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Research Article

Research on Landscape Ecology of Planning and Management of Ecotourism Area Considering Scientific Calculation Method

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With the continuous development of social economy, ecotourism has also been greatly developed, and the ecological environment has been paid more and more attention by people. As a part of ecotourism, the planning and management of ecotourism areas has gradually become one of the focuses of research. In particular, the concept of "harmonious coexistence between man and nature" has gradually gained popularity. So how to protect the environment and promote the upgrading of ecotourism and landscape management in the development process is extremely important. This paper introduces the scientific calculation method and based on the scientific calculation method, first of all, it analyzes the relationship between landscape management and ecotourism, and combines the landscape elements such as scenic spots and corridors to build a corresponding network structure to support the planning practice of ecotourism areas, to maintain ecologically sustainable planning and development. Landscape ecology and tourism area management are important explorations in promoting ecotourism. The simulation experiment results show that the scientific calculation method is effective, which can provide support for the planning and management of ecotourism areas, and provide exploration for the construction of a harmonious environment between man and Earth.

1. Introduction

With the continuous development of social economy, the ecological environment has become one of the necessary development factors, and it has received more and more attention [1, 2]. The deterioration of the ecological environment will also affect the development of tourism resources. Therefore, while developing tourism resources or conducting tourism construction, the protection of the local ecological environment should be fully considered [3, 4]. Experts in the industry introduced ecology into tourism, thus integrating the theories in the two fields, and thus received the joint support of the ecology and tourism circles [5, 6]. In the initial research, most of the research mainly focused on the concept of ecotourism, but these practices are relatively few. Therefore, the ecological basic research on tourism is relatively small and cannot be fully implemented [7, 8].

The initial ecotourism mainly focused on the tourism natural landscape and tourism human geography of the place of ownership as the research objects. Therefore, when these natural resources are opened to the outside world, they often do not damage the tourism resources of the place of origin; especially in improvement of the economic and social environment, to further inherit the national culture. With the gradual application and deepening of the ecological environment, the improvement of these ecological environments has also been favored by many tourists [9, 10].

In view of these limitations and needs, how to implement these ecological environment theories to the corresponding action level? In this process, it is necessary to comprehensively consider the development process of tourism attribution and integrate ecotourism theories throughout the entire process of design, development, and improvement. Therefore, the treatment in accordance with local conditions must be implemented during the development of natural

resources, to adapt measures to local conditions while ensuring the integrity of the ecological environment of the tourism attribution [11, 12]. The development of heterogeneous categories shall be ensured according to different spaces and the sustainable development of the tourism attribution shall be maintained. Based on the scientific calculation method, starting from a certain ecotourism attribution as the cut-in point, landscape planning and management theory, landscape elements such as spots, corridors are integrated, to build a network structure for the ecological construction and development of tourism attribution, and explore the landscape ecological development of tourist attribution.

2. Related Works

The ecotourism area and landscape ecology should be planned accordingly, and the theories of the two should be integrated. The development and construction of the tourism attribution area is considered as the main practice point. In the actual ecotourism attribution planning, the following principles need to be followed, mainly including protecting the originality and integrity of the pleasant landscape. From the perspective of human construction and development process, people prefer areas in natural resources that are covered by vegetation or water. At the same time, in the process of natural resource development, there should be a certain permeable natural resource landscape, which is also loved by people [13, 14]. For the continuous development of urbanization, urban residents are more advocating or keen to be in close contact with nature, especially enjoying the feeling of being surrounded by nature. This is not only the initial driving force for the birth of ecotourism but also the basic starting point of ecotourism planning. Therefore, for the ecological landscape, this is all the prerequisites for the sustainable development of ecotourism. That is, the original and perfect pleasant landscape needs to be protected [15, 16].

Highlight the aesthetic value of natural landscapes. From the perspective of human perception, the value of aesthetics is mainly reflected in the landscape structure and spatial scale. The variety and variability of these factors can delineate the beauty, serenity, charm, and variety of nature. These advantages can attract enough tourists to visit and thus create an appropriate label for the ecological attribution of the landscape. Through these characteristics and superiority, the landscape can not only make visitors linger on and leave a stunning scenery in the ordinary perspective but also can further enlarge and transmit through the visitors from a certain angle, and enhance the image of the tourist attribution [17–20].

Reflect the unique charm of cultural landscape. The cultural landscapes are developed after the integration of culture and natural resources to form a public-oriented living environment. For different regions, cultural landscapes often lead many tourists with different uniqueness. The characteristics of resources are constructed, perfected, excavated, and sorted to form certain spatial and temporal characteristics, which are displayed in a fixed way. Meanwhile, certain cultural connotations are directly injected into the ecological environment, which can achieve an effective combination of humanities and natural landscapes, so as to realize the connotation of the landscape of the ecotourism environment, and enhance a certain degree of visibility and attractiveness [21, 22].

Hidden traces of human intervention in the landscape as much as possible. From the perspective of ecological tourism attribution, ecotourism is also a tourism attribution. There will be certain infrastructure facilities, such as tourist roads, tourist lounges, and toilets. The construction of these artificial facilities may cause a certain degree of inconsistency with natural resources, and even destroy the original shape and ecology due to shape and color, and various reasons, including signs, materials, etc. Therefore, in the whole process of artificial construction, it is necessary to reflect the design and natural concept as much as possible, hide the traces of artificial construction, and realize the original natural state of ecotourism, natural ecology, and the overall feeling of ecotourism belonging [23, 24].

Functional zoning varies according to different landscapes. From the perspective of the scale of construction, whether it is a mesoscale or a small-scale, there will be a heterogeneity caused by the combination of natural resource landscapes or different ecological types Therefore, in the actual construction and development process, comprehensive consideration is needed. On the one hand, measures need to be adapted to local conditions; on the other hand, it is necessary to carry out different tourism zoning or construction according to different landscape characteristics, and cultivate or assist different tourism products. This method can not only help display tourism resources but also protect the ecotourism environment in advance, realize the cooperation and practice of natural resources, maintain the diversity of biological community, and realize the coexistence of diversity of plants and organisms [25].

Restoration of native species is also another aspect of this relevance. For native vegetation resources, it can be viewed from the perspective of ecological environment as an important ecological barrier; moreover, from the perspective of biological populations, it is also an important living environment for ancient and famous trees. Such universal planting is not only conducive to the restoration of the local landscape pattern spot, can also reflect the level of vegetation protection, and promote the analysis of biodiversity. It not only improves the vegetation coverage but also realizes the ecological landscaping of the landscape and enhances the aesthetic needs of tourists.

The coordination in the network as a whole. From the perspective of ecological tourism attribution, it is necessary to fully consider the three factors of pattern spot, pipe corridors, and primitives, and make full use of the landscape characteristics and corresponding values of the attribution. It is also necessary to cultivate tourism image, reflect the main body of tourism, and realize brand promotion of tourist destinations, so as to properly handle the relationship between natural resource characteristics and nonnatural landscapes; therefore, the harmonious intergrowth between humans and nature, can be handled appropriately,

fundamentally reduce the conflicts between landscapes and people and realize the sustainable development of tourism attributions. The corresponding ecotourism should be regarded as the fundamental purpose of natural resource protection and sustainable development.

Taking the flood season as an example, for waters covered by natural resources, water regimes, artificial facilities, and seepage conditions shall be comprehensively considered for artificial construction, so as to achieve the overall coordination of the network and reduce the risks and disasters brought by natural resources. The corresponding digital resources are used to integrate the three factors more comprehensively, as is shown in Figure 1:

The development of information technology has brought different changes to the tourism pattern of natural resource tourists. For example, tourist cooperation and research-based tourism trends are more effective, especially knowledge sharing enabled by information technology. People can obtain travel experience and recommended routes through the Internet, as shown in Figure 2, and they can also use the corresponding Internet and distance education to communicate industry experts, so as to improve their self-learning ability.

3. Construction of TGJ Mode

In the spatial structure of natural resources landscape design, the structure of the corresponding ecotourism network composed of three factors: pattern spots, pipe corridors, and primitives are mainly reflected, and the landscape chain style design is achieved from visual landscape, ecological landscape, and function. The tourism-related production and consumption all take place in such a network structure, and realize the pattern, pipe corridor, and primitive mode of the ecotourism attribution, which can become the TGJ mode. Its core lies in the protection of ideas and the realization of planned routes.

As far as the ecology of natural resources is concerned, it focuses more on the effect of scale and realizes the comprehensive functions and regional characteristics of tourism ecology from the macro to the micro, which can be supported by multiple principles.

3.1. Principle of Integrity. For landscape ecology, it is a complete chain concept, involving and covering both natural resources and human factors. It is necessary to comprehensively consider the ecological landscape as a whole system in order to realize the overall concrete application. For tourism planning, it is a comprehensive planning of multiple parts and elements of the tourism attribution to achieve macro and micro integration.

3.2. Analysis of Heterogeneity. For the tourist attribution of natural resources, due to the environments in which different species and different environment where the various plants exist, there are differences and variations in different time and space Therefore, it is very important for the development, construction, and management of tourism attribution.

3.3. Diversified Assessment. For different natural resource tourism attributions, due to different tourism activities, they attract different human construction and development levels, so it is necessary to improve a certain degree of viewing. As the actual environment for human viewing and sightseeing, the combined ecological environment needs to be protected; therefore, the tourism planning of the ecological environment focuses on the maintenance of the diversified landscape ecology and the creation of diversified tourism spaces to avoid monotonous urban landscapes.

3.4. Comprehensive Analysis. In addition to the tourism attribution provided by the natural resources, *i* natural ecological harmony, human construction and artistic effects, and the integrating beauty between the above two are displayed before us. Such tourism attributions include both natural resource landscapes and cultural integration. Not only is the corresponding tourism service offered, but it also allows tourists to enjoy a different cultural feast and promotes a further characteristic effect of local tourism.

Combining big data theory and scientific calculation methods, a big data fuzzy membership function is generated, and then the total membership function can be obtained through comprehensively quantification by the normalization formula, comprehensively evaluate and analyze the research objectives. The specific calculation steps are as follows:

(1) Establishment of an evaluation index system. For the landscape, the overall control of variables is realized.

(2) Determination of the big data system model. Common scientific computing models include

The specific calculation of the folded big data model is shown in formula (1):

$$f(x) = x^3 + ux. \tag{1}$$

The specific calculation of the cusp big data model is shown in formula (2):

$$f(x) = x^4 + ux^2 + vx. \tag{2}$$

The specific calculation of the dovetail big data model is shown in formula (3):

$$f(x) = x^5 + ux^3 + vx^2 + wx. \tag{3}$$

The specific calculation of the butterfly big data model is shown in formula (4):

$$f(x) = x^6 + ux^4 + vx^3 + wx^2 + tx. \tag{4}$$

4. Landscape Ecological Data Survey and Analysis

For data surveys in landscape ecology, data are the basis for planning. Therefore, it is necessary to collect basic information such as natural resources and social influence factors within the planning scope, and summarize and organize them to prepare for the subsequent landscape ecological planning. At the same time, it is necessary to fully understand and investigate the composition of abiotic and biotic, modern artificial landscape structure, ecological phenomena, specific human activities and their corresponding consequences, so as to realize the investigation and analysis of ecological data.

On the basis of collection and aggregation of data, the data are fully excavated and analyzed to realize the division of the ecological area of tourism attribution, and judge the development, protection, and construction areas of artificial construction.

(1) From the perspective of ecology, landscape ecology can be classified. Different landscape elements can be analyzed to construct corresponding landscape ecological divisions. According to different landforms and vegetation coverage, the classification of landscape ecology can be realized. Divide the regions according to the corresponding ecological function environment.

(2) Landscape ecological evaluation is to assess the current situation of landscape ecology and provide a scientific basis for the improvement of the ecological environment of the region, the rational use of natural resources, and the sustainable development of the economy.

5. Landscape Planning and Design

Landscape optimization is mainly to adjust and design according to the corresponding landscape pattern and landscape function. In other words, it is to determine the landscape pattern, divide the structural area and functional area, and realize the calculation of different indicators, including dominance, diversification, fragmentation, and other indicators.

From the perspective of overall coordination and optimization, the units and combinations of the ecological landscape shall be clarified, to realize the main body of the ecological landscape, give the corresponding social and cultural attributes, realize the structured implementation of spatial planning, and construct different landscape ecological functional units.

(1) The overall macro model. Analyze the foundation and optimize the structure. The structure is the basis of the function, and the realization of the function is based on the coordinated and orderly spatial structure of the landscape ecosystem. (2) Division of mesoscopic functions. For analysis of mode points, only simple vehicles such as walking or canoeing are allowed to enter. (3) Micro-unit design. Coordinated design of TGJ patterns. Three basic elements of landscape play an important role in the process of landscape optimization, mainly including pattern points, pipeline corridors, and the original element is landscape. Publicity to improve the value of scenic spots, including ecological education for tourists, is conducive to the protection of scenic spots and promotes the overall improvement of social ecological awareness.

If gravity is greater than buoyancy, the boat will sink, which is called a sinking body; if gravity is less than buoyancy, the boat can float, but only when the metacenter is higher than the center of gravity, the boat can stabilize and balance, otherwise, it will topple. That is, "water can carry a boat, and it can also overwrite a boat." Carrying a boat is the effect of buoyancy, and overturning the boat is out of balance. It shall be considered after combining the comprehensive consideration of natural resources that can be integrated, as shown in Figure 3.

5.1. Sustainable Management of Landscape. The continuous management of landscape ecology leads to planning. Through different principles of landscape ecology, the reasonable structural functions can be used to realize the mutual benefit and intergrowth, and virtuous circles of the system, while the hardware system realizes the management and supervision of landscape changes. The specific TGJ management mode can be divided into eight specific tasks, as shown in Figure 4:

The significance of the model is not only to provide a planning process. The introduction of principles and methods of landscape ecology helps to realize the idea of design combining nature through planning. The basic norms of the TGJ model reflect this theme and can be reflected in the relevant index system of landscape ecology to meet the requirements of sustainable development of scenic spots, that is, ecological balance and harmony between man and Earth, and also meet the target set by ecotourism planning and design.

A three-level index framework is constructed for the vulnerability evaluation index system of the key infrastructure system of the natural resource tourism attribution by trial. That is, the vulnerability evaluation index of the city's key infrastructure system consists of three secondary indicators, which are the basic network image of natural resource tourism attribution, the government affairs network image of natural resource tourism attribution, and the life network image of natural resource tourism attribution. In this indicator system, the vulnerability of the key infrastructure system of the place where natural resource tourism attributions is manifested in the complex interactive relationship of these three dimensions. Among them, the basic network image of natural resource tourism attribution is the basic indicator, the government network image of natural resource tourism attribution is the characteristic index, and the living network image of natural resource tourism attribution is the trend indicator, forming a progressive and interactive system structure (The details are shown in Figure 5).

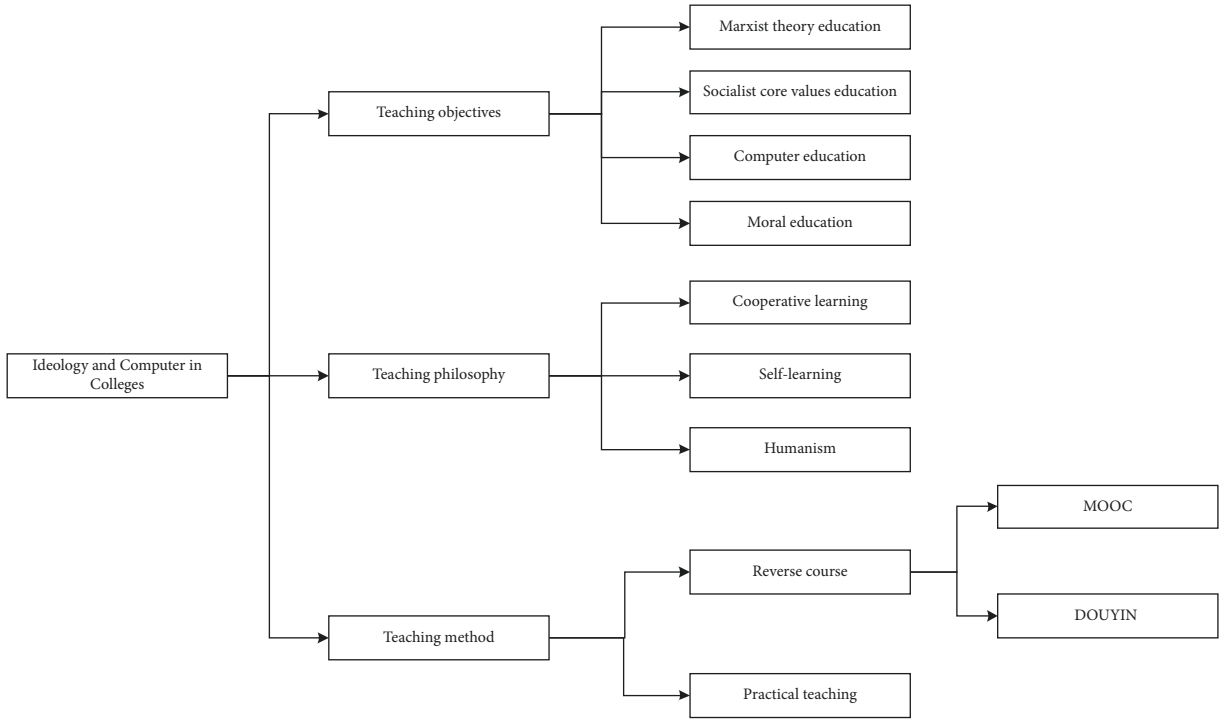

Figure 1: Digitization of natural resources.

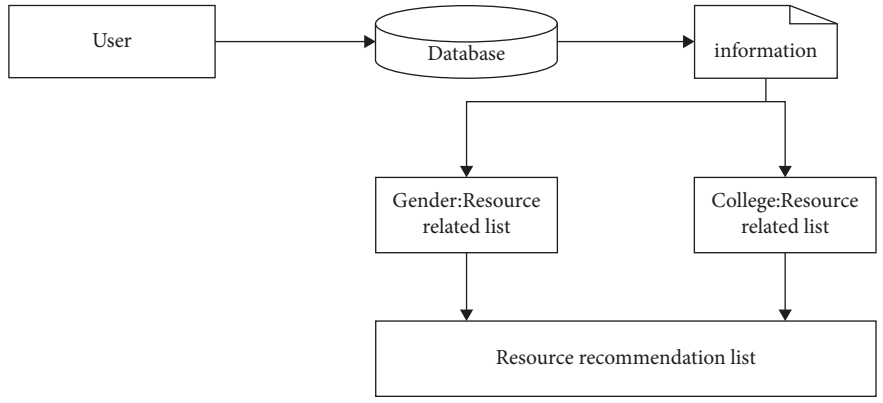

Figure 2: User registration process.

6. Simulation Experiment Analysis

6.1. Construction of Indicator System. As the basic environment for the realization of landscape ecology, the evaluation index of natural resources tourism attribution needs to adhere to the comprehensive principles of mutual independence, strong pertinence, and strong representativeness to ensure that the evaluation indicators can truly reflect the connotation and specificity of the tourism attribution, the specific structure, specific functions, specific positioning, and characteristics of tourism, The development status and main characteristics of the infrastructure characterizing and measuring comprehensively the tourism attribution not only reflect the common characteristics of tourism attribution but also feedback the characteristics of tourism attribution, which is convenient for collecting the corresponding data.

Based on the existing research results on the vulnerability evaluation of the city's key infrastructure, combined with the theory of the vulnerability of the city's key infrastructure connotation and main communication elements of the vulnerability of the city's key infrastructure systems, three secondary indicators and 17 three-level indicators have finally been determined The evaluation index system and corresponding weights are shown in Figure 6, which consists of 1 first-level index, 3 second-level indicators, and 17 third-level indicators.

According to the characteristics of the indicators, different observation points are evaluated by selecting appropriate observation angles, and using appropriate evaluation methods (as shown in Table 1).

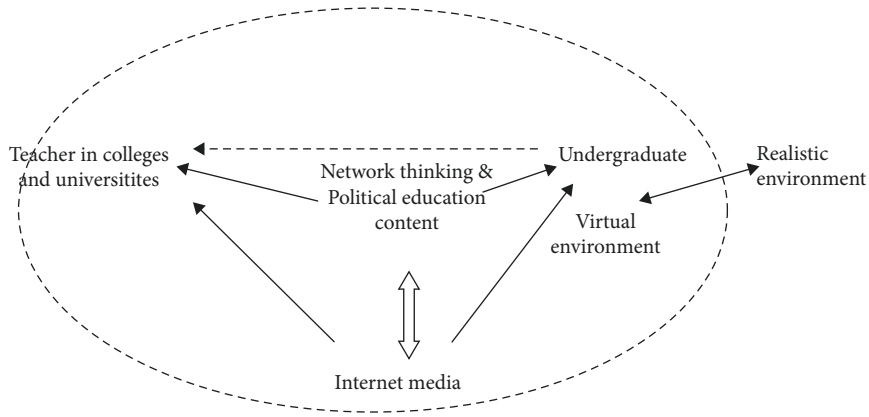

Figure 3: Information network media.

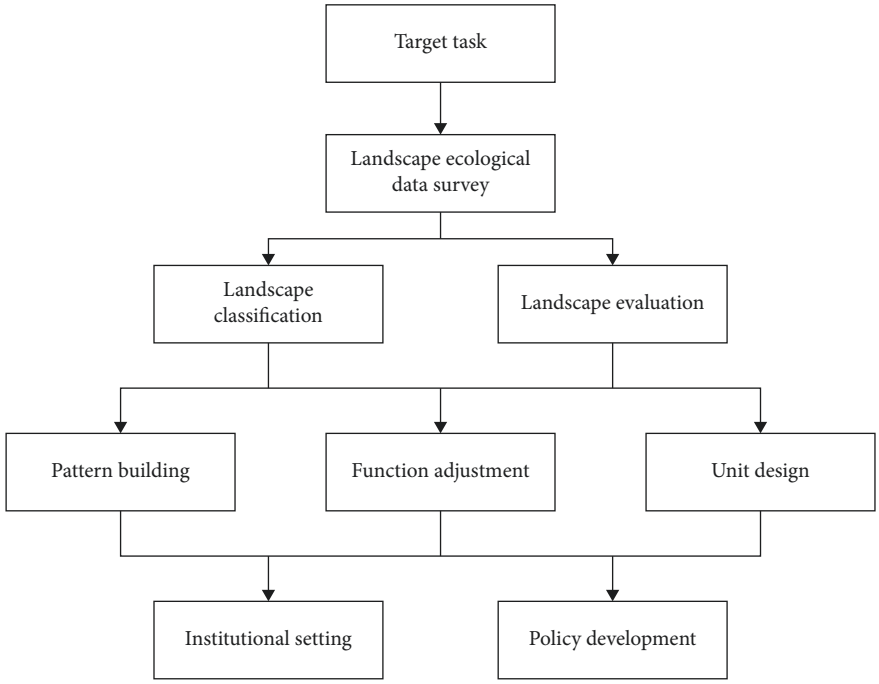

Figure 4: Technical route of landscape ecological planning.

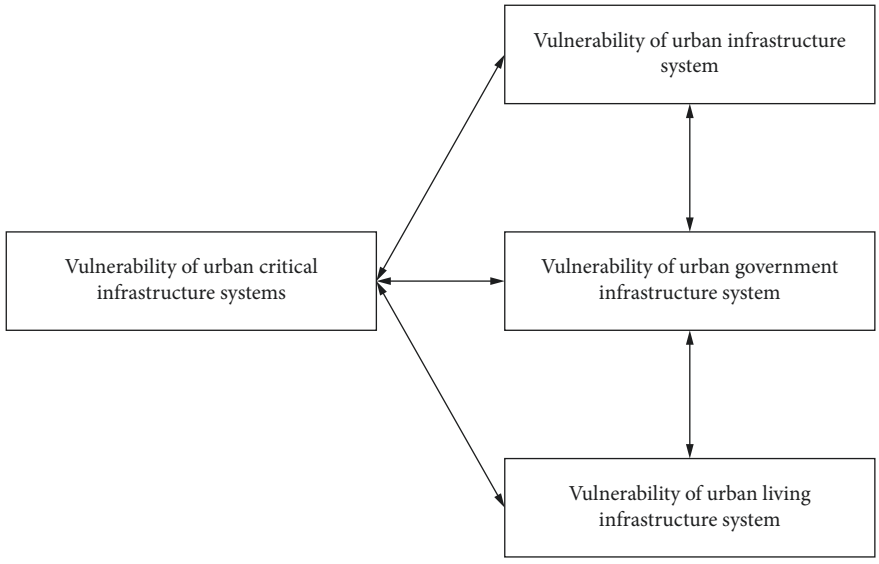

Figure 5: Vulnerability evaluation model of key infrastructure system of natural resource tourism attribution.

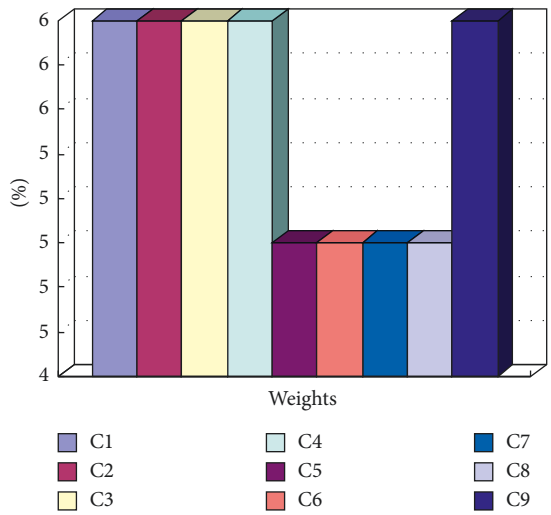

Figure 6: The system of vulnerability assessment index system of scenic spots.

Table 1: Observation points of three-level evaluation indicators.

Three-level evaluation index C	Observation point
Number of news per capita C1	The number of news is obtained by searching for the names of tourist attractions on baidu for a limited time
Number of weibo mentioned per capita C2	The number mentioned on weibo is obtained by searching the names of tourist attractions on weibo within a limited time
Number of WeChat mentioned per capita C3	The number of WeChat mentioned is obtained by searching for the names of tourist attractions on WeChat within a limited time
The number of web page mentioned per capita C4	The number of web page mentioned is obtained by searching the names of tourist attractions on baidu webpages within a limited time
Number of short video mentioned per capita C5	The number of short video mentioned is obtained by searching the names of tourist attractions on douyin for a limited time
Government portal website C6	The ALEXA website ranking service is used to find the global comprehensive ranking of the official website of each tourist attraction
Government affairs weibo popularity C7	Three factors including the number of fans, the number of reposts, and the number of blog posts in the city government affairs weibo in sina weibo
Government WeChat popularity C8	Three factors of city government WeChat readings, likes, and articles in WeChat
Government information disclosure C9	Search on baidu web page
Political-civilian interactive platform C10	Ranking of e-government APP users
Government's response to public opinion C11	Public opinion events are based on Baidu's keyword hot search list and sina weibo hot search list
Environmental positive emotion C12	The texts from the internet is grasped for performing sentiment analysis to obtain positive sentiment values
Public security management positive emotion C13	Gripping tool is used to grasp the texts from the Internet, and then perform sentiment analysis to obtain positive sentiment values
Local people's positive emotions C14	Gripping tool is used to grasp the texts from the Internet, and then sentiment analysis is performed to obtain positive sentiment values
Local tourism positive emotion C15	Gripping tool is used to grasp the texts from the Internet, and then sentiment analysis is performed to obtain positive sentiment values
Food safety positive emotion C16	Gripping tool is used to grasp the texts from the internet, and then sentiment analysis is performed to obtain positive sentiment values
Citizen's language civilization degree C17	The proportion of the number of uncivilized related words searched for within a limited time to the number of the praises of the city

6.2. Landscape Design by Location. The landscape on the mesoscale is mainly manifested as the heterogeneity of the natural resource landscape caused by specific human activities. Such a landscape integrates artificial landscapes and at the same time integrates specific large forests and water areas into large natural environments to achieve specific space planning; therefore, the largest possible reduction in the number of artificial landscapes should be achieved from the perspectives of color and layout, and the area of artificial landscapes should also be reduced as much as possible. The

landscape on the mesoscale is mainly manifested as the heterogeneity of the natural resource landscape caused by specific human activities. Such a landscape integrates artificial landscapes and simultaneously integrates large forests and water areas into large natural environments to achieve specific space planning. Therefore, the maximum reduction in the number of artificial landscapes should be achieved from the perspectives of color and layout, and the area of artificial landscapes should also be reduced as much as possible. First, the color is basically similar to the base. Second, part of the road sections are covered by artificial planting trees or shaded, so that visitors can control the artificially constructed scenery to the greatest extent when viewing the natural landscape, and realize the necessary cleaning.

6.3. Typical Visual Landscape Planning. As the change of viewing scale, this area involves typical visual landscapes such as snow-capped mountains and glacier landscapes, plant landscapes, villages and towns landscapes, road landscapes, and architectural landscapes. They are the core of the three-dimensional network structure of the landscape in the region. The snow-capped glacier landscape is the soul of the Meri Snow Mountain Eco-tourism Area. Its originality, integrity and mystery must be protected, and all summit activities must be rejected. The plant landscape occupies an extremely important position in the landscape resources of the ecotourism area, and the continuity of the resource spot must be emphasized, and the distribution of the unique plant community must not be changed.

Corresponding fruit trees in the village can be used as green plants for tourists to watch; meanwhile, they can also be used as cash crops, which can be used for goods trading Therefore, in the spatial planning of villages and towns, such a survival and sharing model is the final result of long-term harmonious coexistence between man and nature. It not only reflects the organic combination of local artificial architectural features and natural ecological environment but also integrates local Buddhist culture improving extremely high value for viewing and preservation, Therefore, such a village and such a spatial layout need to be protected to ensure its integrity, naturalness, and integrity in order to maintain the harmony and unity of the village and the natural environment.

7. Discussion

For landscape management, it can be calculated through the corresponding evaluation indicators, and the evaluation score for the protection and development of the scenic spot is obtained, which is 95 points. It has characteristics in the ecological management of scenic spots, the protection of resources, and the construction of tourism infrastructure, but there are still shortcomings in the reconstruction of artificial buildings, sustainable development, publicity, and education. Therefore, the effectiveness and necessity of ecological management needs to be further popularized, to achieve fixed-point poverty alleviation, actively publicize its role and significance, to achieve further harmony and further promotion of the TGJ model. The simulation experiment results show that the scientific calculation method is effective and can support the planning and management of landscape ecology in ecotourism areas, clarify the characteristics of landscape ecological management, and analyze its shortcomings.

8. Conclusion

With the continuous development of social economy, how to protect the environment during development, especially to ensure the coordination of the natural resource system, managers, and tourists, so that the rights of all parties are protected is extremely important. In this paper, by introducing scientific calculation methods and sorting out the landscape optimization process of tourism attribution, the TGJ model is explored, which is the three models of pattern spots, pipe corridors, and primitives, and a corresponding network structure is built for the ecological tourism area, to ensure the protection of natural resources and the environment, the sustainable development of the tourism industry, and improve the effect and quality of ecotourism. The results of the simulation experiment show that the scientific calculation method is effective, can support the effective adjustment and resolution of development and environmental contradictions, and has important reference significance for other natural resource scenic spots.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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and Technical College, the name of the project is Research on the Countermeasures for the Development of the Beautiful Countryside Construction and Modern Tourism in Guangzhou, project no. KYRC2020-015.

References

[1] N. S. Idris, M. A. Mustapha, N. Sulaiman, S. Khamis, S. Mohd Husin, and N. D. Ahmad Darbis, "The dynamics of landscape changes surrounding a firefly ecotourism area," *Global Ecology and Conservation*, vol. 29, no. 17, pp. 1741–1749, 2021.

[2] M. A. D. Cruz, S. Nakamura, N. Hanasaki, and J. Boulange, "Integrated evaluation of changing water resources in an active ecotourism area: the case of puerto princesa city, palawan, Philippines," *Sustainability*, vol. 13, no. 3, pp. 1–8, 2021.

[3] R. Parmawati, H. W. S. Putra, and A. S. Kurnianto, "Ecotourism planning on the rapid-growing economic area: a study of pacitan, Indonesia," *Asean Journal on Hospitality and Tourism*, vol. 16, no. 2, p. 54, 2018.

[4] C. Chirozva, "Community agency and entrepreneurship in ecotourism planning and development in the great limpopo transfrontier conservation area," *Journal of Ecotourism*, vol. 14, no. 2-3, pp. 185–203, 2015.

[5] K. Swangjang and P. Kornpiphat, "Does ecotourism in a Mangrove area at Klong Kone, Thailand, conform to sustainable tourism? A case study using SWOT and DPSIR," *Environment, Development and Sustainability*, vol. 23, no. 1, pp. 1–6, 2021.

[6] T. Kiper, O. Uzun, and T. Üstün Topal, "Rural development oriented ecotourism planning on catchment basin scale," *The Case of Pabudere and Kazandere Catchment Basins*, vol. 6, no. 4, pp. 59–67, 2017.

[7] T. A. . Binoy, "Ecotourism for eco friendly guest and green host - a case study on thenmala ecotourism project, Kerala," *Atna Journal of Tourism Studies*, vol. 6, no. 1, pp. 1–9, 2016.

[8] A. Zhang, L. Zhong, Y. Xu, L. Dang, and B. Zhou, "Identifying and mapping wetland-based ecotourism areas in the first meander of the yellow river: incorporating tourist preferences," *Journal of Resources and Ecology*, vol. 6, no. 1, pp. 21–29, 2015.

[9] L. Jing, "Reverse logistics network for waste in ecotourism area based on quad tree classification," *Acta Technica CSAV (Ceskoslovensk Akademie Ved)*, vol. 62, no. 2, pp. 1–13, 2017.

[10] A. Herison, Y. Romdania, A. Zakaria, and S. Kusuma, "Design and implementation of WebGIS marine ecotourism area, tegal island, lampung Province," *Jurnal SPATIAL Wahana Komunikasi dan Informasi Geografi*, vol. 19, no. 2, pp. 27–43, 2019.

[11] M. Tawfik, "The development of sustainable ecotourism in protected area, case study: siwa Oasis," *International Journal of Sustainable Development and Planning*, vol. 11, no. 3, pp. 334–344, 2016.

[12] S. Ambarita, M. Basyuni, N. Sulistiyono et al., "Landscape planning and economic valuation of mangrove ecotourism using GIS and Google Earth image," *Journal of Theoretical and Applied Information Technology*, vol. 96, no. 19, pp. 6306–6315, 2018.

[13] B. Douangphosy, "Community-based ecotourism for assessment potential and planning at phou khao khouay national protected area, Lao PDR," *International Journal of Sciences*, vol. 1, no. 03, pp. 1–8, 2015.

[14] G. González-Guerrero, A. K Olivares Robles, M. E Valdez Pérez, R. Morales Ibarra, and T. Castañeda Martínez, "The application of the tourist carrying capacity technique and its critical analysis for tourism planning," *Tourism Planning & Development*, vol. 13, no. 1, pp. 72–87, 2016.

[15] B. Fornal-Pieniak and A. Długoński, "Landscape valuation for planning ecotourism trails - case study," *Annals of Warsaw University of Life Sciences - SGGW. Land Reclamation*, vol. 50, no. 3, pp. 251–262, 2018.

[16] A. Auesriwong, A. Nilnoppakun, and W. Parawech, "Integrative participatory community-based ecotourism at sangkhom district, nong khai Province, Thailand," *Procedia Economics and Finance*, vol. 23, no. 4, pp. 778–782, 2015.

[17] M. Salemi, S. A. Jozi, S. Malmasi, and S. Rezaian, "A new model of ecological carrying capacity for developing ecotourism in the protected area of the north karkheh, Iran," *Journal of the Indian Society of Remote Sensing*, vol. 47, no. 11, pp. 1937–1947, 2019.

[18] S. Pourebrahim and S. Amoushahi, "Land quality management for ecotourism development; case of mahallat district," *Annual Research & Review in Biology*, vol. 16, no. 1, pp. 1–11, 2017.

[19] C. Zanamwe, E. Gandiwa, N. Muboko, O. L. Kupika, and B. B Mukamuri, "An analysis of the status of ecotourism and related developments in the Zimbabwe's component of the great limpopo transfrontier conservation area," *Sustainability in Environment*, vol. 5, no. 2, p. p14, 2020.

[20] P. Jokar, M. Masoudi, S. R. F. Shamsi, and S. F. Afzali, "Developing a model for ecological capability evaluation of ecotourism (A case study: jahrom township, Iran)," *International Journal of Scientific Research in Environmental Sciences*, vol. 3, no. 1, pp. 1–8, 2015.

[21] D. Hertati, "Development of community-based ecotourism of mangrove forest in wonorejo, surabaya," *Prosiding Semnasfi*, vol. 1, no. 1, p. 142, 2018.

[22] A. Salici, "Application of ecotourism opportunities spectrum method in ecotourism resources: a case study of samandağ coastal areas in southern Turkey," *Applied Ecology and Environmental Research*, vol. 16, no. 3, pp. 2701–2715, 2018.

[23] L. Ramandei and A. Bimantara, "Strategies for developing mangrove ecotourism based on its potential in the coastal area of kampung tobati, jayapura," *International Journal of Advanced Science and Technology*, vol. 29, no. 4, pp. 9868–9883, 2020.

[24] M. Rahayu, B. N. Hidayah, and B. N. Hidayah, "Ecotourism at nuraksa forest park area of west lombok - Indonesia," *Journal of Advanced Agricultural Technologies*, vol. 5, no. 1, pp. 52–57, 2018.

[25] A. Šiljeg, B. Cavrić, S. Šiljeg, I. Marić, and M. Barada, "Land suitability zoning for ecotourism planning and development of Dikgatlhong Dam, Botswana," *Geographica Pannonica*, vol. 23, no. 2, pp. 76–86, 2019.