

Research Article

Evaluation Method of Ecological Tourism Carrying Capacity of Popular Scenic Spots Based on Set Pair Analysis Method

Xiangrong Yan 

Wuhan Technical College of Communications, Wuhan 430065, China

Correspondence should be addressed to Xiangrong Yan; yanxiangrong1964@163.com

Received 18 February 2022; Revised 15 March 2022; Accepted 31 March 2022; Published 5 May 2022

Academic Editor: Sang-Bing Tsai

Copyright © 2022 Xiangrong Yan. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

By making adaptive adjustments to the tourism activities and tourism structure carried out in the tourist area, the natural resources of the scenic area can be protected while pursuing economies of scale. Moreover, it achieves a benign interaction between scenic spot development, planning, carrying capacity, and benefits, so that the scenic spot can develop sustainably under the condition of grasping the carrying capacity and restrictive conditions. This paper combines the set pair analysis method to evaluate the ecological tourism carrying capacity of scenic spots, so as to improve the quantitative effect of ecological tourism carrying capacity of scenic spots. In addition, this paper introduces the fuzzy analytic hierarchy process to determine the weight of the evaluation indicators and combines the set pair analysis method to establish a comprehensive evaluation model. The research results show that the evaluation method of ecotourism carrying capacity of popular scenic spots based on set pair analysis proposed in this paper has a good effect.

1. Introduction

Examining the carrying capacity of tourism environment from the perspective of stakeholder theory can promote the cross-integration of different disciplines such as management, tourism science, and environmental science. Studying tourism issues from the perspective of management theory objectively involves the cross-integration of a variety of disciplines. For example, management experts believe that [1] tourist attractions should consciously strengthen the awareness of marketing services, expand the tourist attraction of scenic spots, and enhance the awareness of tourism services, so that more tourists can experience beautiful natural scenery and high-quality tourism services. The tourism environment researchers believe that [2, 3] the carrying capacity of the scenic environment and the impact of foreign tourism culture on local traditional cultural values, customs, ideology, and natural resources should be considered while developing tourism. At the same time, while attracting foreign tourists, we should pay attention to the protection of the cultural traditions of the local residents in the scenic area, avoid the impact of foreign culture on the

local culture, and pay more attention to the protection of the ecological environment and natural resources. Therefore, the cross-study of different disciplines will find some new theories and new viewpoints, and the fusion of many theories and viewpoints can create a new knowledge system. This avoids single theoretical research from falling into a loop and falling into a one-sided research paradigm and enriches and improves the knowledge system of tourism-related disciplines [3].

Environmental damage and cultural conflicts brought about by tourism are getting bigger and bigger. “Smoke-free industry” faces the embarrassment of “smoke.” While developing the tourism industry, some countries only pursue the speed of development without paying attention to the negative effects brought by the tourism industry. They resort to excessive or even predatory exploitation of natural resources such as tourist attractions, blind construction of tourist facilities, and extensive use of scenic spots. At the same time, the influx of tourists into the scenic spot poses a challenge to the environmental carrying capacity of the scenic spot. Many tourist scenic spots have a series of problems such as ecosystem destruction, environmental

pollution, and the decline of traditional culture and the normal life of residents in the scenic spots.

Tourism and leisure have become the first choice for people to go out and play. Tourism in various places has developed rapidly. The rapid development of tourism has attracted a large number of tourists to gather in tourist destinations within a certain period of time. The density of tourists has increased significantly, exceeding local tourism. The environmental capacity brings problems such as environmental pollution, resource shortage, and traffic congestion to the tourist destination and seriously damages the local tourism ecological environment. During the peak tourist season, it is necessary to control the number of tourists, reduce the pressure on the environmental capacity of the tourist destination, and keep the tourist density within a reasonable range so that the ecological environment carrying capacity of the tourist destination and the sense of tourist experience will not decline.

This paper combines the set pair analysis method to evaluate the ecological tourism carrying capacity of scenic spots, improve the quantitative effect of ecological tourism carrying capacity of scenic spots, and provide theoretical reference for the follow-up sustainable development of tourist scenic spots.

2. Related Work

Wee et al. [4] believe that the tourist experience of tourists has not reached the best state, so it is necessary to study the carrying capacity of the tourism environment, limit a certain number of tourists, and develop tourism within the range allowed by the tourism environment, so that most tourists get a good travel experience. Lepage only conducted basic research on the carrying capacity of tourism environment but did not conduct in-depth research. From the perspective of classification of biophysical capacity, social and cultural capacity, psychological capacity, management capacity, and so on, Do et al. [5] proposed that the tourism environment capacity is within a certain time and a certain space range, and tourists can obtain a good tourism experience without destroying it. The activity intensity is improved that the tourism environment can bear under the condition that tourists can obtain a good tourism experience and do not damage the environment. Mykola et al. [6] believe that the tourism environment capacity is the level of tourists that the tourism resources of a certain area can accept under the condition that they are not destroyed. Simanjuntak and Rumondang Banjarnahor [7] mainly used observational experiments, icon analysis, case analysis, and other methods to study the carrying capacity of tourism environment. Tourism has become a frequent recreational activity for residents, and the environmental problems caused by tourism have become more and more prominent. As a result, the research on the carrying capacity of tourism environment has once again become the tipping point of research [8]. Trang et al. [9] believe that the carrying capacity of the tourism environment is the quality of resources that the natural environment can accept without being damaged to an unacceptable degree.

Kongbuamai et al. [10] made a brand-new attempt to the concept of tourism environmental capacity and the method of calculating capacity and creatively used the multifactor analysis method to determine the tourism environmental capacity. Kisiel et al. [11] made an in-depth theoretical discussion and proposed that the tourism environment capacity should include two aspects: one is the natural environment capacity, and the other is the sensing environment capacity, that is, the capacity to accommodate tourists on the basis of ensuring a good tourism experience for tourists. On the basis of theoretical analysis, quantitative research is also made, and improvement measures are proposed from both macro and microaspects. Rahmawati et al. [12] divided the tourism environment capacity into two categories: basic tourism environment capacity and non-basic tourism environment capacity. Milla et al. [13] determined the connotation of tourism environmental carrying capacity and established the definition of tourism environmental carrying capacity. It is believed that tourism environmental carrying capacity should include four indicators: natural environment carrying capacity, resource space carrying capacity, economic carrying capacity, and psychological carrying capacity. Rahmawati et al. [14] proposed that nature reserves should pay attention to both ecological protection and resource development and should take a sustainable development path. Dzhandzhugazova et al. [15] focused on the early warning system of the environmental carrying capacity of tourist attractions, proposed that the environmental early warning system of scenic spots should include a weight module, an indicator module, a prediction module, and a warning area module, and analyzed the application of each module in the early warning system. Scenic spots should establish an early warning system for the environmental carrying capacity of tourist attractions according to the number of tourists they receive. Adamchuk [16] established a quantitative evaluation model for the comprehensive carrying capacity of scenic spots based on the product matrix vector length method and obtained a favorable measure of the comprehensive carrying capacity of scenic spots. Cvijanović et al. [17] constructed the measurement formulas of ecotourism environment capacity, natural resource environment capacity, tourism space environment capacity, social ecotourism environment capacity, and tourist ecotourism environment capacity by using the theoretical speculation method and empirical measurement method. Mohanty et al. [18] analyzed the cumulative effect of tourism activities on environmental capacity and established a formula for calculating tourism environmental capacity by using the quantitative relationship between environmental factors and Pareto optimality. Kalchenko et al. [19] proposed a tourism environmental carrying capacity measurement model with length, area, and recreational facilities as limiting factors and measured the environmental carrying capacity through the design of the model.

3. Set Pair Analysis Method

It analyzes and studies the relationship and transformation between objective things from the three aspects of similarities, differences, and opposites and uses the degree of

connection to describe the various uncertainties of the system, thereby transforming the dialectical understanding of uncertainty into a mathematical tool for quantitative analysis.

We give sets A and B and set the set pair composed of these two sets to be denoted as $H = (A, B)$. On the background of a specific problem, the characteristics of the set pair H are analyzed, and the connection degree expression of the two sets is established.

$$\mu_{(A,B)} = \frac{S}{N} + \frac{F}{N}i + \frac{P}{N}j. \quad (1)$$

Then, formula (1) can be rewritten as

$$\mu_{(A,B)} = a + bi + cj. \quad (2)$$

Formula (2) should satisfy the normalization condition:

$$a + b + c = 1. \quad (3)$$

In formulas (1) and (2), i is the difference degree coefficient; j is the opposite degree coefficient. i and j have dual meanings. The first implication is that i and j are used as coefficients for the degree of difference and the degree of oppositeness, respectively. The second meaning is that the values of i and j are not taken into account, and it only acts as a marker at this time. The highest level of connection is the tourism resource carrying capacity level of the evaluated city. The set composed of the index values of the evaluated city is A, the set composed of the corresponding level I standard index values is B1, the set composed of the corresponding level II standard index values is B2, and the set composed of the corresponding level III standard index values is B3. If $\mu_{(A,B_1)} > \mu_{(A,B_2)} > \mu_{(A,B_3)}$, the tourism resource carrying capacity of the evaluated city belongs to level I. Therefore, the determination of the degree of connection is the key to the analysis of the set pair.

From the definition of connection degree, it can be known that a , b , and c in formula (2) are determined by the similarities and differences of the set pairs. Therefore, in practical applications, attention should be paid to the definition of the criteria for the discrimination of the same, the different, and the opposite. In the evaluation problem studied in this section, the criterion for the identification of similarities, differences, and opposites is as follows: when the evaluation indicators are within the discussed level range, they are considered to be the same. When the evaluation indicators are in separate standard levels, they are considered to be opposites. When the evaluation index is in the adjacent standard level, it is considered to be different.

It is easy to obtain from the definition and criterion of connection degree:

$$\mu_{(A,B_1)} = \frac{S_1}{N} + \frac{F_1}{N}i + \frac{P_1}{N}j, \quad (4)$$

where N is the total number of evaluation indicators, S is the number of indicators whose index value is within the level I standard, F is the number of indicators whose index value is within the level II standard, and P is the number of indicators whose index value is within the level III standard. Similarly, the expression for $\mu_{(A,B_2)}$, $\mu_{(A,B_3)}$ can be obtained.

Definition 1. The object is taken as the domain of discourse, denoted as X. The membership degrees of A and A are:

$$\mu_A(x) = a + c, \mu_{A^c}(x) = b. \quad (5)$$

The two are, respectively, called the deterministic degree of membership (referred to as the degree of certainty) and the degree of uncertainty membership (referred to as the degree of difference). According to the definition of fuzzy complement, there are

$$\mu_A(x) + \mu_{A^c}(x) = 1. \quad (6)$$

Definition 2. Deterministic information is a domain, which is denoted by Y. The fuzzy subset B^c in Y is defined as identity information and opposite information, respectively. Then, the membership degree of the extracted information x about B^c is

$$\mu_A(x) = a, \mu_{A^c}(x) = c. \quad (7)$$

They are, respectively, called the same degree of membership (referred to as the same degree) and the opposite degree of membership (referred to as the opposite degree).

Therefore, formula (2) becomes the deterministic and uncertain fuzzy structure function formula in the information sense, which gives the fuzzy description of the same, different, and antithetical set pairs on a certain characteristic. Therefore, it is called the fuzzy connection degree expression of set pair. The expression of fuzzy connection degree can conceptually describe the uncertainty of objective objects and subjective cognition relatively completely and can describe various uncertainty problems extensively and deeply.

We use the determination of the difference degree coefficient i in $\mu_{(A,B_1)} = S_1/N + F_1/Ni + P_1/Nj$ as an example to further illustrate its value method. The value of a certain index in the class I standard is x , $x \in [S_{(1)}, S_{(2)}]$, and $S_{(1)}$ and $S_{(2)}$ are the limit values of the class I and class II standards of the index. The proximity of x to $S_{(1)}$ is $S_{(1)}/x$, and the proximity of x to $S_{(2)}$ is $x/S_{(2)}$. When $x = S_{(1)}$ or $x = S_{(2)}$, $S_{(1)}/x + x/S_{(2)}$ takes the maximum value of $1 + S_{(1)}/S_{(2)}$. The two can be regarded as the affirmation and negation of the closeness of x to its level I standard, that is, the degree of identity and opposition of the set pair (x, b_1) . Then, there is

$$a = \frac{S_{(1)}S_{(2)}}{(S_{(1)} + S_{(2)})x}, c = \frac{x}{S_{(1)} + S_{(2)}}. \quad (8)$$

Since $a+b+c=1$, the difference can be obtained as

$$b = 1 - a - c = 1 - \frac{S_{(1)}S_{(2)}}{(S_{(1)} + S_{(2)})x} - \frac{x}{S_{(1)} + S_{(2)}} \quad (9)$$

$$= \frac{(S_{(2)} - x)(x - S_{(1)})}{(S_{(1)} + S_{(2)})x}$$

From this, we can get

$$\begin{aligned} \mu_{(x,b_1)} &= \frac{S_{(1)}S_{(2)}}{(S_{(1)} + S_{(2)})x} \\ &+ \frac{(S_{(2)} - x)(x - S_{(1)})}{(S_{(1)} + S_{(2)})x} i \\ &+ \frac{x}{S_{(1)} + S_{(2)}} j. \end{aligned} \tag{10}$$

The value process of the difference coefficient i is also the decomposition process. By substituting the value of i into the expression for $\mu_{(A,B_1)}$, we get

$$\begin{aligned} \mu_{(A,B_1)} &= \left(\frac{S_1}{N} + \frac{F_1}{N} \times \frac{S_{(1)}S_{(2)}}{(S_{(1)} + S_{(2)})x} \right) \\ &+ \frac{F_1}{N} \times \frac{(S_{(2)} - x)(x - S_{(1)})}{(S_{(1)} + S_{(2)})x} i \\ &+ \left(\frac{F_1}{N} \times \frac{x}{S_{(1)} + S_{(2)}} + \frac{P_1}{N} \right) j. \end{aligned} \tag{11}$$

Comparing formulas (4) and (11), it can be seen that the value process of i is a further analysis process of uncertainty. It is a process of in-depth understanding of the system, which can obtain more effective information and make the evaluation results more accurate and reliable. The final i value can take the average value of the corresponding items of the n i values.

The key link of the AHP method is to establish a judgment matrix, and whether the judgment matrix is scientific and reasonable directly affects the effect of the AHP method. Through analysis, it is found that there are the following problems:

- (1) It is very difficult to test whether the judgment matrix is consistent.

To check whether the judgment matrix is consistent, it is necessary to find the maximum characteristic root λ_{\max} of the judgment matrix and judge whether λ_{\max} is equal to the order n of the judgment matrix. If $\lambda_{\max} = n$ is consistent, when the order n is large, the workload of calculating λ_{\max} accurately is very large.

- (2) When the judgment matrix is not consistent, it is necessary to adjust the elements of the judgment matrix to make it consistent. This does not rule out that the judgment matrix can be made consistent after several times of adjustment, inspection, readjustment, and reinspection.
- (3) The consistency of judgment matrix is significantly different from that of human thinking.

In order to solve the above problems, Yao Min et al. introduced the concept of fuzzy consistent matrix, improved AHP, and proposed a fuzzy analytic hierarchy process (FAHP) based on fuzzy induced matrix. The research on this method has achieved certain results.

Then, its connection degree expression is

$$\mu(A, B_1) = \sum_{i=1}^s u_i + \sum_{k=1}^f t_k i_k + \sum_{j=1}^p v_j j, \tag{12}$$

where i_k represents the difference coefficient between sets A and B1 reflected on the index with the weight of sample set A. Similarly, the expression for $\mu_{(A,B_2)}, \mu_{(A,B_3)}$ can be obtained.

Step 4. Determination of the difference degree coefficient i_k in the connection degree expression.

We take the value of i in the expression $\mu_{(A,B_1)}$ as an example and set a certain index whose value of the sample index is within the range of level II standard as x_k and $S_{(1)}^k, S_{(2)}^k$ as the limit of level I and II of the index. Then, according to the point of view of fuzzy connection degree, to determine the value of the difference degree coefficient c is to determine the similarity, difference, and anti-fuzzy connection degree between x_k and the index level I standard post, which is expressed as $\mu_{(x_k, b_1^k)} = a + bi + cj$, that is, the values of i_k are a_k, b_k, c_k , respectively. Among them, a_k is the same degree, b_k is the difference degree, and c_k is the opposite degree. The fuzzy connection degree between x_k and its class I standard b_1^k is determined from the closeness characteristic, the closeness between x_k and $S_{(1)}^k$ is $S_{(1)}^k/x_k$, and the closeness between x_k and $S_{(2)}^k$ is $x_k/S_{(2)}^k$. When $x = S_{(1)}$ or $x = S_{(2)}$, $S_{(1)}/x + x/S_{(2)}$ takes the maximum value of $1 + S_{(1)}/S_{(2)}$. The two can be regarded as the affirmation and negation of the closeness of x to its level I standard, that is, the degree of identity and opposition of the set pair (x, b_1) . Then, there is

$$\begin{aligned} a_k &= \frac{S_{(1)}^k S_{(2)}^k}{(S_{(1)}^k + S_{(2)}^k)x_k}, \\ c &= \frac{x_k}{S_{(1)}^k + S_{(2)}^k}. \end{aligned} \tag{13}$$

Because $a_k + b_k + c_k = 1$, the degree of difference can be obtained as

$$\begin{aligned} b_k &= 1 - a_k - c_k = 1 - \frac{S_{(1)}^k S_{(2)}^k}{(S_{(1)}^k + S_{(2)}^k)x_k} - \frac{x_k}{S_{(1)}^k + S_{(2)}^k} \\ &= \frac{(S_{(2)}^k - x_k)(x - S_{(1)}^k)}{(S_{(1)}^k + S_{(2)}^k)x_k}. \end{aligned} \tag{14}$$

From this, we can get

$$\begin{aligned} \mu_{(x_k, b_1^k)} &= a_k + b_k i + c_k j = \frac{S_{(1)}^k S_{(2)}^k}{(S_{(1)}^k + S_{(2)}^k)x_k} \\ &+ \frac{(S_{(2)}^k - x_k)(x - S_{(1)}^k)}{(S_{(1)}^k + S_{(2)}^k)x_k} i + \frac{x_k}{S_{(1)}^k + S_{(2)}^k} j. \end{aligned} \tag{15}$$

It can be seen that the value process of the difference degree coefficient i_k is the decomposition process of the difference degree of sets A and B reflected on the index x_k with the weight t_k .

Step 5. Calculate the value of the connection degree.

By taking $\mu(A, B_1)$ as an example and substituting the values of i_k into formula (15), respectively, we get

$$\begin{aligned} \mu(A, B_1) &= \sum_{i=1}^s u_i + \sum_{k=1}^f t_k (a_k + b_k i + c_k j) + \sum_{i=1}^P v_i j \\ &= \left(\sum_{i=1}^s u_i + \sum_{k=1}^f t_k a_k \right) + \sum_{k=1}^f t_k b_k i \\ &\quad + \left(\sum_{k=1}^f t_k c_k + \sum_{i=1}^P v_i \right) j. \end{aligned} \tag{16}$$

At this time, $i = 0, j = -1$ in formula (16). This method of value selection reflects that on the basis of fully mining the information contained in the evaluation samples.

Step 6. The grade of the evaluation sample is determined by comparing the value of the degree of connection between the evaluation sample index value set and each evaluation grade standard index value set. The grade with a larger connection degree value is the water quality grade of the evaluation sample. By determining the grade of the evaluation sample A as an example, if $\mu_{(A, B_1)} > \mu_{(A, B_2)} > \mu_{(A, B_3)}$, the grade of the evaluation sample A is grade I.

4. Evaluation System of Ecotourism Carrying Capacity of Popular Scenic Spots

The environmental carrying capacity of ecotourism is that with the rise of ecotourism in the world, the sustainable development of tourism is emphasized on the basis of the carrying capacity of the tourism environment, that is, the intensity of tourism activities. It does not damage the present and future generations and also emphasizes the continuity and fairness of the intensity of tourism activities between human generations. Figure 1 shows the relationship between the carrying capacity of ecotourism, the carrying capacity of the tourism environment, and the capacity of the tourism environment.

There is a correlation between the ecological environment of a tourist destination and its surrounding stakeholders, and a large number of stakeholders are gathered around the tourist destination. These stakeholders directly or indirectly related to the scenic spot are divided into three levels: core stakeholders, strategic stakeholders, and peripheral stakeholders, as shown in Figure 2.

The factors involved in tourist attractions are intertwined and complex. In the process of determining the index system process, the availability, operability, and statisticability of the index must be fully considered, and the index system constructed can objectively reflect its impact on the bearing capacity. Therefore, the construction of the tourism

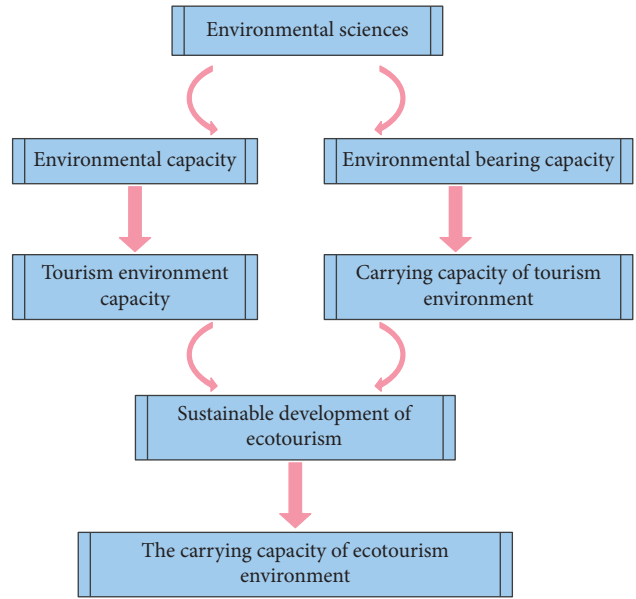


FIGURE 1: The relationship between the carrying capacity of ecotourism, the carrying capacity of the tourism environment, and the capacity of the tourism environment.

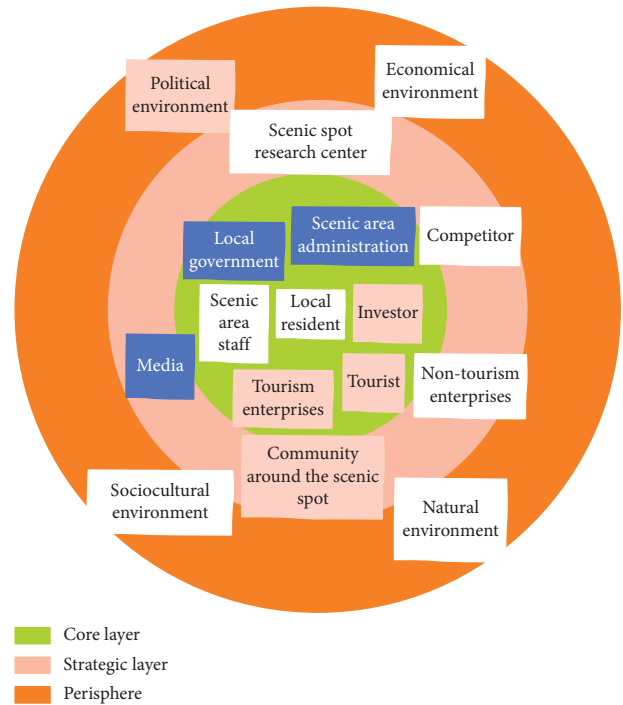


FIGURE 2: Stakeholder hierarchy diagram of tourist scenic spots.

environmental carrying capacity index system goes through the following processes (Figure 3).

From the perspective of stakeholders, the environmental carrying capacity of East Lake Scenic Spot is discussed, so that it can achieve various levels within the scope of the environmental carrying capacity of the scenic spot, and the interest demands of various major stakeholders will ultimately

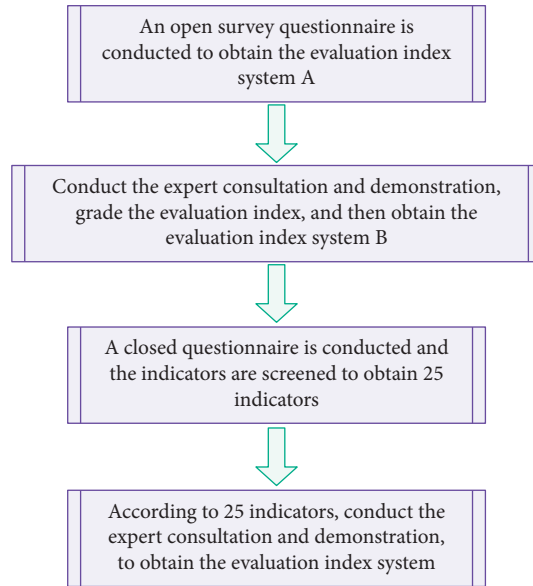


FIGURE 3: Flowchart of the construction index of tourism environmental carrying capacity.

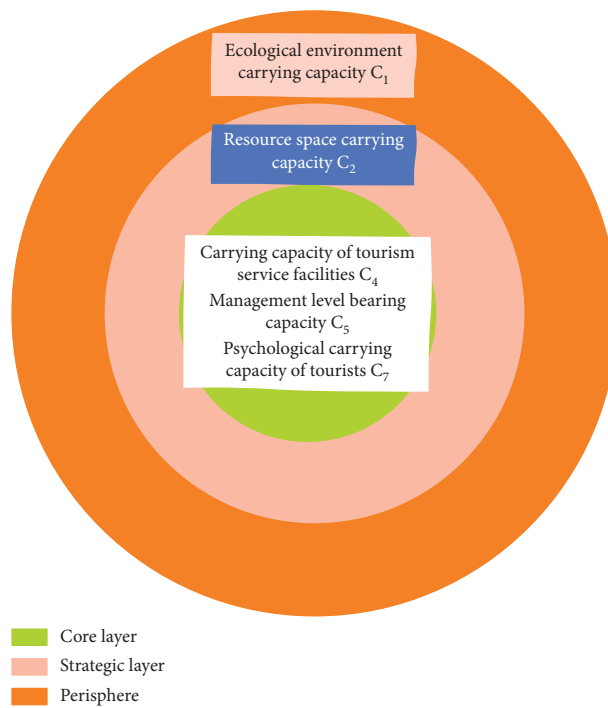


FIGURE 4: Relationship between the restrictive indicators of tourism environmental carrying capacity and stakeholders.

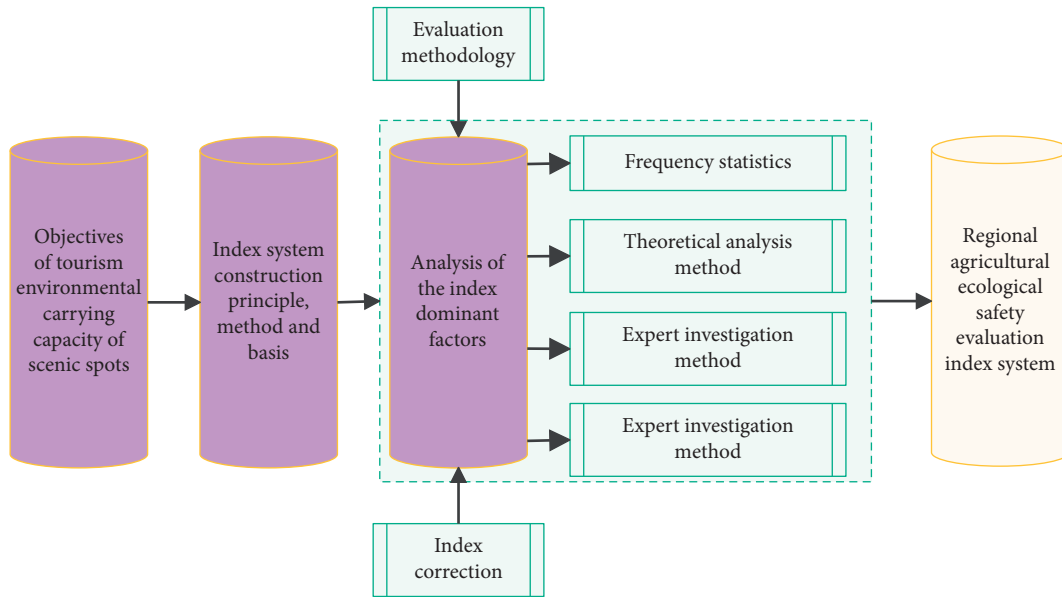


FIGURE 5: Evaluation index system of tourism environment carrying capacity.

serve the realization of scenic spot management goals, as shown in Figure 4.

The expert consultation method is to further seek the opinions of relevant experts and adjust the indicators on the basis of initially proposing evaluation indicators. This study will comprehensively use these four methods (Figure 5). Finally, a better evaluation index system of tourism environment carrying capacity will be obtained.

The clear-level evaluation index system of ecotourism carrying capacity of tourist attractions was constructed (Figure 6). The entire evaluation index system consists of 36 indicators, which belong to 10 domain layers and 3 criterion layers.

The comprehensive conceptual system of tourism environmental carrying capacity divides the value of the carrying capacity component according to different tourism environmental elements and contents. The composition

system of the researched tourism environmental carrying capacity is shown in Figure 7.

Based on the above analysis, the model proposed in this paper is validated on the basis of the above research model. The ecological tourism carrying capacity of popular scenic spots is evaluated, and the analysis is carried out in the form of simulation test, and the evaluation effect of the model in this paper in the carrying capacity of the tourism environment is counted, and the results shown in Figure 8 are obtained.

From the above cluster analysis, it can be seen that the method proposed in this paper performs well in the cluster analysis. Next, the performance of the model proposed in this paper in the evaluation of ecotourism carrying capacity is evaluated, and the results shown in Table 1 are obtained.

From the above research, it can be seen that the evaluation method of ecotourism carrying capacity of popular

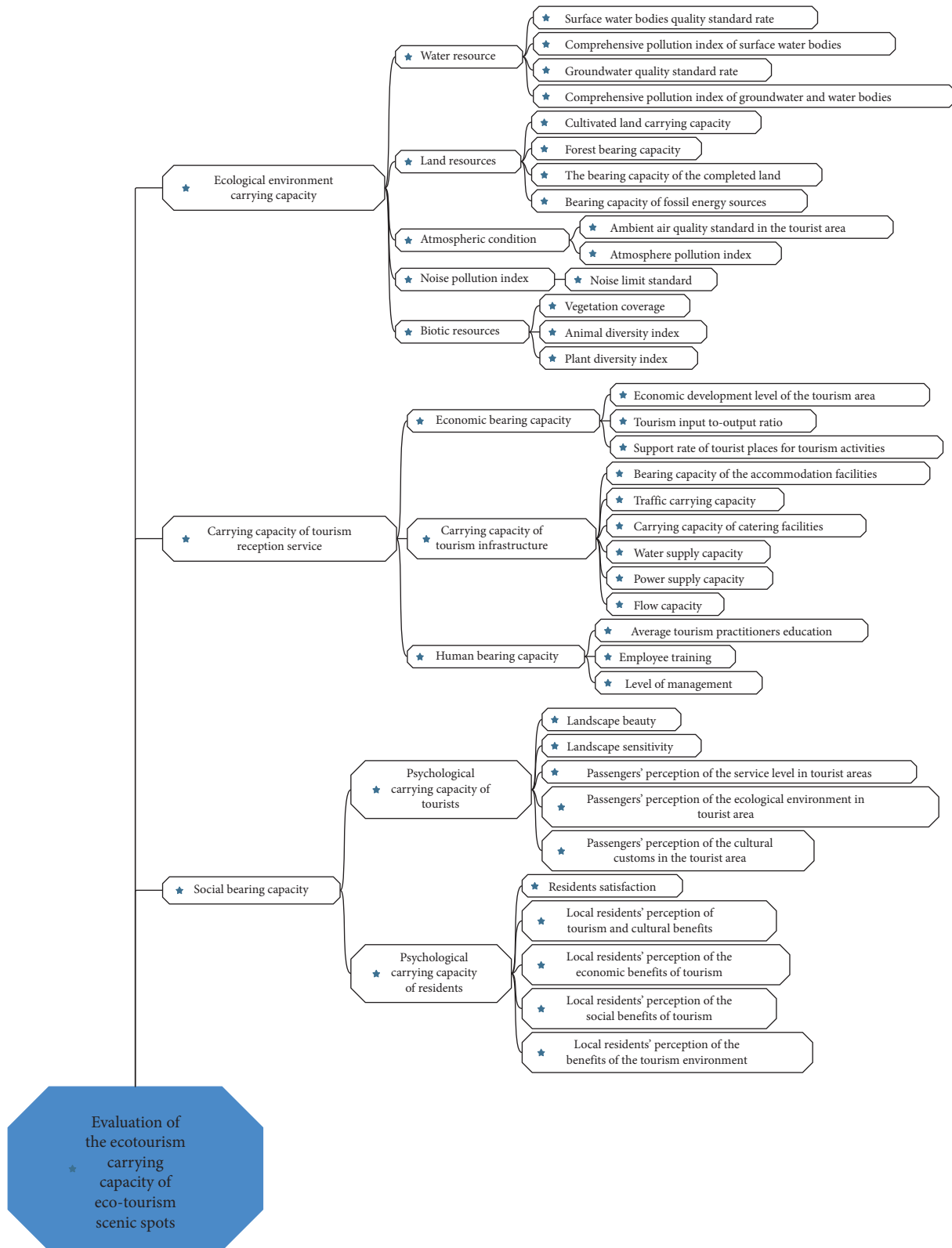


FIGURE 6: Evaluation index system of ecotourism carrying capacity of tourist attractions.

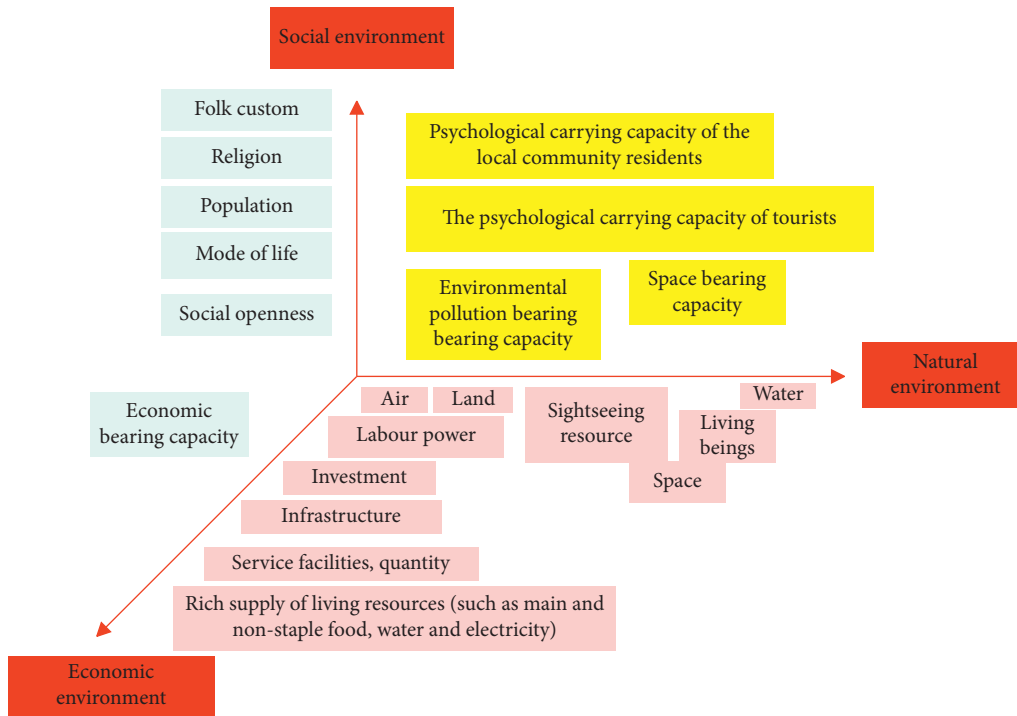


FIGURE 7: Composition system of tourism environment carrying capacity.

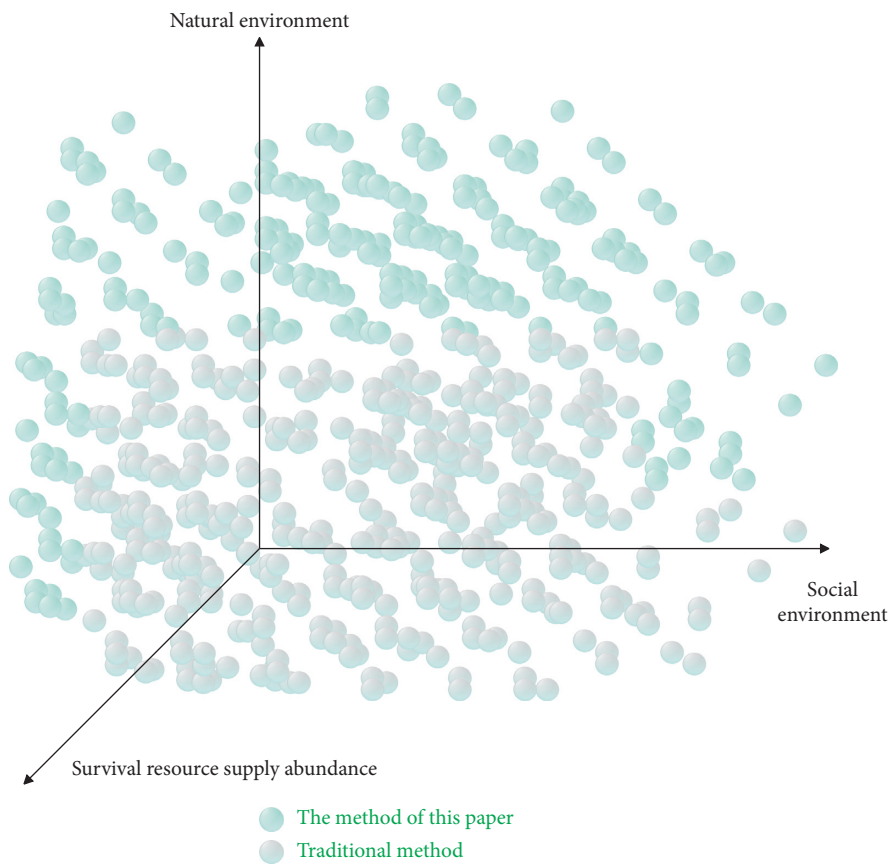


FIGURE 8: Cluster analysis of the effectiveness of the method proposed in this paper.

TABLE 1: Performance evaluation of the model proposed in this paper in the evaluation of ecotourism carrying capacity.

| Num | Model evaluation | Num | Model evaluation | Num | Model evaluation |
|-----|------------------|-----|------------------|-----|------------------|
| 1 | 94.61 | 21 | 89.94 | 41 | 93.96 |
| 2 | 87.25 | 22 | 92.08 | 42 | 91.38 |
| 3 | 94.94 | 23 | 89.32 | 43 | 88.57 |
| 4 | 91.63 | 24 | 88.89 | 44 | 91.00 |
| 5 | 89.08 | 25 | 90.83 | 45 | 88.32 |
| 6 | 89.44 | 26 | 88.26 | 46 | 93.85 |
| 7 | 88.08 | 27 | 93.58 | 47 | 87.27 |
| 8 | 90.11 | 28 | 87.14 | 48 | 93.41 |
| 9 | 95.28 | 29 | 87.35 | 49 | 87.71 |
| 10 | 92.66 | 30 | 93.66 | 50 | 87.33 |
| 11 | 90.42 | 31 | 94.43 | 51 | 90.68 |
| 12 | 87.75 | 32 | 93.69 | 52 | 94.97 |
| 13 | 87.81 | 33 | 95.22 | 53 | 87.38 |
| 14 | 95.75 | 34 | 93.78 | 54 | 93.45 |
| 15 | 88.90 | 35 | 92.67 | 55 | 90.17 |
| 16 | 91.76 | 36 | 87.87 | 56 | 93.79 |
| 17 | 94.32 | 37 | 94.81 | 57 | 88.80 |
| 18 | 88.64 | 38 | 95.06 | 58 | 91.44 |
| 19 | 94.68 | 39 | 91.13 | 59 | 88.85 |
| 20 | 88.77 | 40 | 89.95 | 60 | 95.03 |

scenic spots based on set pair analysis proposed in this paper has a good effect.

5. Conclusion

The research on the environmental carrying capacity of tourist attractions can reasonably determine the service management level, environmental facilities, and resource development status of scenic spots and provide rational suggestions for scientifically formulating scenic spot management plans and management measures. At the same time, it can monitor the resource development status of the scenic spot, the level of service management, the number of tourists, and other factors in real time. Therefore, the research on the environmental carrying capacity of tourist attractions not only improves the service management level of the scenic spots but also makes various environmental facilities and resource conditions in the scenic spots in a benign interactive state, and finally the tourist satisfaction of tourists is sublimated. This paper combines the set pair analysis method to evaluate the ecological tourism carrying capacity of the scenic spots and improves the quantitative effect of the ecological tourism carrying capacity of the scenic spots.

Data Availability

The labeled dataset used to support the findings of this study is available from the corresponding author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

Acknowledgments

This study was sponsored by Wuhan Technical College of Communications.

References

- [1] Y. Yusof, K. Jusoff, Y. Ibrahim, and Z. Awang, "The influence of green practices by non-green hotels on customer satisfaction and loyalty in hotel and tourism industry," *International Journal of Green Economics*, vol. 11, no. 1, pp. 1–14, 2017.
- [2] I. Andersson and L. James, "Altruism or entrepreneurialism? The co-evolution of green place branding and policy tourism in Växjö, Sweden," *Urban Studies*, vol. 55, no. 15, pp. 3437–3453, 2018.
- [3] C. Irazábal, "Coastal urban planning in the 'green republic': tourism development and the nature-infrastructure paradox in Costa Rica," *International Journal of Urban and Regional Research*, vol. 42, no. 5, pp. 882–913, 2018.
- [4] H. Wee, N. A. Mustapha, and M. S. Anas, "Characteristic of green event practices in mice tourism: a systematic literature review," *International Journal of Academic Research in Business and Social Sciences*, vol. 11, no. 16, pp. 271–291, 2021.
- [5] A. D. Do, Q. V. Nguyen, D. U. Nguyen, Q. H. Le, and D. U. Trinh, "Green supply chain management practices and destination image: evidence from Vietnam tourism industry," *Uncertain Supply Chain Management*, vol. 8, no. 2, pp. 371–378, 2020.
- [6] I. Mykola, A. Vadym, P. Anatoliy, H. Yurii, and R. Nataliia, "Features of the content and implementation of innovation and investment projects for the development of enterprises in the field of rural green tourism," *International Journal of Management*, vol. 11, no. 3, pp. 304–315, 2020.
- [7] M. Simanjuntak and A. Rumondang Banjarnahor, "Re-investigating the roles of green service-scape to improve tourism performance marketing service dominant logic perspective: a literature review," *Quantitative Economics and Management Studies*, vol. 2, no. 4, pp. 214–232, 2021.
- [8] Z. Lili, "Retracted article: prediction of air pollutants and rural green tourism factors based on dynamic migration," *Arabian Journal of Geosciences*, vol. 14, no. 17, pp. 1777–7, 2021.
- [9] H. L. T. Trang, J.-S. Lee, and H. Han, "How do green attributes elicit pro-environmental behaviors in guests? The case of

- green hotels in Vietnam,” *Journal of Travel & Tourism Marketing*, vol. 36, no. 1, pp. 14–28, 2019.
- [10] N. Kongbuamai, Q. Bui, H. M. A. U. Yousaf, and Y. Liu, “The impact of tourism and natural resources on the ecological footprint: a case study of ASEAN countries,” *Environmental Science and Pollution Research*, vol. 27, no. 16, pp. 19251–19264, 2020.
- [11] R. Kisiel, J. Zielińska-Szczepkowska, and D. Taradejna, “Natural and cultural resources of Green Kurpie as drivers of tourism development,” *Ekonomia i Środowisko-Economics and Environment*, vol. 65, no. 2, 15 pages, 2018.
- [12] R. Rahmawati, A. R. Suprapti, S. R. H. Pinta, and P. Sudira, “Green entrepreneurship: a study for developing eco-tourism in Indonesia,” *The Journal of Asian Finance, Economics and Business*, vol. 8, no. 5, pp. 143–150, 2021.
- [13] V. Milla, A. Villalobos, L. Wallbott, and M. Lederer, “Green and social beyond a postcard scene? Sustainable tourism in Costa Rica and vietnam,” *Sociology*, vol. 8, no. 2, pp. 50–67, 2020.
- [14] R. Rahmawati, S. Soenarto, A. R. Suprapti, R. Handayani, and P. Sudira, “Green entrepreneurship development strategy based on local characteristic to support eco-tourism continuous,” *Jurnal Manajemen*, vol. 23, no. 2, pp. 257–273, 2019.
- [15] E. A. Dzhandzhugazova, E. L. Iljina, A. N. Latkin, A. R. Davydovich, and V. V. Siganova, “Problems of development of ecological tourism on the territory of national parks of Russia,” *Ekoloji*, vol. 28, no. 107, pp. 4913–4917, 2019.
- [16] O. Adamchyk, “Innovative sources of increasing the competitiveness of rural green tourism enterprises,” *University Economic Bulletin*, no. 46, pp. 38–45, 2020.
- [17] D. Cvijanović, D. Sekulić, and D. Pavlović, “Are green hotels suitable for the development of entrepreneurship in tourism?” *Ekonomika preduzeća*, vol. 66, no. 7-8, pp. 424–432, 2018.
- [18] S. Mohanty, S. Mishra, and A. Mohanty, “Green human resource management: a review of integration of environment and hrm practices in hotel industry,” *Journal of Environmental Management and Tourism*, vol. 12, no. 6, pp. 1572–1575, 2021.
- [19] S. V. Kalchenko, A. O. Hutorov, L. S. Bezuhla, O. A. Leushina, T. V. Popova, and O. V. Dorokhov, “Managing the SOCIO-economic development OF small forms OF green tourism,” *Series II: Forestry Wood Industry Agricultural Food Engineering*, vol. 14, no. 1, pp. 141–152, 2021.