

Article

# Investigation of West Lake Ecotourism Capabilities Using SWOT and TOPSIS Decision-Making Methods

Yihao Zhu <sup>1</sup>, Chou Chen <sup>2</sup>, Guodao Zhang <sup>3</sup> , Zimin Lin <sup>4,\*</sup>, Sarita Gajbhiye Meshram <sup>5</sup>  and Ehsan Alvandi <sup>6</sup>

<sup>1</sup> School of Economics and Management, Zhejiang Ocean University, Zhoushan 316022, China

<sup>2</sup> Department of Public Education, Wenzhou University of Technology, Wenzhou 325000, China

<sup>3</sup> Department of Digital Media Technology, Hangzhou Dianzi University, Hangzhou 310018, China

<sup>4</sup> Department of Planning and Finance, Zhejiang College of Security Technology, Wenzhou 325000, China

<sup>5</sup> WRAM Research Lab Pvt. Ltd., Nagpur 440027, Maharashtra, India

<sup>6</sup> Department of Watershed Management, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan 49189-43464, Iran

\* Correspondence: 22116529@zjst.edu.cn

**Abstract:** Using SWOT and TOPSIS models, this study aimed to determine West Lake's potential as a tourist destination. In terms of study methodology, the current research is a descriptive survey. The TOPSIS method was used to rank strengths, weaknesses, threats, opportunities, and preferred strategies after the SWOT analysis was completed. Using a questionnaire and the Delphi method, 30 regional specialists provided research data which was collected and analyzed. Thirteen internal elements and twelve external factors affecting the West Lake tourism were identified and evaluated. Additionally, fifteen strategies were presented to improve the lake's tourism. On the basis of the matrix of internal–external components in the SWOT model, an aggressive approach was determined to be the optimal strategic stance for West Lake. The results of the TOPSIS technique also revealed that internal strengths have a bigger impact than other elements; hence, aggressive strategies are emphasized for the growth of ecotourism in this region. Based on the results of the TOPSIS technique, the “optimal utilization of the lake's natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues” and “formulation of strategic plans to maximize potential and opportunities in order to attract tourists in all seasons of the year” strategies were identified as the most important strategies for enhancing the West Lake tourism scenario. Therefore, it is hoped that the relevant authorities would contribute to the expansion and enhancement of the region's economy through a focus on the vision and goals of the tourist sector and careful foresight in the implementation of these projects.

**Keywords:** tourism industry; SWOT method; TOPSIS method; West Lake; Hangzhou City



**Citation:** Zhu, Y.; Chen, C.; Zhang, G.; Lin, Z.; Meshram, S.G.; Alvandi, E. Investigation of West Lake Ecotourism Capabilities Using SWOT and TOPSIS Decision-Making Methods. *Sustainability* **2023**, *15*, 2464. <https://doi.org/10.3390/su15032464>

Academic Editor: Tsung Hung Lee

Received: 31 December 2022

Revised: 21 January 2023

Accepted: 23 January 2023

Published: 30 January 2023



**Copyright:** © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

As the largest service business in the world, tourism has a unique role and position in regional development and is regarded as one of the most effective means of enhancing environmental capabilities and sustainable development [1]. Tourism is currently becoming one of the most important cornerstones of the global economy. Numerous development planners and policymakers cite tourism as the principal column of sustainable development which, with good and principled planning and identification of opportunities and constraints, may play an important part in the economic diversification of the nation [2].

Nowadays, discussion and concern about natural hazards and factors threatening the development of tourism systems have been given serious attention. One of the most important factors that make people revisit a destination is the security of that destination. Tourism risks can be defined as “the possibility of unpleasant incidents occurring during the trip, especially at the destination” [3].

While tourism has many positive effects and is expanding day by day, the incidents and risks that threaten it need to be discussed. The important issue is that there should always be a coherent system for supporting, planning, and managing tourism in times of crisis and before the crisis occurs. Therefore, in the planning process of tourism development, in order to prevent risks and harmful factors and in order to prevent disruption in the tourism system, possible factors and risks must be identified and evaluated first, and then curbed. Tourism development is one issue that first of all requires proper planning and management [4].

Planning entails the ability to anticipate future occurrences, assess and evaluate conditions, and think creatively in order to develop effective solutions [5]. Tourism development planning is as vital as planning for any other type of growth. Tourism can directly and indirectly generate a variety of economic, social, and cultural benefits; therefore, planning is required to find the ideal type of tourism that has no negative environmental impacts. Therefore, it may be claimed that planning for the revitalization or development of touristic sites is crucial [6].

To maintain the long-term viability of the region's resources, the strategic plan focuses on identifying the region's strengths and weaknesses and adapting those to environmental challenges and opportunities [7]. Strategic planning is more adaptable than other approaches when faced with crucial conditions. This competence is a result of the fact that this style of planning is concerned with identifying strengths, weaknesses, opportunities, and threats. In this approach, critical and strategic topics pertaining to the system and the surrounding environment are constantly examined [8].

Using the SWOT (strengths, weaknesses, opportunities, and threats) matrix, one may determine the external threats and opportunities, as well as the internal weaknesses and strengths, of a system in order to devise a strategy for directing and managing the system. SWOT analysis is predicated on the idea that a successful plan optimizes strengths and opportunities while reducing weaknesses and threats [9]. In reality, this is the most effective technique for corporations. The tourist business has garnered a considerable deal of attention from numerous scientific disciplines and governments. On the one hand, tourism is important for its economic contributions, and on the other, for its cultural and social benefits. Due to the fact that utilizing a region's tourist potential can create a dynamic and active foundation for that region's growth, the analysis of this potential is inevitable [10].

A review of studies undertaken in the field of management strategy evaluation reveals that SWOT analysis is one of the tactical methodologies for developing, designing, and extracting management strategies in numerous fields, including agriculture and tourism [11]. In addition, the study literature demonstrates that SWOT analysis is typically used in conjunction with other complementary approaches, such as analytical hierarchy process (AHP), analytic network process (ANP), and technique for order preference by similarity to ideal solution (TOPSIS), etc., to propose scientific plans and quantify their significance and prioritization [12–14]. However, there is consensus on the use of SWOT analysis for the initial stage of strategic management. This technique of analysis has been used in studies of the development of the tourism industry to pinpoint influential factors and suggest policy changes [15–17]. This study addresses the internal environment's weaknesses and strengths, as well as the external environment's threats and opportunities, in the context of tourism activities [18].

Along with technical advancements, there are a growing number of theoretical and operational experiences throughout the world for analyzing, investigating, planning, and managing tourism [19–21]. Torabi et al. [22], during research, introduced geotourism and geoparks as new strategies for socioeconomic development. Chuentarawong [23] presented tourism management programs in Chiang Rai. Büyüközkan et al. [17] in their study chose health tourism strategy through SWOT analysis.

In addition, several studies have been undertaken around the world on tourism, strategic planning, and SWOT analyses [24–28]. Karoubi et al. [25] used the SWOT matrix-fuzzy

TOPSIS technique in order to develop a strategic tourism plan. Yan et al. [27] studied the development of the tourism industry based on SWOT analysis in Nishan Town. Ghorbani et al. [29] explored ecotourism's sustainable development techniques in South Khorasan's Kaji Namakzar wetland using the SWOT and QSPM models. Using the SWOT framework, Yazdani et al. [30] investigated how ecotourism may be developed sustainably in the Cherat watershed in the Iranian province of Mazandaran. Using the ANP model, García-Melón et al. [31] investigated the effects of tourism in the Coastal NP area of Venezuela. Aminu et al. [32] examined the sustainable tourist planning in Cameron Highlands, Malaysia, using network analysis and geographic information system. In Indonesia, Marlina [33] proposed geotourism as a strategy to promote the sustainability of geographical sites. The sustainable growth of ecotourism was studied by Arsich et al. [34] in Serbia's Djerdap National Park. The Santa Elena Province, Ecuador Geopark project's potential for attracting more tourists was recently evaluated by Herrera [35].

Solving multi-criteria decision-making problems is complex, especially when those criteria conflict with each other: increasing the desirability of one can reduce the desirability of another. For this reason, methods called multi-criteria decision-making (MCDM) and in particular multi-attribute decision-making (MADM) have been developed to help solve these problems [36]. Multi-attribute decision-making methods have a variety of techniques at different stages of decision-making. The decision-making technique, by exchanging various indicators, identifies the option that has the highest position [37].

In multi-attribute compensatory decision models, all indicators are considered to make the final decision and in them, exchanges take place between indicators. This means that a change in an index is offset by an opposite change in the index or other indices. The TOPSIS (technique for order preference by similarity to ideal solution) compensatory MADM technique was used to trade off the impacts. The TOPSIS model belongs to the compromising subgroup. In this model, similarity to the ideal solution is the main criterion in choosing [38]. The application of multi-criteria decision-making methods in various fields has been considered by many researchers [39–43]. Alvandi et al. [40] proposed a scenario-based approach and multi-criteria decision-making for integrated management of the Bonekooh watershed in Tehran Province, Iran. Meshram et al. [41] proposed SAW and TOPSIS approaches for prioritizing watersheds. Yang et al. [42] used the improved TOPSIS method for environmental risk assessment.

At present, the West Lake Scenic Area in China is changing from a single tourist tourism economy to a comprehensive industrial tourism economy, and has developed into a multi-level, wide-range and all-round ecological tourism industry, to provide more services for tourists. Generally, a scenic area refers to an area with ornamental, cultural or scientific value, a concentrated natural and cultural landscape, or a beautiful environment, for people to visit or carry out scientific and cultural activities. The economic model of West Lake can be defined as an "agricultural post-industrial society" economic model. Its industrial structure presents a prominent tourism industry and the lack of secondary industry and industrial structures is increasingly serious and contradictory. Nowadays, people's demand for tourism is gradually becoming diversified, in contrast to the past demand for single tours, so the West Lake Scenic Area is transforming from a single tourism economy to a comprehensive industrial tourism economy, with the purpose of bringing pleasure to customers. West Lake Scenic Area is not only a 5A scenic area in China, but also one of the main drawcards of Chinese tourism. A 5A scenic area refers to the quality classification of tourist attractions in the People's Republic of China. It is divided into five levels, from high to low, including AAAAA, AAAA, AAA, AA and A, so 5A is the highest level of China's tourist attractions, representing the world-class quality of China's scenic spots. According to the Ministry of Culture and Tourism, PRC, there were forecast to be 318 5A scenic areas in China by 2022.

The necessity and significance of this research stems from the fact that West Lake, which has unique natural and cultural characteristics for tourism development, has not received the attention it deserves. If more attention is focused on tourism in this region,

it will have significant economic benefits and contribute to the region's development. Addressing the development of the tourism industry within the context of sustainable tourism development concepts also necessitates the application of measures and techniques that transform development visions and strategies into applicable and environmentally compatible operational plans and measures (natural and social aspects). In light of the existing deficiencies, it is vital to examine and design plans for the growth of tourism in this region. In this sense, each phase of strategic planning requires the participation of tourism specialists.

To achieve the research objective, for the current study we conducted strategic planning by assessing internal and external issues and considering answers and plans for expanding tourism in the region. In light of the region's potential, the creation of such an executive plan to promote tourism in WestLake seems essential. Towards this goal, we employed a SWOT analysis and TOPSIS decision-making techniques. Consequently, the originality of this study stems from its approach to indicator selection and its unique set of indicators. The merging of two applicable approaches, namely TOPSIS and SWOT, is an additional strength of this study. In light of the significance of the issue, the present research was conducted with the following goals:

1. Determining the internal (strengths and weaknesses) and external (opportunities and threats) variables influencing the development of the West Lake tourism;
2. Identifying and developing suitable strategies for the growth of the West Lake tourism industry;
3. Ranking strategic initiatives according to the West Lake tourism industry's key factors.

In light of these concerns and aims, the following research questions were posed: What are the best strategies for the growth of the West Lake's tourism, and how should the strategies be prioritized?

## 2. Materials and Methods

### 2.1. The Study Area

West Lake is located in the West Lake District of Hangzhou city, Zhejiang Province. West Lake has a scenic area of 49 km<sup>2</sup>, its watershed is 21.5 km<sup>2</sup> and the lake level is 6.4 km<sup>2</sup> (Figure 1). West Lake is limited by mountains in three geographical directions. The lake has an oval shape; its bottom is relatively flat and the average water depth is about 3 m. There are more than 100 scenic spots in and around the West Lake, more than 20 museums and more than 60 key cultural relic protection units. The famous scenic spots include Broken Bridge, Su Causeway, Leifeng Pagoda, and so on. Among the most important problems of the West Lake, the following can be mentioned.

#### 2.1.1. Urbanization of Scenic Spots

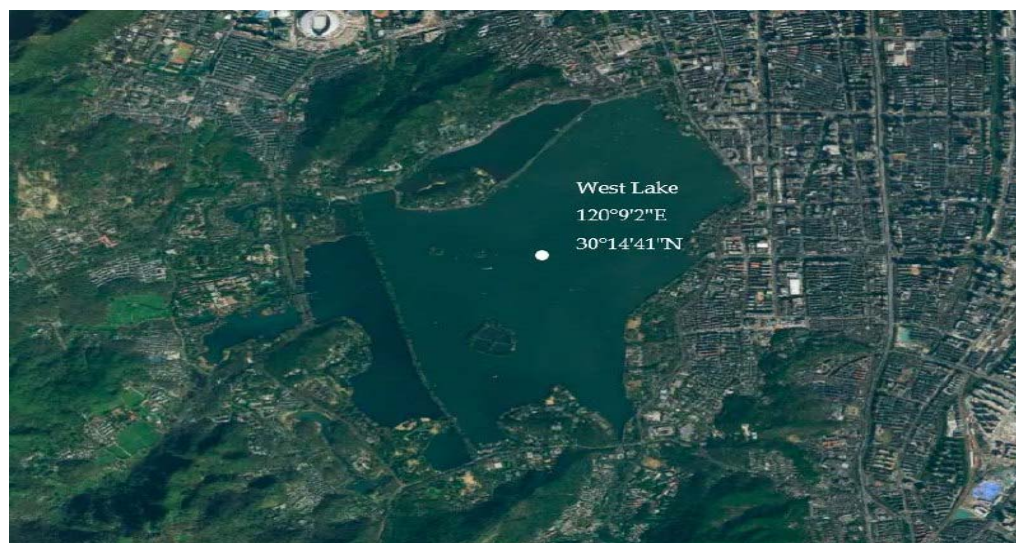
The total number of permanent residents in the West Lake Scenic and Historic Interest Area is 54,031 (excluding temporary residents). Units and residential land account for 40% of the share, and the development momentum is increasing, resulting in excessive expansion of the population of the scenic spots. The residential buildings in the scenic spots are too dense, the phenomenon of urbanization in the scenic spots is very prominent, and the village buildings are of monotonous architectural style, seriously affects the visual aspect of the landscape. This directly hinders the sustainable development of scenic spots.

#### 2.1.2. Uneven Distribution of Sightseeing Activities

At present, there is still a large number of scenic spots in the West Lake, which causes the unbalanced development of tourist activities. On the one hand, a large number of tourists are concentrated in a few main scenic spots, so that these scenic spots are overloaded during holidays and even non-holidays, which seriously affects normal sightseeing and hinders the sustainable development of ecology and the environment of scenic spots; on the other hand, the scenic resources of high value of the West Lake mountain area have not been explored and utilized, and tourists cannot be evacuated reasonably and effectively, so



that for visitors in the scenic areas visit time is too short, affecting the overall understanding of the scenic area.



**Figure 1.** Geographical location of the study area, West Lake.

### 2.1.3. Improper Use of Resources

The resources of scenic spots have multiplicity. However, at present, there are some misplacement phenomena in the utilization of these multiple scenic resources, such as pumping groundwater and intercepting streams as living and production water, discharging sewage on the spot, resulting in damaged water features and polluted water sources, blindly meeting traffic needs and introducing parking lots and roads into the core scenic spots, all of which have caused the impact and destruction of landscape resources.

## 2.2. Research Methodology

According to the aims, this was an applied study and it employed a descriptive–analytic approach. On the one hand, the status quo has been defined through the collection of data and information, and on the other hand, the consequences of tourism on the development of the region have been explored. The method of data collection was a combination of literature review and fieldwork (via questionnaire). This study’s conceptual framework is a combination of qualitative and quantitative methodologies.

Exploratory mixed methods were employed to acquire data and information for this study. In the exploratory mixed technique, qualitative data collection came first. The researcher attempted to collect quantitative data in order to strengthen the generalizability of the qualitative data’s findings. According to what has been stated, the current research was divided into two phases: initially, in the qualitative phase of the research, the researcher conducted preliminary interviews with managers, experts, and informed professionals in the field of tourism in order to identify the field’s strengths, weaknesses, opportunities, and threats. After completing this step, which involved the analysis of the retrieved data, in the second phase, questionnaires were designed and distributed to collect quantitative data.

Khazaei et al. [44] also used the SUS (system usability scale) method to evaluate the capabilities of the SHMS system. The SUS method is popular since it is reliable even with a few participants and has a relatively concise evaluation criterion [45]. This method consists of a set of questions where even-numbered items assess the positive statements and odd-numbered items assess the negative statements. Usability measurements can be conducted in a “quick and dirty” way with the SUS [46].

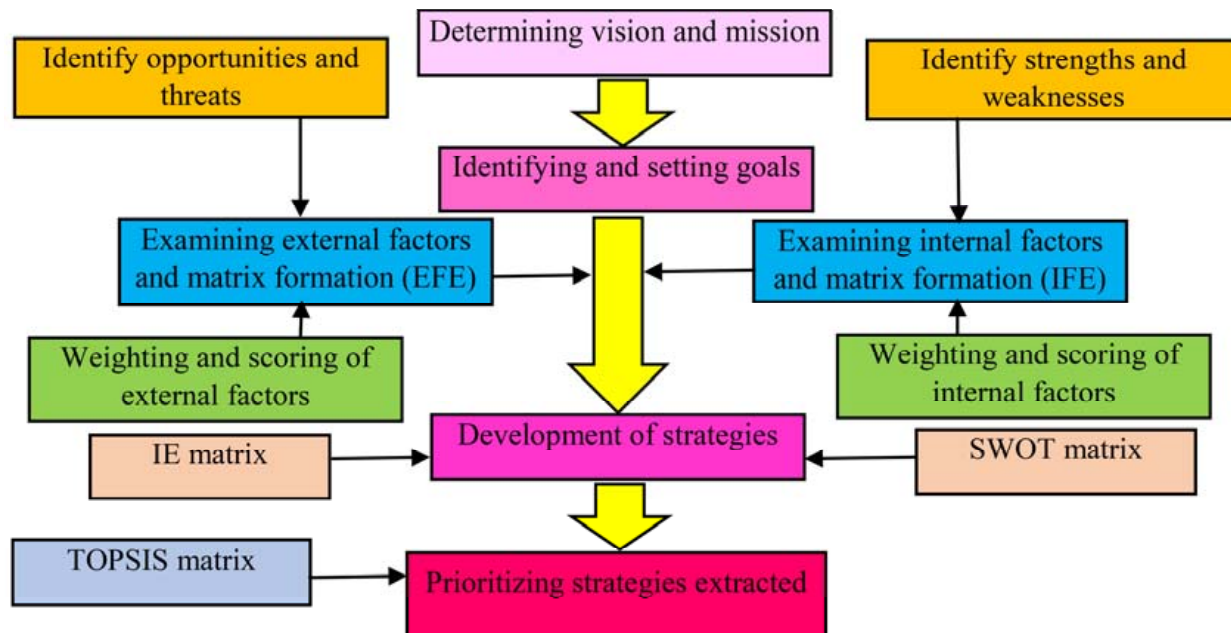
In order to determine the West Lake’s strengths, weaknesses, opportunities, and threats, managers, experts, and tourism-industry specialists were interviewed following a survey of scientific sources. Finally, a summary of the West Lake’s strengths, weaknesses,

opportunities, and threats was compiled. Following this stage, which involved the analysis of the extracted data, the second step of the research was conducted. A questionnaire was prepared and disseminated at this stage in order to weigh and analyze internal (strengths and weaknesses) and external (opportunities and threats) factors (Supplement S1).

The statistical sample of this research for the second and third stages and the Delphi method consisted of a group of tourism specialists, including: tourism-experienced professionals, university faculty members, senior managers of the public sector, and agency managers. Our cohort comprised thirty individuals with more than ten years of service experience. In this study, experts were chosen using the subjective sampling method (judgment type). In this strategy, individuals who can give the researcher the needed information are selected. For this reason, thirty tourism specialists with executive and scientific experience were chosen as the sample. A single-sample t-test was used to determine the significance level of respondents' answers regarding each of the strategic factors of the development of the West Lake tourism industry.

The Delphi method is a systematic and qualitative method of forecasting by collecting opinions from a group of experts through several rounds of questions. The Delphi method relies on experts who are knowledgeable about a certain topic so they can forecast the outcome of future scenarios, predict the likelihood of an event, or reach consensus about a particular topic.

In this study, the data were analyzed using the SWOT and TOPSIS techniques to find the ideal tourism arrangement and strategies to mitigate negative effects and internalize positive outcomes. Figure 2 depicts the research's flowchart. The TOPSIS method, which will be explained in greater depth in the following paragraphs, was used to decide the best course of action in the SWOT model, which involved first compiling a list of internal components (strengths and weaknesses) and external aspects (opportunity and threats).



**Figure 2.** Flowchart of research steps.

### 2.3. Strategic Planning Stages of Research

The strategic planning steps for this research are presented in Table 1 below [47].

**Table 1.** Strategic planning stages of research.

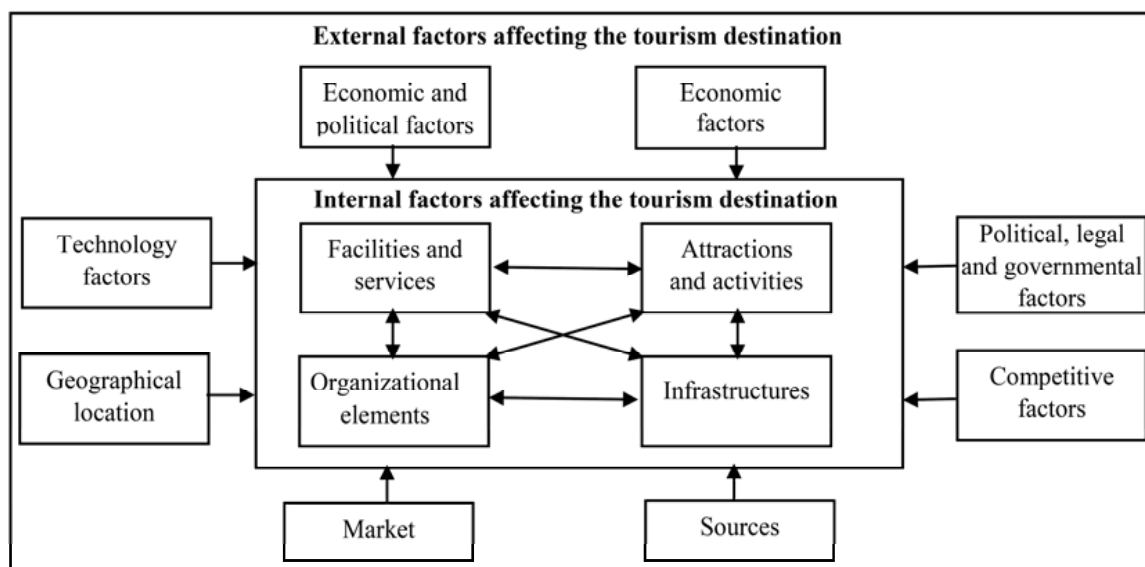
Strategy Levels	Stage	Description of Activities
Macro strategies	Start stage	- Determining vision and mission - Identifying and setting goals
	Input stage	- Examining internal factors and matrix formation (IFE) with coefficients and rankings - Examining external factors and matrix formation (EFE) with coefficients and ranking
	Comparison stage	- Forming a matrix of threats, opportunities, strengths, and weaknesses (SWOT)
	Decision stage	- Prioritizing strategies extracted using the TOPSIS method

- Start Stage

At this stage, the characteristics and components of the mission of a tourist destination are discussed. To formulate objectives, the area designated for tourism development should be assessed from multiple vantage points. This examination ensures that the goals stated are attainable and practical [47].

- Input Phase

Determining effective internal and external factors on strategy formulation is a step consisting of evaluation of the external environment and the evaluation of the internal environment. At this stage, effective internal and external factors of the tourism destination were recognized and analyzed using two methods: an external factors evaluation matrix and internal factors evaluation matrix. These are shown in Figure 3.



**Figure 3.** The model of factors influencing the formulation of tourism development strategies - Reprinted from Delbari and Rajabi (2012) [48].

Evaluation matrix of external factors (EFE): In this research, the following 5 steps were followed to prepare the evaluation matrix of external factors.

1. After examining the external factors, the known factors that cause opportunities or threats for the tourism destination were listed.
2. Determining the weight of factors: This weight is in the range of zero to one. Coefficients indicate the relative importance of a factor. Often, a higher coefficient is given to factors that create opportunities or success (compared to threatening factors).

At this stage, weights and coefficients were assigned to the previously enumerated factors. These coefficients for external elements (opportunities and threats) ranged from 0 to 1, indicating a factor's relative significance. West Lake's mission, perspective, and values were used to determine the coefficients of importance. For weighing the opportunities and threats, a questionnaire developed by researchers was utilized (Supplement S1). The experts were asked to provide a value between 0 and 1 to each of the opportunities and threats. In addition, the total weight of all opportunities and threats must equal 1. The average weights derived from the opinions of experts were then utilized as the basis for decision-making and the final weight of opportunities and threats.

3. Factors that lead to success were given a score of 1 to 4. This number shows the effectiveness of the current strategies of the system in showing the reaction to the mentioned factor. Number 4 is a high reaction, number 3 is an above average reaction, number 2 is an average reaction, and number 1 is a weak reaction. These points were determined according to the effectiveness of the system's strategies. In this stage, each factor (opportunities and threats) was ranked from 1 to 4 based on its effectiveness in achieving the ideal condition. For weighing the opportunities and threats, a questionnaire developed by researchers was utilized (Supplement S1). Towards this aim, each opportunity and threat was assigned a ranking between 1 and 4 by the experts. The average scores gathered from the opinions of experts were then utilized as the basis for decision-making and the final assessment of the West Lake's opportunities and threats.
4. The final weight of each factor was obtained by multiplying that factor by the corresponding score. Finally, using the arithmetic mean, the score of opportunities and threats was extracted.
5. Calculation of the total final score of each factor in order to determine the total final scores of the tourist destination: In the evaluation matrix of external factors, irrespective of the number of factors that cause opportunities or threats, the sum of the final scores of the system will never be more than 4 or less than 1. The average of this sum is 2.5. If the sum of these numbers reaches 4, it means that the system reacts very well to the factors that cause threats and opportunities.

Evaluation matrix of internal factors (IFE): In this research, the following 5 steps were followed to prepare the evaluation matrix of internal factors.

1. After examining the internal factors, the most important factors were listed. The elected factors include the strengths and weaknesses of the region's tourism system.
2. These factors were given a coefficient from 0 (unimportant) to 1. The relative importance of each factor in the success of the tourism industry system was determined by the coefficient given to the factor. In this stage, weights and coefficients were assigned to the previously enumerated factors. These coefficients for internal factors (strengths and weaknesses) ranged from 0 to 1, indicating a factor's relative significance. West Lake's mission, perspective, and values were used to determine the coefficients of importance. For weighing the strengths and weaknesses, a questionnaire developed by researchers was utilized (Supplement S1). The experts were asked to provide a value between 0 and 1 to each of the strengths and weaknesses. In addition, the total weight of all strengths and weaknesses must equal 1. The average weights derived from the opinions of experts were then utilized as the basis for decision-making and the final weight of strengths and weaknesses.
3. A score from 1 to 4 was given to each factor. Score 1 indicates basic weakness, score 2 indicates low weakness, score 3 indicates strength, and score 4 indicates very high strength of the discussed factor. In this stage, each factor (strength or weakness) was ranked from 1 to 4 based on its effectiveness in achieving the ideal condition. For weighing the strengths and weaknesses, a questionnaire developed by researchers was utilized (Supplement S1). Towards this aim, each strength and weakness was assigned a ranking between 1 and 4 by the experts. The average scores gathered from



the opinions of experts were then utilized as the basis for decision-making and the final assessment of the West Lake's strengths and weaknesses.

4. The final weight of each factor was obtained by multiplying that factor by the corresponding score. Finally, using the arithmetic mean, the score of strengths and weaknesses was extracted.
  5. Next followed calculation of the total final score of each factor in order to determine the total final scores of the tourist destination. Irrespective of the number of factors in the evaluation matrix, the sum of the final scores will be between 1 and 4, and their average is 2.5.
- Comparison Stage

The comparison stage of the framework for developing strategies contains ways for identifying relevant strategies. A strengths, weaknesses, opportunities, and threats, (SWOT) matrix was utilized for this aim in this study.

SWOT matrix: The SWOT matrix is one of the most important tools in the strategy formulation process. Four types of strategies can be presented using this matrix: SO, ST, WT, and WO strategies. In this research, the following eight steps were taken to create the SWOT matrix:

1. Prepare a set of main opportunities that exist in the external environment of the tourist destination;
2. Prepare a set of main threats that exist in the external environment of the tourist destination;
3. Prepare a set of main strengths of the tourist destination;
4. Prepare a set of major weaknesses of the tourist destination;
5. External opportunities and internal strengths were compared and the result was provided in the intended place in the SO strategy group;
6. External opportunities and internal weaknesses were compared and the result was written in the relevant place in the group of WO strategies;
7. External threats and internal strengths were compared and the result was written in the relevant place in the ST strategies group;
8. External threats and internal weaknesses were compared and the result was written in the relevant place in the WT strategies group.

In the SWOT matrix, in each step, two factors are compared and the goal is not to specify the best strategies, but to specify applicatory strategies. Therefore, all the strategies presented in the above matrix will not be selected and implemented.

- Decision Stage

In this step, the strategies obtained from the SWOT matrix were prioritized by the TOPSIS method.

TOPSIS method: The TOPSIS method of decision-making was utilized to choose the most effective options. This technique employs the notions of ideal and non-ideal solutions. In general, the concept of an ideal solution does not exist in actuality, and we strive to be as near to it as feasible. To make an alternative comparable to the ideal and non-ideal solutions, the distance between that option and the ideal and non-ideal solutions is determined. The alternatives are then reviewed and ranked depending on the distance ratio between the two extremes.

The steps of the TOPSIS method used in this research were as follows [49]: First, using Equations (1) and (2), the positive ideal solution and the negative ideal solution were calculated.

$$A^+ = \{(\max v_{ij} | j \in J_1), (\min v_{ij} | j \in J_2) | i = 1, 2, \dots, m\} \quad (1)$$

$$A^- = \{(\min v_{ij} | j \in J_1), (\max v_{ij} | j \in J_2) | i = 1, 2, \dots, m\} \quad (2)$$

$$A_i^+ = (v_1^+, v_2^+, \dots, v_n^+)$$

$$A_i^- = (v_1^-, v_2^-, \dots, v_n^-)$$

So that

$J_1 = \{1, 2, 3, \dots, n \mid \text{for positive index elements}\}$

$J_2 = \{1, 2, 3, \dots, n \mid \text{for negative index elements}\}$

where  $v_j^+$  is the best value of criterion  $j$  among all alternatives and  $v_j^-$  is the worst value of criterion  $j$  among all alternatives. The options that are placed in  $A^+$  and  $A^-$  indicate the completely good and completely bad options, respectively.

Then, the size of the distance from the positive ideal and the negative ideal was calculated using Equations (3) and (4).

$$d_i^+ = \left\{ \sum_{j=1}^n (v_{ij} - v_j^+)^2 \right\}^{\frac{1}{2}} \quad (i = 1, 2, 3, \dots, m) \quad (3)$$

$$d_i^- = \left\{ \sum_{j=1}^n (v_{ij} - v_j^-)^2 \right\}^{\frac{1}{2}} \quad (i = 1, 2, 3, \dots, m) \quad (4)$$

In these equations, index  $j$  represents the desired criterion and index  $i$  represents the desired option.

Finally, the relative proximity of the options from the ideal solution was calculated using Equation (5).

$$C_i = \frac{d_i^-}{(d_i^- + d_i^+)} \quad (i = 1, 2, 3, \dots, m) \quad (5)$$

The value of the « $C_i$ » changes between 0 and 1. Whenever the desired option is more similar to the ideal answer (further from the negative ideal answer), the value of its « $C_i$ » will be closer to one.

### 3. Results

#### 3.1. Inferential Data Analysis

In this research, using expert opinions, 6 opportunities, 6 threats, 7 strengths, and 6 weaknesses were identified in the tourism industry of West Lake. The significance level of all opportunities, threats, strengths, and weaknesses after performing the t-test was less than 0.05. Therefore, their significance is confirmed and all cases are considered as internal and external effective in the development of the tourism industry of West Lake. Moreover, they can play an effective role in designing strategies for the development of the tourism industry in the West Lake area.

#### 3.2. Analysis of Internal and External Variables

After identifying the external and internal components of tourism growth in the West Lake, the evaluation matrices of the external factors and internal factors were explored. As is clear in the evaluation matrix of external factors in Table 2, according to the respondents, “increased popularity and internationalization of the West Lake” and “the 2022 Asian Games in Hangzhou are just around the corner” have been introduced as the most important opportunities for the West Lake tourism industry. According to the opinion of the respondents, “tourism supply is insufficient, the target audience is single” has also been introduced as the most important threat to the tourism industry in the region.

As is clear in the evaluation matrix of the internal factors of the development of the tourism industry of West Lake (Table 3), according to the respondents, “superior natural conditions of the area” has been introduced as the most important strength of the West Lake tourism industry. According to the opinion of the respondents, “aging tourism routes” has been introduced as the most important weakness of the tourism industry in the region.

**Table 2.** Evaluation matrix of external factors of tourism development of West Lake.

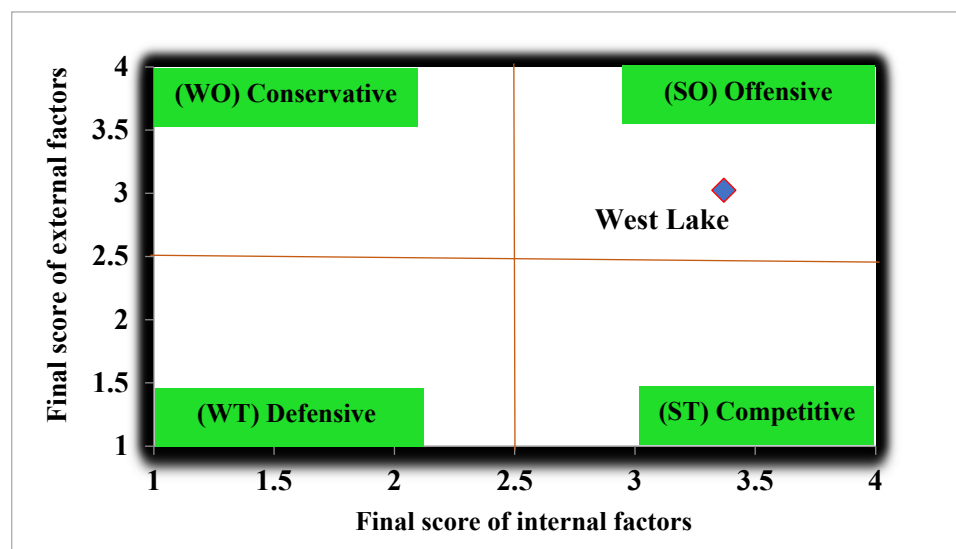
Row	Key External Factors	Importance Factor (from Zero to 1)	Score (from 1 to 4)	Final Score
Opportunities				
1	Increasing the private sector's willingness to participate in tourism-related initiatives and programs	0.082	2.9	0.238
2	Space for guests to utilize the lake and its diverse pools	0.078	2.7	0.211
3	People's desire to maintain and utilize more of the lake's natural and pristine environment	0.076	2.7	0.205
4	Increased popularity and internationalization of the West Lake	0.09	3.5	0.315
5	Increasing travel and recreation motivation among individuals, in the post-epidemic era	0.087	3.1	0.27
6	The 2022 Asian Games in Hangzhou are just around the corner	0.088	3.3	0.29
Threats				
1	Escalating environmental issues attributable to tourism activity	0.085	3.1	0.264
2	Existence of competitive recreational and tourism areas in the vicinity and tourist appeal by other regions	0.078	2.8	0.218
3	Not adhering to health regulations and polluting lake water	0.082	2.9	0.238
4	Improper protection of the lake's historical attractions	0.077	2.7	0.208
5	Excessive visitor traffic and environmental, health, and transportation stresses on popular tourism destinations	0.088	3.1	0.273
6	Tourism supply is insufficient, the target audience is single	0.089	3.3	0.294
Total		1		3.023

**Table 3.** Evaluation matrix of internal factors of tourism development of West Lake.

Row	Key Internal Factors	Importance Factor (from zero to 1)	Score (from 1 to 4)	Final Score
Strengths				
1	Favorable weather with year-round accessibility	0.079	3.3	0.261
2	Existence of diverse tourism amenities on the lake's coasts	0.071	3	0.213
3	The lake's historical and cultural significance	0.073	3.2	0.234
4	Numerous sporting and amusement venues surrounding the lake	0.065	3	0.195
5	It is located in an attractive city with convenient transportation	0.085	3.6	0.306
6	Superior natural conditions of the area	0.089	3.8	0.338
7	The first 5A scenic spot open for free in China	0.082	3.5	0.287
Weaknesses				
1	Absence of adequate frameworks for travelers' optimal use of tourism resources, particularly in natural and protected regions	0.074	3.3	0.244
2	Tourists' disregard for hygiene surrounding the lake	0.071	3.2	0.227
3	Seasonality of tourism demand	0.067	3	0.201
4	The scenery of the West Lake is seasonal	0.081	3.5	0.284
5	Aging tourism routes	0.086	3.7	0.318
6	Congestion at West Lake' popular scenic spots	0.077	3.4	0.262
Total		1		3.369

### 3.3. Developing Strategies with SWOT Model

In this study, the SWOT framework was utilized to construct West Lake tourism strategies. Figure 4 depicts the strategy diagram that was developed based on the factor scores. The final score for the matrix of internal elements was 3.369, while the final score for the matrix of external variables was 3.023, based on the information gathered from the SWOT forms.



**Figure 4.** Diagram of determining strategies based on the final value of internal and external factors in the West Lake analysis.

According to the findings, the best strategic position for the West Lake is in the offensive range, which is centered on internal strengths and external opportunities, and should be based on utilizing the capabilities and potential of the study area.

### 3.4. TOPSIS Model Findings

In this context, TOPSIS, as a decision-making method, is regarded as a straightforward yet effective approach of prioritization. Four groupings of strengths, weaknesses, threats, and opportunities have been ranked using this concept.

Table 4 displays the findings of prioritizing opportunities and threats for the growth of the West Lake tourism business. Table 5 also displays the results of ranking the strengths and weaknesses. Opportunities, strengths, weaknesses, and threats are ranked according to the average expert judgment in Table 6. The resulting alternatives are ranked in Table 7 according to the TOPSIS algorithm.

C values vary from zero to one; the closer C is to one, the greater the priority of the  $i$ th option. The ranking of options according to the value of C varies between 0 and 1. According to this metric,  $C_i = 1$  indicates the best while  $C_i = 0$  indicates the lowest possible rank.

In the West Lake TOPSIS analysis, strengths are rated first, followed by weaknesses, opportunities, and threats. Following is the ranking of the strategies based on the positions of the SWOT and strategy development factors.

Figure 5 indicates that one should first analyze the internal environment, where the strengths are ranked first and the weaknesses are ranked second. In consequence, aggressive (SO) and conservative (WO) tactics are ranked higher than competitive (ST) and defensive (WT) strategies. Consequently, the offensive strategy (SO) ranks first, the competitive strategy (ST) ranks second, the conservative strategy (WO) ranks third, and the defensive strategy (WT) ranks fourth, according to the analysis of the external environment.

**Table 4.** Prioritizing opportunities and threats for the growth of the West Lake tourism business.

Prioritizing Opportunities (O)	Rank	Prioritizing Threats (T)	Rank
Increased popularity and internationalization of the West Lake	1	Tourism supply is insufficient, the target audience is single	1
The 2022 Asian Games in Hangzhou are just around the corner	2	Excessive visitor traffic and environmental, health, and transportation stresses on popular tourist destinations	2
Increasing travel and recreation motivation among individuals in the post-epidemic era	3	Escalating environmental issues attributable to tourism activity	3
Increasing the private sector's willingness to participate in tourism-related initiatives and programs	4	Not adhering to health regulations and polluting lake water	4
Space for guests to utilize the lake and its diverse pools	5	Existence of competitive recreational and tourism areas in the vicinity and tourist appeal of other regions	5
People's desire to maintain and utilize more of the lake's natural and pristine environment	6	Improper protection of the lake's historical attractions	6

**Table 5.** Ranking strengths and weaknesses for the growth of the West Lake tourism business.

Prioritizing Strengths (S)	Rank	Prioritizing Weaknesses (W)	Rank
Superior natural conditions of the area	1	Aging tourism routes	1
It is located in an attractive city with convenient transportation	2	The scenery of the West Lake is seasonal	2
The first 5A scenic spot open for free in China	3	Congestion at West Lake' popular scenic spots	3
Favorable weather with year-round accessibility	4	Absence of adequate frameworks for travelers' optimal use of tourism resources, particularly in natural and protected regions	4
The lake's historical and cultural significance	5	Tourists' disregard for hygiene surrounding the lake	5
Existence of diverse tourism amenities on the lake's coasts	6	Seasonality of tourism demand	6
Numerous sporting and amusement venues surrounding the lake	7	—	—

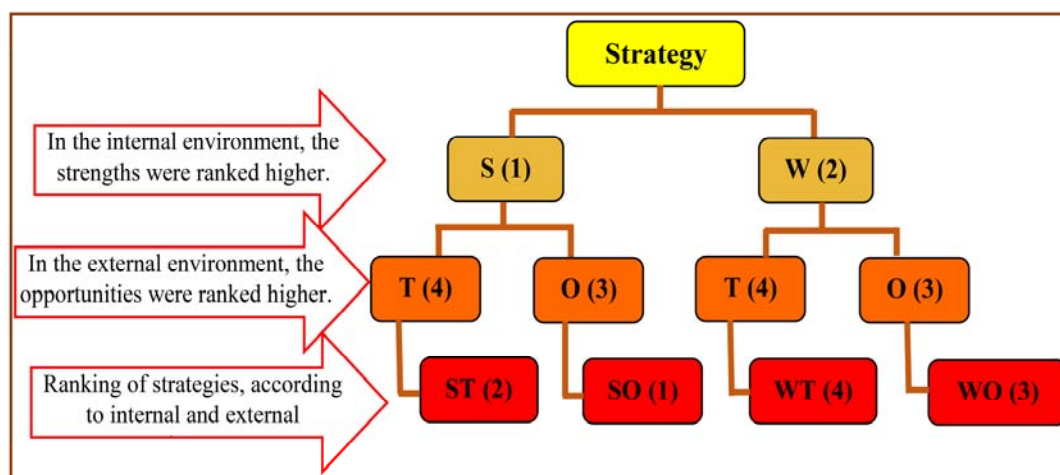
**Table 6.** Average rating of expert judgment.

Row	Internal and External Factors	Experts
1	Threats	0.249
2	Opportunities	0.255
3	Weaknesses	0.256
4	Strengths	0.262

**Table 7.** Ranking of the final alternatives for West Lake based on TOPSIS method.

Threats	Opportunities	Strengths	Weaknesses
C = 0.50	C = 0.52	C = 0.57	C = 0.53





**Figure 5.** Ranking of strategies according to the ranks of four SWOT factors.

### 3.5. Analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT) of the Tourism Industry of West Lake

In this study, the SWOT matrix was utilized to examine threats, opportunities, weaknesses, and strengths in order to promote the West Lake tourism industry (Table 8). This matrix compares internal weaknesses and strengths with external threats and opportunities based on the information gathered in the first stage.

**Table 8.** SWOT matrix for the development of tourism industry of West Lake.

	Strengths (S)	Weaknesses (W)
Opportunities (O)	<p>SO strategies</p> <p>SO<sub>1</sub>. Utilizing the lake's unique location for cross-border tourism development</p> <p>SO<sub>2</sub>. Optimal utilization of the lake's natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues</p> <p>SO<sub>3</sub>. Improving collaboration between relevant groups and authorities to combine the lake's capabilities</p> <p>SO<sub>4</sub>. Planning to use the tourism capacity of the 2022 Asian Games in Hangzhou, due to the superior cultural, historical, and natural features of the lake</p> <p>SO<sub>5</sub>. Emphasis on the promotion of ecotourism given the region's capacity.</p>	<p>WO strategies</p> <p>WO<sub>1</sub>. Review of the integrated management system and selection of a unified management approach to create and promote sustainable tourism objectives</p> <p>WO<sub>2</sub>. Utilizing the capabilities and resources of the private sector to enhance the lake's aging tourism routes</p> <p>WO<sub>3</sub>. Quantitative and qualitative enhancement of service and welfare facilities in accordance with the natural environment of the region</p> <p>WO<sub>4</sub>. Implementation of programs to eliminate poverty and unemployment through local community empowerment and self-assurance.</p>
	<p>ST strategies</p> <p>ST<sub>1</sub>. Determining the ecological tolerance capacity and preventing the overexploitation of the natural environments of the lake by tourists</p> <p>ST<sub>2</sub>. Formulation of strategic plans to maximize potential and opportunities in order to attract tourists in all seasons of the year</p> <p>ST<sub>3</sub>. Establishing winter and summer tourism hubs to attract tourists throughout the year.</p>	<p>WT strategies</p> <p>WT<sub>1</sub>. Developing a strategic environmental plan to manage all sorts of pollution and environmental destruction</p> <p>WT<sub>2</sub>. Educating visitors on how to maximize the lake's capabilities and prevent its contamination</p> <p>WT<sub>3</sub>. Training professionals to introduce the lake's capabilities for tourists.</p>
Threats (T)		

After computing the total scores for each strategy in the quantitative strategic planning matrix of West Lake, the strategies were ranked according to the scores received. On the basis of the internal–external factors matrix in the SWOT model, West Lake should

implement an offensive approach. The examination of the strategic factors of West Lake is summarized in Table 9. The results indicated that the “optimal utilization of the lake’s natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues”, “formulation of strategic plans to maximize potential and opportunities in order to attract tourists in all seasons of the year”, and “planning to use the tourism capacity of the 2022 Asian Games in Hangzhou, due to the superior cultural, historical, and natural features of the lake” strategies were ranked first, second, and third, respectively.

**Table 9.** The results of prioritizing strategic factors in the West Lake.

Row	Strategic Factors	Symbol	Score	Ranking
1	Utilizing the lake’s unique location for cross-border tourism development	SO <sub>1</sub>	0.519	5
2	Optimal utilization of the lake’s natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues	SO <sub>2</sub>	0.583	1
3	Improving collaboration between relevant groups and authorities to combine the lake’s capabilities	SO <sub>3</sub>	0.401	12
4	Planning to use the tourism capacity of the 2022 Asian Games in Hangzhou, due to the superior cultural, historical and natural features of the lake	SO <sub>4</sub>	0.554	3
5	Emphasis on the promotion of ecotourism given the region’s capacity	SO <sub>5</sub>	0.461	9
6	Review of the integrated management system and selection of a unified management approach to create and promote sustainable tourism objectives	WO <sub>1</sub>	0.394	13
7	Utilizing the capabilities and resources of the private sector to enhance the lake’s aging tourism routes	WO <sub>2</sub>	0.548	4
8	Quantitative and qualitative enhancement of service and welfare facilities in accordance with the natural environment of the region	WO <sub>3</sub>	0.479	8
9	Implementation of programs to eliminate poverty and unemployment through local community empowerment and self-assurance	WO <sub>4</sub>	0.412	11
10	Determining the ecological tolerance capacity and preventing the overexploitation of the natural environments of the lake by tourists	ST <sub>1</sub>	0.494	6
11	Formulation of strategic plans to maximize potential and opportunities in order to attract tourists in all seasons of the year	ST <sub>2</sub>	0.571	2
12	Establishing winter and summer tourism hubs to attract tourists throughout the year	ST <sub>3</sub>	0.439	10
13	Developing a strategic environmental plan to manage all sorts of pollution and environmental destruction	WT <sub>1</sub>	0.486	7
14	Educating visitors on how to maximize the lake’s capabilities and preventing its contamination	WT <sub>2</sub>	0.367	15
15	Training professionals to introduce the lake’s capabilities for tourists	WT <sub>3</sub>	0.381	14

#### 4. Discussion

Tourism presents both opportunities and challenges to the natural environment. Ecotourism aims to increase possibilities and decrease threats. If an opportunity is identified, it will result in a profit, whereas a threat that is not avoided will result in a loss. Therefore, ecotourism is not automatically beneficial, as its success is contingent upon careful planning and management. When ecotourism projects are poorly planned or implemented, they become traditional tourism projects with all of their negative repercussions. In this regard, for the development of tourism industry in the West Lake, officials should provide planning methods that take into account the lake’s strengths, weaknesses, opportunities, and threats. Evaluating attitudes of the public, eco-tourists, and other officials is one of the pillars of good planning. Numerous studies have been conducted in the field of prioritizing various aspects of tourism and developing strategies. For instance, Binns and Nel [50],

Petrova et al. [51], Arintoko et al. [52], and Azimovna et al. [53] have offered several tourism development strategies.

West Lake offers numerous opportunities to tourists. To expand the tourism business and protect the lake's ecosystem, adequate planning and management are required. In tourism planning, it is vital to establish the status quo of supply and demand of various uses so that, in addition to sustaining the tourism, the level of demand is also maintained and the region's residents and tourists are satisfied.

Using a SWOT analysis and the TOPSIS method, the tourism potential of the West Lake was analyzed in this study. The West Lake contains numerous natural, historical, and cultural tourism attractions. Identifying and prioritizing strategic tourism programs will play a crucial role in the creation of jobs and economic growth. In this study, in order to establish a strategic plan for the West Lake, the region's plans were analyzed using a combined method of IFE, EFE, and SWOT analytical techniques. Thirteen internal elements and twelve external factors affecting West Lake tourism were identified and evaluated. Additionally, fifteen strategies were presented to improve the lake's tourism.

In addition, the following strategic studies in the sphere of tourism industry development can be mentioned: those of Yan and Wang [27] and Wijaya et al. [54] among similar studies mentioned in the literature review. The execution method and integration of two applied techniques, TOPSIS and SWOT, distinguish this research from others of a similar nature. First, the internal and external elements influencing the development of West Lake tourism were identified using the SWOT approach, and then the strategies were prioritized using the TOPSIS method.

Based on the results of applying the TOPSIS approach to prioritize the lake's strengths, weaknesses, opportunities, and threats, it has been decided that "superior natural conditions of the area" has the highest priority and is the lake's most important strength. Among the list of weaknesses, "aging tourism routes" was given the highest importance and is the lake's most significant weakness. Regarding external opportunities affecting tourism of the lake, priority has been given to "increased popularity and internationalization of the West Lake". In addition, "tourism supply is insufficient, the target audience is single" has been identified as the greatest threat to lake tourism.

Despite the correlations between benchmarks and the fact that benchmarks cannot be considered independent of one another, the TOPSIS technique is the optimal way for integrating criteria when prioritizing strategies in the West Lake. In accordance with the findings of Fahlyiani and Jokar [55], Diaz and Cilinskis [56], and Azimi et al. [57], the TOPSIS technique is frequently applied to the solution of complicated decision-making issues with interdependencies between criteria. Therefore, it can be stated that the TOPSIS method in conjunction with the capabilities of SWOT is a suitable way of prioritizing strategies. Among the many benefits of the TOPSIS model one could mention: quantitative and qualitative criteria can both be incorporated into the review; the output might indicate the precedence of the options; it considers the conflict and desirability of each alternative; initial weighting coefficients are allowed for criteria and indicators; indicators of problem-solving desirability are uniformly increasing or decreasing in desirability.

The objective of the present study was to evaluate West Lake's tourism potential, with the first step consisting of the identification of strategic determinants. In the analysis process, the SWOT analysis resulted in the identification of the strategy for the development of the West Lake tourism industry, on the basis of which an aggressive strategy was chosen. Then, in the second step, based on the conclusion of the TOPSIS technique in order to rank the strengths, weaknesses, threats, and opportunities, and finally rank the strategies, offensive strategies were ranked first. Therefore, it may be stated that the outcomes identified are mutually reinforcing. Consequently, offensive techniques have been outlined in the following sections.

1. Optimal utilization of the lake's natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues.

The culture related to West Lake has a long history, and its long history and profound cultural resources provide rich story themes and character materials for the creation of Chinese cultural and creative products such as film and television, and games including those based on secret rooms and “script killings”. The diversity of cultural and creative products further stimulates the development potential of the IP industry. Generation Z is more inclined to experience consumption and emotional consumption. The estimated number of Generation Z consumers in Hangzhou is 2.2 million, which has become the main force of cultural tourism consumption. In 2021, the number of script-killing businesses in Hangzhou exceeded 315, with a year-on-year growth of 5.72 times. This shows that script-killing has become a common trend among young people. For example, the West Lake Scenic Area can use the “Legend of Lady White” and “Southern Song Dynasty” as the background to set up a play interpretation, so that tourists can better understand the history and culture of the West Lake.

2. Planning to use the tourism capacity of the 2022 Asian Games in Hangzhou, due to the superior cultural, historical, and natural features of the lake.

With the approach of the Asian Games in Hangzhou, it is foreseeable that tourists from all over the world will come to Hangzhou to watch the games. Therefore, for the West Lake Scenic Area located in Hangzhou, it is also a good opportunity to promote the brand of the scenic area. As the West Lake is on the World Heritage List, it is not possible to carry out certain sports events on the waters of the West Lake. However, publicity could be based on the cultural and agricultural landscape as the main theme, supplemented by natural landscape. At the same time, related Asian Games elements could be combined to hold sports horticulture exhibitions, water sports light shows and other activities. The Asian Games is an opportunity to further expand the influence of the West Lake Scenic Area. It should be noted that the 2022 Asian Games were originally scheduled to be held on 10–25 September 2022 in Hangzhou but postponed until 23 September 2023 due to the spread of the COVID-19 virus.

3. Utilizing the lake’s unique location for cross-border tourism development.

In 2020, the Ministry of Culture and Tourism of China issued a document advocating “promoting the construction of night tourism projects and carrying out night tourism events”. Due to the special geographical location of the West Lake, boat sightseeing activities can be carried out. On the other hand, more economic growth could come through differentiated content forms that improved the effectiveness of the West Lake Scenic Area in content marketing: for example, by holding water music festivals, landscape performances, West Lake night cruises and other projects to create popular night tours. Regular lantern fairs, fireworks, light shows and other night festival would assist in meeting emerging consumer demand preferences, while improving supporting facilities, such as theme inns and snack marketing to strengthen consumption.

4. Emphasis on the promotion of ecotourism given the region’s capacity.

West Lake is an urban lake, which is the result of the natural environment and human civilization. Natural resources have been greatly destroyed under the influence of human interference. The ecological tourism of urban lakes needs to be planned and designed with foresight. Urban lake ecotourism should highlight the characteristics of wetland landscape resources, highlight the natural characteristics, and tourism projects that are not harmonious with the lake environment should be avoided. Urban lake ecotourism is different from urban waterfront leisure activities. It not only needs to meet the basic recreational needs of surrounding residents, but also needs to serve the residents of the whole city and even tourists from outside. It needs certain attractive tourism activities, tourism reception facilities, and transportation conditions. Ecological tourism must be based on resource and environment protection in tourist activities, conducted on the basis of sustainability, and pay attention to the environmental security and stability of the development of tourism projects’ design, to wetland protection on the premise of the

realization of goals and functions, and promote environmentally benign development of the West Lake.

5. Improving collaboration between relevant groups and authorities to combine the lake's capabilities.

At present, the task of ecological environmental protection in the West Lake Scenic Area is increasingly onerous and arduous, and the requirements of environmental regulation are increasingly detailed. However, the law enforcement and supervision force at the grassroots level of the scenic area is still weak; the level of intelligent monitoring and monitoring and other "technical defenses" is not high enough. In terms of technology, we can cooperate with Hangzhou universities such as Zhejiang University to seek technical support, help build hardware sensing equipment, and use the information laboratories in universities to accumulate basic data. In terms of water conservancy, we can cooperate with the local hydrological department to conduct real-time monitoring of the water quality and various indicators in the West Lake Scenic Area. The West Lake Scenic Area should actively cooperate with other departments, and use IT to break through information barriers, applying digital governance and intelligence to ecological protection to improve each link, and promote the management of the scenic spot more efficiently, so as to create a model of digital governance.

After identifying the regional tourism industry's development strategies using the TOPSIS approach, the following ranking of these strategies was determined:

1. Optimal utilization of the lake's natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues;
2. Formulation of strategic plans to maximize potential and opportunities in order to attract tourists in all seasons of the year.

The optimization of the strategic plan for West Lake also needs to strengthen the scenic area's ability to execute the strategic plan, focusing on the strategic objectives, planning time, process controls, and result evaluation. First of all, West Lake needs to make it clear that the strategic plan is mainly aimed at increasing business revenue, improving passenger flow, and building the Hangzhou West Lake tourism brand. Therefore, in the development and implementation of strategic plans, the focus should be firmly on producing results, rather than excessive ambition and by setting phased goals, completing the overall strategic objectives. Secondly, the West Lake strategic plan is in line with the marketing plan in the next 3 years. On the one hand, the impact of the novel coronavirus epidemic is still continuing. Although Hangzhou's control efforts are relatively high, there is still a certain expansion risk. Therefore, the strategic plan is phased, a three-year cycle is appropriate, and in improving the tourism infrastructure of West Lake, improving the quality of service is the main work. Third, the West Lake strategic planning process control is also very necessary. Process control is the embodiment of the ability to ensure the realization of the strategic plan. The implementation of the optimized strategic plan will inevitably mean changes, so timely adjustment and improvement of marketing objectives will be needed, and timely follow-up of the completion of each sub-item. Especially, the core product strategy is most critical and by the product content determines the future development space. Finally, the strategic result evaluation of West Lake also needs to be followed up in time. Although the formulation and implementation of the strategic plan are realized in stages, performance management tools such as key performance indicators (KPIs) can be used to implement the whole process, including improved performance and business performance.

3. Planning to use the tourism capacity of the 2022 Asian Games in Hangzhou, due to the superior cultural, historical, and natural features of the lake.
4. Utilizing the capabilities and resources of the private sector to enhance the lake's aging tourism routes.

There are a wide variety of tourist areas in West Lake, but the distance between them is large. According to this distance, one-day tours and two-day tours can be offered. In travelling these distances, cultural attractions are not considered; also the route between



tourist areas is old, which affects the satisfaction of tourists. Therefore, the West Lake Scenic Area should cooperate with the local transportation department to open up the connection between scenic spots in the region. It is not only necessary to connect the old tourist routes in cultural and historical context, but also in geographical location. Therefore, it is suggested that the West Lake Scenic Area should run a special tour bus, stopping at scenic spots, and plan a bus route model according to the traffic data of tourists and reasonable distribution of bus supply.

## 5. Conclusions

As a tourism hub in China, West Lake is interesting to travelers due to its unique natural, cultural, and ancient qualities; nevertheless, these features remain underdeveloped. Earlier, the identification and priority of the West Lake's tourism industry growth were examined. The results indicated that the "optimal utilization of the lake's natural, cultural, and historical potential and attractions in order to develop and attract tourists and generate jobs and revenues" strategy was ranked highest, while the "educating visitors on how to maximize the lake's capabilities and preventing its contamination" strategy was ranked last. Therefore, it is hoped that the relevant authorities would contribute to the expansion and enhancement of the region's economy through a focus on the vision and goals of the tourist sector and careful foresight in the implementation of these projects.

Due to funding and time constraints, this study was done over the course of a few months, and its findings cannot be applied generally. In addition, the processes of strategic planning in this study were based on David's model, and the results may differ from those of other models. Notably, the identified strategic elements were chosen based on the opinions of a subset of experts, and the findings produced may differ based on the opinions of another subset of experts.

Noting that each of the themes stated in this research have numerous dimensions and aspects, it is necessary to conduct extensive research on each of them in order to better comprehend and prepare for the development of tourism. In this regard, the following recommendations are made:

- To use all the potential and natural attractions of the West Lake to develop the tourism industry of the region;
- To take basic measures to attract public and private sector investors in the field of facilities, tourism services, and productive and job-creating activities;
- It is suggested that basic planning be done to prevent excessive pressure from tourists on natural environments;
- Prioritizing development strategies of the West Lake tourism using the Friedman's test.
- It is also suggested to use AHP and BWM methods for factor weighting.
- In order to check uncertainty, evaluations based on fuzzy logic are suggested.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su15032464/s1>. Supplement S1: Evaluation matrix of external factors of tourism development of West Lake.

**Author Contributions:** Conceptualization, Y.Z. and C.C.; methodology, G.Z.; software, Z.L.; validation, S.G.M., E.A. and Y.Z.; formal analysis, E.A.; investigation, G.Z.; resources, Z.L.; data curation, C.C.; writing—original draft preparation, S.G.M.; writing—review and editing, E.A.; visualization, Z.L.; supervision, G.Z.; project administration, Y.Z.; funding acquisition, G.Z. All authors have read and agreed to the published version of the manuscript.

**Funding:** Research Foundation of Hangzhou Dianzi University (KYS335622091; KYH333122029M).

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

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

## References

- Ballantyne, R.; Packer, J.; Hughes, K. Tourists' support for conservation messages and sustainable management practices in wildlife tourism experiences. *Tour. Manag.* **2009**, *30*, 658–664. [\[CrossRef\]](#)
- Kollman, H.; Mitzeaback, R.; Weiskopt, K. Intellected and emotion: Water and geotourism in the elsenwarzen geopark. New challenges with geotourism. In Proceedings of the 8th European Geoparks Conference, Idanha-a-nova, Portugal, 14–18 September 2009; pp. 51–55.
- Wang, Y.-S. The impact of crisis events and macroeconomic activity on Taiwan's international inbound tourism demand. *Tour. Manag.* **2009**, *30*, 75–82. [\[CrossRef\]](#) [\[PubMed\]](#)
- Shugar, D.H.; Jacquemart, M.; Shean, D.; Bhushan, S.; Upadhyay, K.; Sattar, A.; Schwanghart, W.; McBride, S.; de Vries, M.V.W.; Mergili, M.; et al. A massive rock and ice avalanche caused the 2021 disaster at Chamoli, Indian Himalaya. *Science* **2021**, *373*, 300–306. [\[CrossRef\]](#) [\[PubMed\]](#)
- Wijnmalen, D.J. Analysis of benefits, opportunities, costs, and risks (BOCR) with the AHP–ANP: A critical validation. *Math. Comput. Model.* **2017**, *46*, 892–905. [\[CrossRef\]](#)
- Inskeep, E. *Tourism Planning Integrated and Sustainable Development Approach*; John Wiley & Sons: New York, NY, USA, 1991.
- The, L.; Cabanban, A.S. Planning for sustainable tourism in southern PulauBanggi: An assessment of biophysical conditions and their implications for future. *J. Environ. Manag.* **2007**, *85*, 999–1008.
- Chang, H.-H.; Huang, W.-C. Application of a quantification SWOT analytical method. *Math. Comput. Model.* **2006**, *43*, 158–169. [\[CrossRef\]](#)
- Hong, C.W.; Chan, N.W. Strength-Weakness-Opportunities-Threats Analysis of Penang National Park for Strategic Ecotourism Management. *World Appl. Sci. J.* **2010**, *10*, 136–145.
- Kumari, S.; Behera, M.D.; Tewari, H.R. Identification of potential ecotourism sites in West District, Sikkim using geospatial tools. *Trop. Ecol.* **2010**, *51*, 75–85.
- Reihanian, A.; Mahmood, N.Z.B.; Kahrom, E.; Hin, T.W. Sustainable tourism development strategy by SWOT analysis: Boujagh National Park, Iran. *Tour. Manag. Perspect.* **2012**, *4*, 223–228. [\[CrossRef\]](#)
- Ervural, B.C.; Zaim, S.; Demirel, O.F.; Aydin, Z.; Delen, D. An ANP and fuzzy TOPSIS-based SWOT analysis for Turkey's energy planning. *Renew. Sustain. Energy Rev.* **2018**, *82*, 1538–1550. [\[CrossRef\]](#)
- Papapostolou, A.; Karakosta, C.; Apostolidis, G.; Doukas, H. An AHP-SWOT-Fuzzy TOPSIS Approach for Achieving a Cross-Border RES Cooperation. *Sustainability* **2020**, *12*, 2886. [\[CrossRef\]](#)
- Solangi, Y.A.; Tan, Q.; Mirjat, N.H.; Ali, S. Evaluating the strategies for sustainable energy planning in Pakistan: An integrated SWOT-AHP and Fuzzy-TOPSIS approach. *J. Clean. Prod.* **2019**, *236*, 117655. [\[CrossRef\]](#)
- Falcone, P.M. Tourism-Based Circular Economy in Salento (South Italy): A SWOT-ANP Analysis. *Soc. Sci.* **2019**, *8*, 216. [\[CrossRef\]](#)
- Anser, M.K.; Mohsin, M.; Abbas, Q.; Chaudhry, I.S. Assessing the integration of solar power projects: SWOT-based AHP–F-TOPSIS case study of Turkey. *Environ. Sci. Pollut. Res.* **2020**, *27*, 31737–31749. [\[CrossRef\]](#)
- Büyükoçkan, G.; Mukul, E.; Kongar, E. Health tourism strategy selection via SWOT analysis and integrated hesitant fuzzy linguistic AHP-MABAC approach. *Socio Econ. Plan. Sci.* **2021**, *74*, 100929. [\[CrossRef\]](#)
- Bivriani, H.; Ghofran, A. Explaining and Applying TOPSIS Multi-Criteria Decision Model for Ranking Urban Areas in terms of Crime and Delinquency. *J. Detect. Second. Term* **2009**, *2*, 131–150.
- Gorman, C.E. Land landscape and geotourism: Market typologies and visitor needs. In *Conference: Promotion and Protection, Achieving the Balance*; School of Hospitality Management and Tourism; Dublin Institute of Technology: Dublin, Ireland, 2007; pp. 101–102.
- Jablonska, J.; Timkak, G.; Pixova, D. Geotourism and water quality of river Hornad. *Acta Montan. Slovaca* **2009**, *14*, 213–220.
- Zouros, N.C. Geotourism development in the Lesvos petrified forest geopark. In Proceedings of the 8th European Geoparks Conference, Idanha-a-nova, Portugal, 14–18 September 2009; Volume 8, pp. 93–97.
- Farsani, N.T.; Coelho, C.; Costa, C. Geotourism and geoparks as novel strategies for socio-economic. *Int. J. Tour. Res.* **2011**, *13*, 68–81. [\[CrossRef\]](#)
- Chunterawong, P. Interactive Communication Design to Enhance Tourists' Traveling Experiences in Chiang Rai. *Commun. Media Asia Pac. (CMAP)* **2019**, *2*, 73–92.
- Bas, E. The integrated framework for analysis of electricity supply chain using an integrated SWOT-fuzzy TOPSIS methodology combined with AHP: The case of Turkey. *Int. J. Electr. Power Energy Syst.* **2013**, *44*, 897–907. [\[CrossRef\]](#)
- Karoubi, M.; Ahmadi, S. Strategic planning of medical tourism using the SWOT Matrix-Fuzzy TOPSIS Technique. *Tour. Manag. Stud.* **2020**, *15*, 1–30. [\[CrossRef\]](#)
- Dachyar, A.Z.N.S.M.; Sahir, A. Hotel revival strategy planning with SWOT-Fuzzy AHP-TOPSIS: A case study of 4-star hotel. In Proceedings of the 11th Annual International Conference on Industrial Engineering and Operations Management, Singapore, 7–11 March 2020.
- Yan, Z.; Wang, X. Research on the Tourism Development and Countermeasures of Nishan Town—Based on SWOT Analysis. *J. Serv. Sci. Manag.* **2021**, *14*, 429–443. [\[CrossRef\]](#)
- Swangjang, K.; Kornpiphat, P. Does ecotourism in a Mangrove area at Klong Kone, Thailand, conform to sustainable tourism? A case study using SWOT and DPSIR. *Environ. Dev. Sustain.* **2021**, *23*, 15960–15985. [\[CrossRef\]](#) [\[PubMed\]](#)
- Ghorbani, A.; Raufirad, V.; Rafiaani, P.; Azadi, H. Ecotourism sustainable development strategies using SWOT and QSPM model: A case study of KajiNamakzar Wetland, South Khorasan Province, Iran. *Tour. Manag. Perspect.* **2015**, *16*, 290–297. [\[CrossRef\]](#)

30. Yazdani, S.; Hosseini, F.; Ahmady, S. System based practice: A concept analysis. *J. Adv. Med Educ. Prof.* **2016**, *4*, 45–53.
31. García-Melón, M.; Gómez-Navarro, T.; Acuña-Dutra, S. An ANP Approach to Assess the Sustainability of Tourist Strategies for the Coastal NP of Venezuela. In Proceedings of the 5th International Vilnius conference, Vilnius, Lithuania, 25–27 June 2009; pp. 235–240.
32. Aminu, M.; Matori, A.N.; Yusof, K.W.; Zainol, R.B. Application of Geographic Information System (GIS) and Analytic Network Process (ANP) for sustainable tourism planning in Cameron Highlands, Malaysia. *Mech. Mater.* **2014**, *567*, 769–774. [\[CrossRef\]](#)
33. Marlina, E. Geotourism as a Strategy of Geosite Empowerment Towards the Tourism Sustainability in Gunungkidul Regency, Indonesia. *Int. J. Smart Home* **2016**, *10*, 131–148.
34. Arsić, S.; Nikolić, D.; Živković, Ž. Hybrid SWOT-ANP-FANP model for prioritization strategies of sustainable development of ecotourism in National Park Djerdap, Serbia. *For. Policy Econ.* **2017**, *80*, 11–26. [\[CrossRef\]](#)
35. Herrera, G.; Carrión, P.; Briones, J. Geotourism Potential in the Context of the Geopark Project for the Development of Santa Elena Province, Ecuador. *WIT Trans. Ecol. Environ.* **2018**, *217*, 557–568. [\[CrossRef\]](#)
36. Tzeng, G.-H.; Huang, J.-J. *Multiple Attribute Decision Making: Methods and Applications*, 1st ed.; Chapman and Hall/CRC: New York, NY, USA, 2011; 352p. [\[CrossRef\]](#)
37. Li, Z.; Yang, T.; Huang, C.S.; Xu, C.Y.; Shao, Q.; Shi, P.; Wang, X.; Cui, T. An improved approach for water quality evaluation: TOPSIS-based informative weighting and ranking (TIWR) approach. *Ecol. Ind.* **2018**, *89*, 356–364. [\[CrossRef\]](#)
38. Hwang, C.L.; Yoon, K. Methods for multiple attribute decision making. In *Multiple Attribute Decision Making: Methods and Applications a State-of-the-Art Survey*; Springer: Berlin/Heidelberg, Germany, 1981; pp. 58–191.
39. Pourebrahim, S.; Hadipour, M.; Bin Mokhtar, M.; Taghavi, S. Application of VIKOR and fuzzy AHP for conservation priority assessment in coastal areas: Case of Khuzestan district, Iran. *Ocean. Coast. Manag.* **2014**, *98*, 20–26. [\[CrossRef\]](#)
40. Alvandi, E.; Soleimani-Sardo, M.; Meshram, S.G.; Giglou, B.F.; Ghaleno, M.R.D. Using Improved TOPSIS and Best Worst Method in prioritizing management scenarios for the watershed management in arid and semi-arid environments. *SoftComput.* **2021**, *25*, 11363–11375. [\[CrossRef\]](#)
41. Meshram, S.G.; Alvandi, E.; Meshram, C.; Kahya, E.; Al-Quraishi, A.M. Application of SAW and TOPSIS in prioritizing watersheds. *Water Resour. Manag.* **2020**, *34*, 715–732. [\[CrossRef\]](#)
42. Yang, T.; Zhang, Q.; Wan, X.; Li, X.; Wang, Y.; Wang, W. Comprehensive ecological risk assessment for semi-arid basin based on conceptual model of risk response and improved TOPSIS model—a case study of Wei River Basin, China. *Sci. Total Environ.* **2020**, *719*, 137502. [\[CrossRef\]](#)
43. Bognár, F.; Szentés, B.; Benedek, P. Development of the PRISM Risk Assessment Method Based on a Multiple AHP-TOPSIS Approach. *Risks* **2022**, *10*, 213. [\[CrossRef\]](#)
44. Khazaei, M.; Hamzeh, S.; Samani, N.N.; Muhuri, A.; Goita, K.; Weng, Q. A web-based system for satellite-based high-resolution global soil moisture maps. *Comput. Geosci.* **2023**, *170*, 105250. [\[CrossRef\]](#)
45. Tullis, T.S.; Stetson, J.N. A comparison of questionnaires for assessing website usability. *UPA Present.* **2004**, *1*, 1–12.
46. Brooke, J. SUS: A 'Quick and Dirty' Usability Scale. *Usability Eval. Ind.* **1996**, *189*, 4–7.
47. Wright, P.L.; Kroll, M.J.; Parnell, J.A. *Strategic Management: Concepts and Cases*; Prentice Hall: Hoboken, NJ, USA, 1998.
48. World Tourism Organization. *A Practical Guide to Tourism Destination Management*; World Tourism Organization: Madrid, Spain, 2007.
49. Ghaleno, M.R.D.; Meshram, S.G.; Alvandi, E. Pragmatic approach for prioritization of flood and sedimentation hazard potential of watersheds. *Soft Comput.* **2020**, *24*, 15701–15714. [\[CrossRef\]](#)
50. Binns, T.; Nel, E. Tourism as a local development strategy in South Africa. *Geogr. J.* **2002**, *168*, 235–247. [\[CrossRef\]](#)
51. Petrova, M.; Dekhtyar, N.; Klok, O.; Loseva, O. Regional tourism infrastructure development in the state strategies. *Probl. Perspect. Manag.* **2018**, *16*, 259–274. [\[CrossRef\]](#)
52. Arintoko, A.; Ahmad, A.A.; Gunawan, D.S.; Supadi, S. Community-based tourism village development strategies: A case of Borobudur tourism village area, Indonesia. *Geo J. Tour. Geosites* **2020**, *29*, 398–413. [\[CrossRef\]](#)
53. Azimovna, M.S.; Ilkhomovna, U.D.; Shokhrukhovich, U.F. Innovative Strategies of Tourism Development in Uzbekistan. *Eur. J. Innov. Nonform. Educ.* **2022**, *2*, 1–4.
54. Wijaya, P.Y.; Kawiana, I.G.P.; Suasih, N.N.R.; Hartati, P.S.; Sumadi, N.K. SWOT and MICMAC analysis to determine the development strategy and sustainability of the Bongkasa Pertiwi Tourism Village, Bali Province, Indonesia. *Decis. Sci. Lett.* **2020**, *9*, 439–452. [\[CrossRef\]](#)
55. Fahlyiani, M.A.; Jokar, S. Codification appropriate strategies urban land using a combined model TOPSIS-SWOT. *Geogr. Hum. Relatsh.* **2019**, *2*, 349–368.
56. Diaz, F.; Cilinskis, E. Use of Multi-Criteria TOPSIS Analysis to Define a Decarbonization Path in Colombia. *RigasTeh. Univ. Zinat. Raksti* **2019**, *23*, 110–128. [\[CrossRef\]](#)
57. Azimi, R.; Yazdani-Chamzini, A.; Fouladgar, M.M.; Zavadskas, E.K.; Basiri, M.H. Ranking the strategies of mining sector through ANP and TOPSIS in a SWOT framework. *J. Bus. Econ. Manag.* **2011**, *12*, 670–689. [\[CrossRef\]](#)

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.