

Natural Environment and Sustainable Development of Rural Tourism Based on Deep Learning

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Abstract: With the government increasing its support for rural tourism, rural tourism areas have emerged in the country. The rapid development of rural tourism market inevitably shows the fierce competition among rural tourism destinations. It is the direction of rural tourism development to establish a marketing concept that conforms to the modern commercial marketing application and the current view of rural tourists. This is conducive to the integration of tourism resources and the sustainable development of rural tourism. Based on this, this paper first puts forward the ecological environment problems of rural tourism, focusing on solid pollution, serious water pollution, vegetation, soil and human landscape damage, and discusses the effective measures for rural tourism ecological protection. This paper puts forward the innovative analysis of rural tourism marketing strategy, and uses deep learning algorithm to strengthen environmental protection and improve rural tourism marketing strategy. Through comparison, it can be seen that the perfection of the service system after the new rural tourism marketing strategy is 41.4% higher than that before the prevention and control, and the tourist attraction is 25.2% higher than that before the prevention and control. After using the new rural tourism marketing strategy, the solid pollution treatment rate is 0.25 higher than that of the traditional monitoring system, and the resource protection degree is 0.32 higher than that of the traditional system.

1. Introduction

The pioneer of rural tourism marketing is innovation. Rural tourism should update its strategy, change its marketing mode, and increase its market share on the basis of traditional marketing mode. Rural tourism marketing concept should keep pace with the times, adapt to market demand, and change its marketing concept under the market background. While changing the traditional marketing concept, it should integrate the economic concept into the tourism marketing concept.

When managing rural tourism, it should pay attention to environmental protection, introduce ecological concepts into the rural tourism market, and coordinate environmental protection and tourism development.

Natural protection of the environment has an important impact on rural tourism. Madanaguli Arun identified the main participants in the innovation ecosystem, as well as the support and obstacles of stakeholders to the ecosystem [1]. Kumar Suneel's research results have raised people's awareness of the appropriate ways to develop rural tourism and provided important information for formulating flexible rural tourism development strategies [2]. Chi Xiaoting learned about rural tourism destination and its impact on destination image and prediction satisfaction. Research shows that the higher-order structure of rural tourism performance has a significant positive impact on the responsiveness structure [3]. Chi Xiaoting learned about rural tourism destination and its impact on destination image and predicted satisfaction, indicating that rural tourism performance has a significant impact on rural income structure [3]. Vaishar Antonin discussed the impact of the COVID-19 on rural tourism, and found that the decline in tourism was mainly related to tourism oriented urban destinations [4]. Wijijayanti Trisetia uses descriptive qualitative techniques and uses purposive and accidental sampling to select the population. It can be expected that the sample villages have very distinctive characteristics and potential tourist destinations [5]. Ma Xiaolong described the revision of the sustainable livelihood framework and reported the impact of culture on the sustainable livelihood of families in a typical rural tourist attraction [6]. The above studies have described rural tourism, but there are still some deficiencies in the study of natural protection environment.

Many scholars have analyzed and studied the nature protection environment. Molinario Erica believes that the discovery of ecological activism is defined as a series of complex ecological behaviors, which is analyzed in the conceptual framework of semantic research theory [7]. Stelmasiak Jerzy believes that natural reserves are the regional legal form of natural protection. It is established in the form of local laws issued by the Regional Director of Environmental Protection, and its legal effect is to introduce appropriate legal systems in the form of prohibitions permitted by law [8]. Kostenko M A proposed that the main purpose of extending the "intelligent" national regulatory concept to the environmental field is to protect nature for future generations. Special status in solving environmental sustainability and environmental protection issues Natural management is a legal means, and the formulation of norms in this field should go beyond nature [9]. Soyapi Caiphaz B reviewed how the Environment and Land Court applied the right to a clean and healthy environment and implemented the requirements of the Constitution on environmental impact assessment in its ruling [10]. Abdullah Mohammad Syafiq investigated different religious traditions and their relationship with the concept of environmental protection rooted in the major religions in Malaysia. It is suggested that the Malaysian government should incorporate religious factors into the environmental policy for fostering pro-environmental behavior. Main media for raising environmental awareness [11]. Lin Mofei proposed a sponge city planning method based on the separation of natural ecological environment functions. According to the demand analysis of sponge construction, the natural ecological functions of sponge are divided into geological safety and water safety [12]. The above studies have described the nature protection of the environment, but there are still some deficiencies in the analysis of rural tourism marketing strategies.

In order to understand the specific development of rural tourism marketing strategies, this paper analyzes the risks existing in the ecological environment of rural tourism, puts forward effective measures for rural tourism ecological protection, and then analyzes the innovation of rural tourism marketing strategies, using in-depth learning algorithm to strengthen environmental protection and improve rural tourism marketing strategies, so as to better deepen the reform of rural tourism marketing strategies. Compared with the current rural tourism marketing strategy, the use of deep

learning algorithm to build a new rural tourism marketing strategy is more perfect and conducive to building a more complete marketing system.

2. Ecological Environment of Rural Tourism

2.1. Serious Solid Pollution and Water Pollution

In the development of rural tourism, construction and residents' life, a large amount of solid waste is often produced. If it is not treated in a timely and effective manner, it may cause environmental pollution. Rural tourism solid waste can be divided into inorganic waste and organic waste. Inorganic waste refers to the waste produced by enterprise producers and tourists. Organic waste refers to the leftovers produced by tourists in the process of accommodation and catering. If these solid wastes are not cleaned up in time, bacteria would inevitably grow, especially the smell of spring and summer would cause mosquitoes and flies, seriously damage the ecological environment, and bring bad tourism experience to tourists.

The rural tourism development zone generally has a good ecological environment. There are rivers and lakes in the area to attract tourists, providing tourists with good sensory experience. The hotel provides convenient viewing and leisure experience for tourists, and provides tourist facilities such as game rooms. For convenience, some companies often discharge wastewater into the lake without treatment. Over time, water pollution is serious, especially in areas with rapid development of rural tourism. With the increase of water pollution, the color and smell of water have affected aquatic plants to varying degrees, and the tourism environment and living conditions of rural residents have also indirectly deteriorated, as shown in Figure 1.

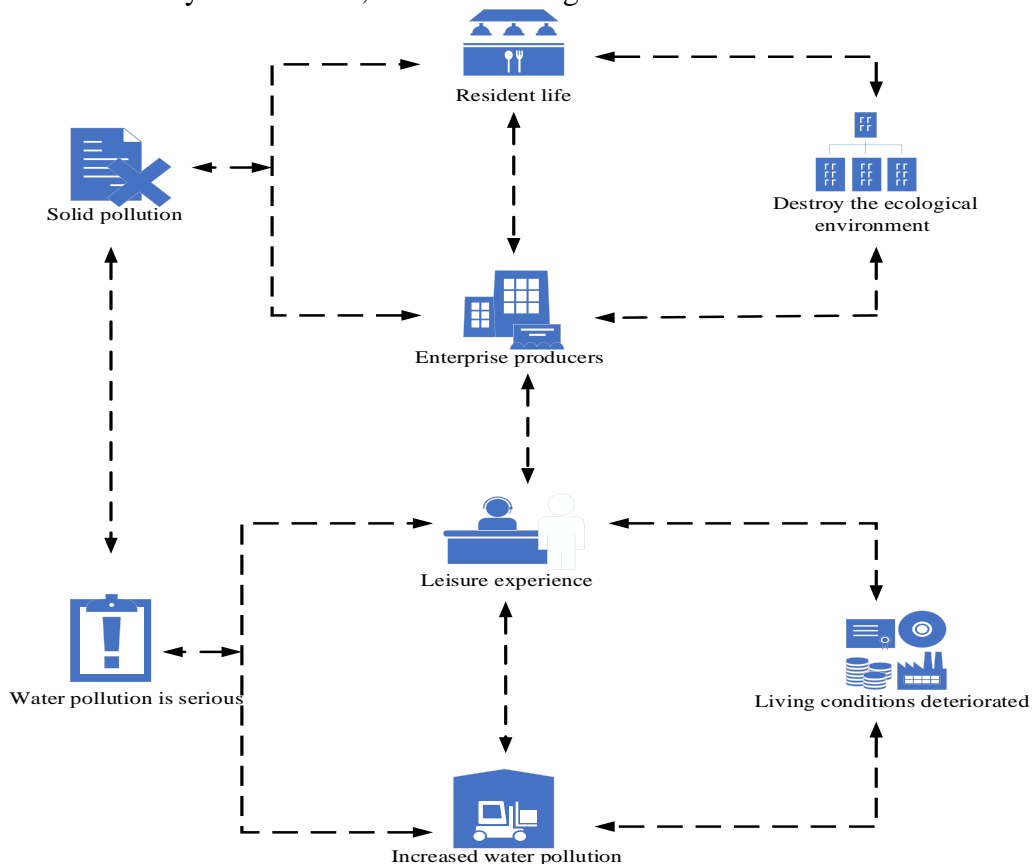


Figure 1. Solid pollution and water pollution are serious

2.2. Damage to Vegetation, Soil and Cultural Landscape

With the rapid development of rural tourism, many urban residents come to the countryside to experience life, breathe fresh rural air and have a pure heart, while some unskilled tourists only pay attention to their feelings, trample on the land and vegetation repeatedly, causing serious damage to the vegetation and soil. Some of these plant reserves are open to tourists, and natural vegetation areas are also directly affected by human beings. Because it is not fully protected, it has become a victim of people's enjoyment, and has been trampled by tourists, resulting in the normal growth of vegetation. In the development of rural tourism, in the face of the rich economic benefits of tourism, due to the limitations of its own educational level and the lack of government management, excessive commercialization has changed the interests of rural life, and has become farther and farther away from the purpose of rural tourism. It has lost the original simplicity and purity of the countryside, and has gradually become a slave of money. The attraction to urban residents is like a city with a rural "hat". Of course, it also greatly reduces the attraction. The development potential of rural tourism depends on the ability of entrepreneurs to make sustainable use of local material and intangible resources [13].

3. Effective Measures for Ecological Protection of Rural Tourism

3.1. Improve Solid Waste Treatment Capacity

In the past, rural waste treatment was basically self-purification. With the continuous development of rural tourism, the amount of solid waste has increased, far exceeding the capacity of ecological self-purification. Effective disposal of solid pollutants needs to improve the capacity of waste treatment. The number of scenic garbage bins should be increased, and the solid waste in rural scenic areas with taxonomic functions should be treated by centralized classification. Sufficient garbage bins should be equipped to cover the ecological perishable, seriously polluted and non-degradable river waste, which can be reasonably disposed by incineration and mining. Solid waste treatment should focus on waste recovery as much as possible, including useful waste such as fertilizer, energy, feed and materials. In terms of treatment, after collecting straw, biogas fermentation tank is used as fuel, microbial treatment technology is adopted, affordable materials are extracted from waste as feed, and civilized warning signals are set. The ecological construction of the scenic spot is based on the strength of the residents. Civilized warning signs are set up in the relevant places of the scenic spot to encourage tourists to consciously throw garbage into the garbage bin, and the sustainable development of the natural environment must be promoted.

3.2. Pay Attention to Water Environment and Vegetation Protection

Water pollution is very common in rural tourism. Relevant departments should actively strengthen water quality monitoring and effectively treat wastewater after sewage discharge. Domestic sewage and rainwater in rural scenic areas are divided into rainwater and wastewater in different landscapes. Domestic sewage is collected and treated in a centralized manner. Enterprises are prohibited from directly discharging biological wastewater into rivers, causing water pollution. In addition, the protection of water areas in the area should be strengthened, and the monitoring of marsh activities that have a significant impact on water quality should be strengthened, and residents should be encouraged to make rational use of water resources and drainage, so as to improve the protection efficiency of wetland environment. In order to protect water resources, reduce erosion and protect forests, large areas of deciduous trees and flowering shrubs should also be planted in coastal areas with large slope changes. Large trees with beautiful shapes should be

planted on both sides of the main tourist roads in the countryside, and flowering shrubs should be properly planted as decorations, in order to provide tourists with a good visual experience. The bushes and branches of trees are mixed into a beautiful green corridor, which can become a unique and beautiful landscape, as shown in Figure 2. In addition, vegetation protection should be done well to avoid being trampled by tourists and promote sustainable development.

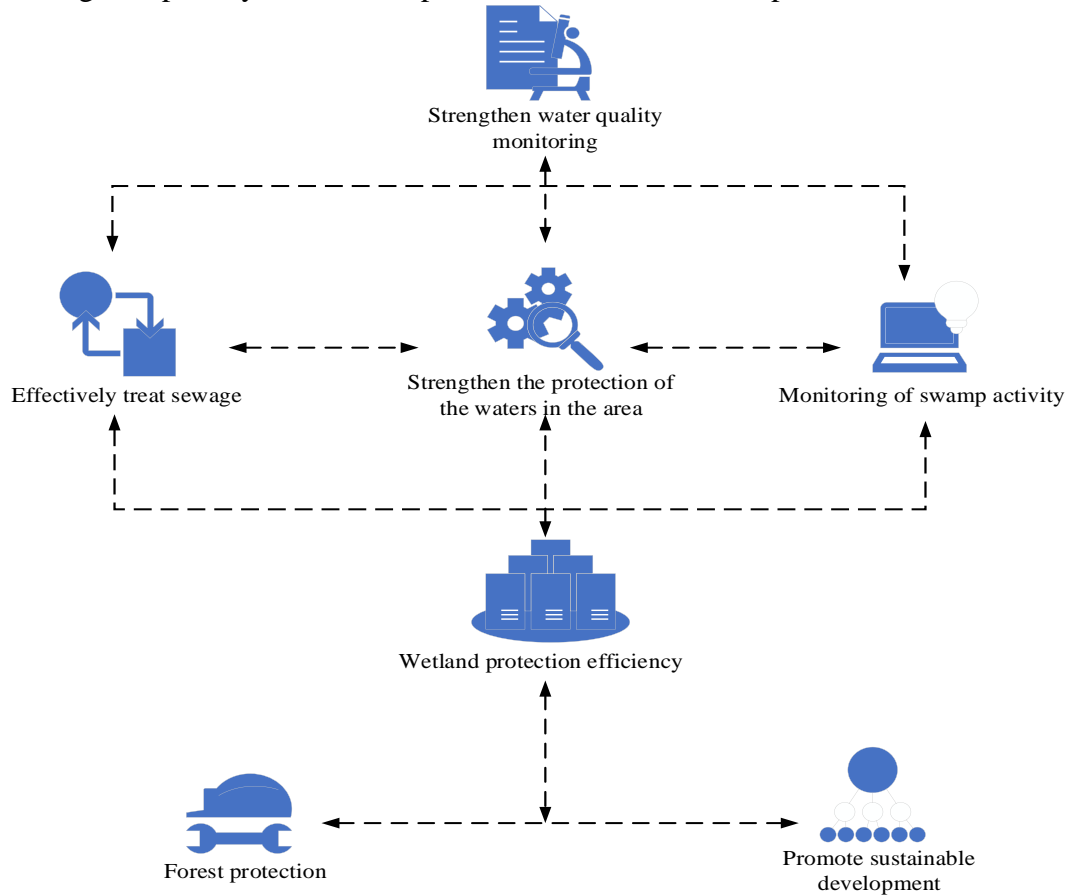


Figure 2. Pay attention to water environment and vegetation protection

3.3. Strengthen the Protection of Cultural Landscape

The protection of local characteristics has always been the focus of national attention, and is also an important part of the inheritance and continuation of excellent traditional culture. In view of the increasing importance of intangible cultural heritage, the government should excavate and protect folk art, strengthen the protection of cultural landscapes, and emphasize the particularity of rural areas.

4. Rural Tourism Marketing Strategy Innovation

4.1. Strengthen Government Guidance

In the context of the vigorous development of rural tourism, government departments should actively promote the development of rural tourism. The government should support and guide the smart rural tourism strategy and establish a diversified rural tourism service system. Emphasize the cooperation between the government and the tourism industry, establish the monitoring procedure

that the tourism industry should actively participate in, develop the leadership of the government association, actively carry out the planned rural tourism intelligent management activities, and jointly carry out the rural tourism marketing activities by the Ministry of Public Security of the region, health, industry and commerce, transportation, quality control and other departments, pay attention to the professional management of rural tourism personnel, and support the local rural tourism modernization construction; Transform enterprise management into process management, strengthen process supervision, and deepen the leading role of ministries and departments in rural tourism marketing; Accelerate the development of rural tourism, respect the leadership of government departments, innovate and share green, clarify the concept of coordinated development, strengthen the coordination function of government departments, make full use of existing resources, and create rural landscape; Develop customs, vigorously develop local culture and other tourism projects, give full play to the comprehensive advantages of scenic spots, promote regional economic development, and become a green industry to develop rural economy with characteristics. Rural areas may benefit from the entrepreneurial motivation created by small tourism enterprises, especially if it is related to the lifestyle motivation of their entrepreneurs [14]. The government and travel agencies are actively committed to building rural tourism clusters with local characteristics, strengthening the culture of rural towns and tourism villages, steadily promoting the construction of beautiful villages, and successfully building rural leisure areas, as shown in Figure 3.

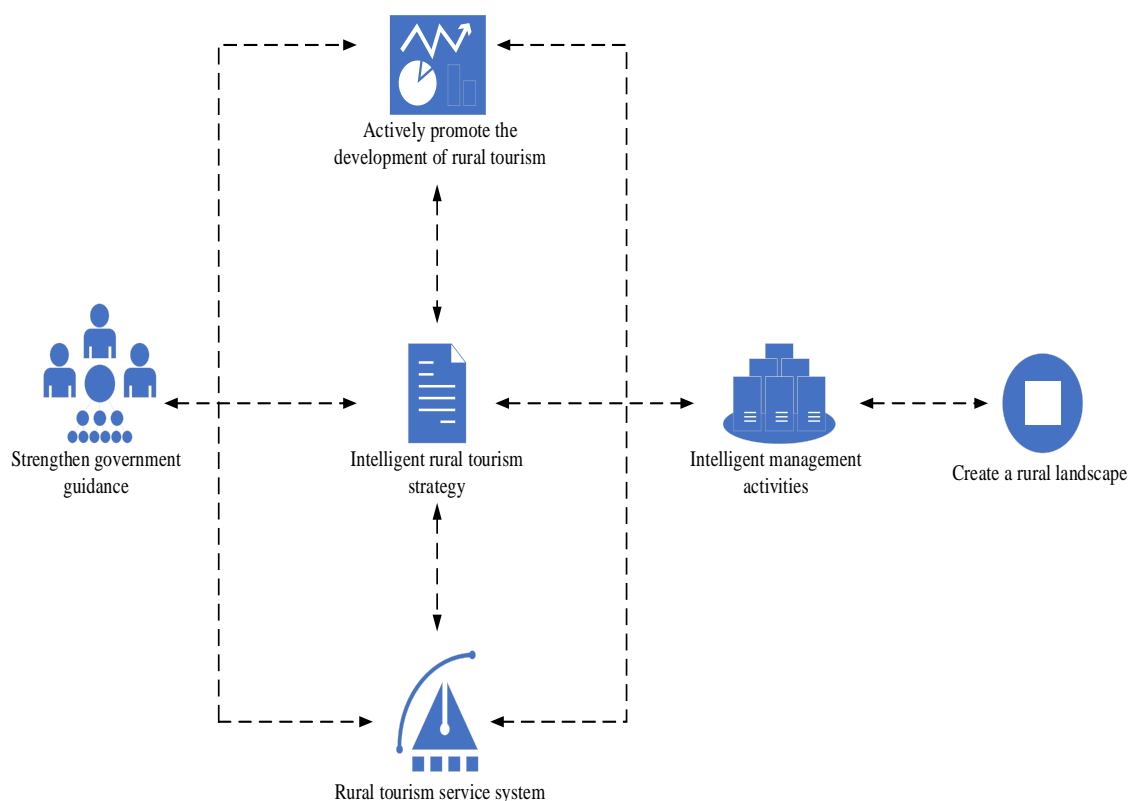


Figure 3. Strengthen government guidance

4.2. Actively Expand Marketing Channels

Actively promote tourism products, enhance the market influence in the era of product diversification, take effective measures to build tourism brands according to the specific conditions of rural tourism, increase efforts to promote the characteristics of rural tourism products, promote

tourism products through the network, and build rural tourism marketing channels. Carry out scenic protection activities, promote rural tourism culture, make consumer groups closer to tourism products, actively promote tourism culture, improve the understanding and mastery of rural tourism products, form a comprehensive marketing chain of rural tourism, standardize the marketing behavior of tourism products, increase the sales of tourism products through mass media, understand the psychology of high tourists, and analyze the potential consumption behavior of tourists from the perspective of tourists' needs, Stimulate tourists' excitement about high-quality tourism products. Build characteristic areas, vigorously develop tourism, and provide innovative rural tourism projects for tourists. With the passage of time, tourists can enjoy the idyllic scenery freely. It should feel the charm of landscape and natural characteristics, return to nature and experience more rural life.

5. Deep Learning Algorithm to Strengthen the Environmental Protection and Rural Tourism Marketing Strategy Improvement

Assume that there are n rural tourism attractions, build a network of attractions according to the strategic planning, and R sample (α_i, β_i) of marketing programs, including:

$$\alpha_i = [\alpha_{i1}, \alpha_{i2}, \dots, \alpha_{in}]^T \in R^n, \beta_i = [\beta_{i1}, \beta_{i2}, \dots, \beta_{im}]^T \in R^m \quad (1)$$

The goal of a single hidden layer network system is to minimize the output error, which can be expressed as:

$$\sum_{i=1}^N \|p_j - \beta_j\| = 0 \quad (2)$$

Namely, there are β_i, h_i and b_i , so that:

$$\sum_{i=1}^N (h_i \cdot \alpha_i + b_i) = \beta_j, j = 1, \dots, N \quad (3)$$

$$F\alpha = T \quad (4)$$

6. Deep Learning Algorithm and Experimental Investigation

In order to study the specific effect of rural tourism marketing strategy in the actual application under the natural protection environment, this paper analyzes the perfection of the service system and the attraction of tourists in the rural tourism marketing strategy, constructs a new rural tourism marketing strategy using the deep learning algorithm, and then analyzes the perfection of the service system and the attraction of tourists in the new rural tourism marketing strategy. First of all, this paper surveys the perfection of the service system and tourist attraction in the rural tourism marketing strategies of the three regions, and compares them with the indicators of the traditional rural tourism marketing strategies. The specific survey is shown in Table 1.

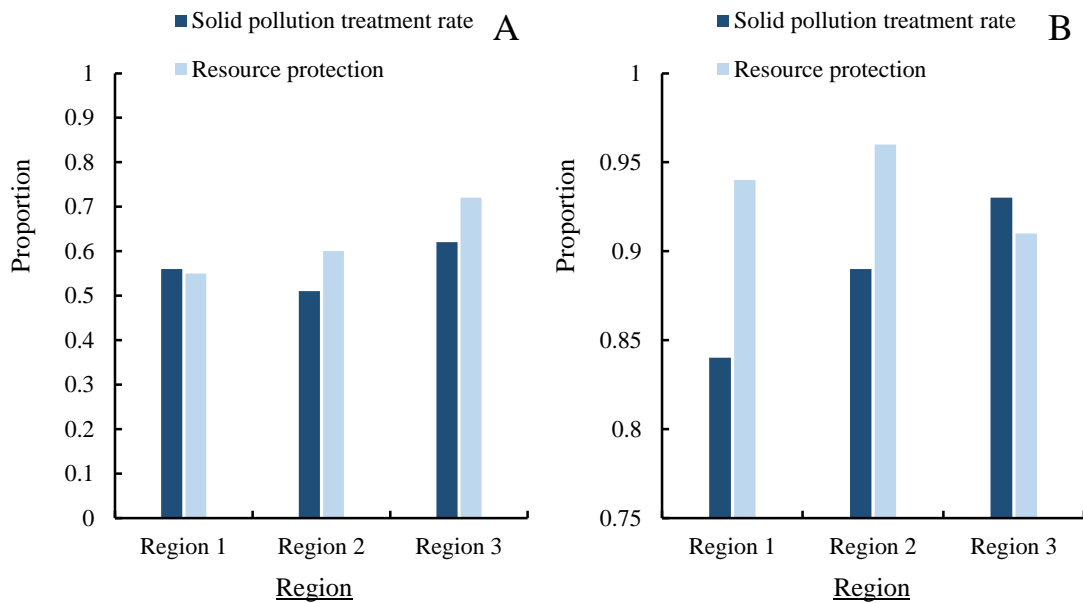
According to the data in Table 1, under the traditional rural tourism marketing strategy, the perfection degree of the service system in Region 1 is 48.6%, the tourist attraction is 70.1%, the perfection degree of the service system in Region 2 is 47.5%, and the tourist attraction is 74.6%. The service system in Region 3 is 51.3% complete and the tourist attraction is 68.3%. After taking advantage of the new rural tourism marketing strategy, the service system of Region 1 is 91.6% complete and the tourist attraction is 94.8%. The completeness of the service system in Region 2 is 88.4%, and the tourist attraction is 96.5%. The service system of Region 3 is 92.1% complete and

tourist attraction is 97.2%. Under the traditional rural tourism marketing strategy, the average perfection of the service system is 49.1%, and the average tourist attraction is 71.0%. After using the new rural tourism marketing strategy, the average degree of service system perfection is 90.7%, and the average tourist attraction is 96.2%. Through comparison, it can be seen that the perfection of the service system after the new rural tourism marketing strategy is 41.4% higher than that before the prevention and control, and the tourist attraction is 25.2% higher than that before the prevention and control.

Table 1. Traditional and new rural tourism marketing strategy of the service system perfection and tourist attraction

	Improvement of the service system		Attraction of tourists	
	Traditional strategy	New strategy	Traditional strategy	New strategy
Region 1	48.6%	91.6%	70.1%	94.8%
Region 2	47.5%	88.4%	74.6%	96.5%
Region 3	51.3%	92.1%	68.3%	97.2%

Analyze the natural environment protection of the three regions after using the traditional and new rural tourism marketing strategies, and investigate the solid pollution treatment rate and resource protection degree. The specific investigation results are shown in Figure 4.



A: Natural environment protection situation after the traditional rural tourism marketing strategy

B: Natural environment protection situation after the new rural tourism marketing strategy

Figure 4. Natural environment protection status after the traditional and new rural tourism marketing strategies

Figure 4a shows the traditional rural tourism marketing strategy, and Figure 4b shows the new rural tourism marketing strategy. According to Figure 4a, after using the traditional rural tourism marketing strategy, the solid pollution treatment rate of area 1 is 0.56, and the resource protection degree is 0.55; The solid pollution treatment rate of area 2 is 0.51, and the resource protection

degree is 0.60; The solid pollution treatment rate of area 3 is 0.62, and the resource protection degree is 0.72. It can be seen from Figure 4b that after using the new rural tourism marketing strategy, the solid pollution treatment rate of area 1 is 0.84, and the resource protection degree is 0.94; The solid pollution treatment rate of area 2 is 0.89, and the resource protection degree is 0.96; The solid pollution treatment rate of area 3 is 0.93, and the resource protection degree is 0.91. Through comparison, it can be seen that the solid pollution treatment rate after using the new rural tourism marketing strategy is 0.25 higher than that before the traditional monitoring system, and the resource protection degree is 0.32 higher than that of the traditional system.

7. Conclusion

With the rapid development of tourism, rural tourism has also undergone some changes. Establishing a good rural tourism marketing model can effectively improve the competitiveness of rural tourism, which is a prerequisite for the development of rural tourism. However, there is no unified standard and unified marketing planning model for the development of rural tourism. In order to better develop the tourism industry, it is necessary to establish a good marketing model. Compared with general marketing, tourism marketing has its special laws. To a certain extent, marketing is more important for tourism than other industries. Rural tourism marketing plays an increasingly important role in the future tourism development.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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