Excellent Quality of Hot Spring Water," "Beautiful Landscape," "Good Sanitary Environment," "Rich Eco- resources," "Well-planned Hot Spring Wellness Service," and "Relaxing Natural Environment"-all intricately tied to the natural surroundings. It emphasizes the pivotal role of a pristine and serene natural environment, alongside robust sanitary conditions, in the success of hot spring districts. The integration of research insights from Focus Group Interviews, the Delphi method, and AHP facilitated the alignment of development initiatives with sustainable goals, aiding evidence-based policy formulation. Moreover, insights from experts participating in the Delphi and AHP processes revealed that hot spring resorts with high-quality hot spring water and scenic surroundings gain a competitive edge in meeting customers' fundamental needs for mental and physical relaxation. Considering these findings, we advocate for resort operators to preserve their natural surroundings while enhancing wellness services to ensure sustainable development. These results not only enhance the appeal of hot spring districts but also reinforce the long- term viability of hot spring resorts in Taiwan.

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