Construction and Application of Beautiful Rural Landscape Evaluation Model Using Computer Eye Tracking Technology

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Abstract. First of all, the relevant personnel should fully integrate the local customs and culture when constructing the rural landscape, and they should design a more beautiful rural landscape while retaining the traditional core culture of the village. Secondly, through the evaluation system, we can understand people's thoughts and needs effectively, this can add design ideas for building a more beautiful rural landscape.

Keywords: Landscape, Ecology, Rural Area, Evaluation

1. Introduction

With the advancement of rural construction and the change of rural residents’ life concepts, people are no longer satisfied with the existing housing conditions, the requirements of the living environment are getting higher and higher. Ecological rural landscape construction not only needs to embody economic and aesthetic landscapes, but also requires humanistic features. Rural landscape is a combination of rural natural landscape and traditional human landscape. Compared with cities, rural areas are less disturbed by human activities. It contains rich landscape elements, this is conducive to maintaining the balance of the landscape ecosystem.

2. Research status at home and abroad

The success of the industrial revolution has promoted the progress of human technology and civilization, and the level of human productivity has been unprecedentedly improved. With the development of energy and industry, the living environment of mankind has been greatly destroyed, which has greatly affected the distance from the city. In rural areas, the construction and development of rural areas has also threatened the rural ecological environment. Facing this situation, domestic and foreign countries have adopted certain measures and solutions. As early as the 1930s, the United States paid attention to
the conservation of water and soil in agricultural production, the rational development and utilization of arable land, and the avoidance of soil erosion caused by industrial production, and formulated relevant policies. In 1962, the European and American Common Agricultural Policy was a policy on agricultural production and agriculture [1]. Environmental development plays the most important role in the promotion and protection of policies. This policy attaches importance to the ecological construction of rural landscapes, and proposes the protection of biodiversity in the development of rural landscapes, the construction of multi-functional rural landscapes, and the management of water resources in rural rivers and lakes; In 1964, the "Wild Land Act" passed by the US Congress proposed the importance of developing rural landscapes and enacted laws to protect rural landscapes. In the 1960s, Sweden, Denmark, the United Kingdom and other European countries proposed to combine ecology and rural landscape construction, and set up special research institutions to form a systematic theory and method system; in the 1970s, South Korea launched the "New Countryside" campaign to target urban construction The expansion of the phenomenon that affects rural land puts forward relevant solutions, which effectively solves the problem of urban and rural land competition, and promotes the development of rural ecological landscape; in 1974, Born, Germany, reported in "The Development of German Rural Landscape" It puts forward in detail the relationship between population, land and culture in rural landscape construction, which has important practical significance for the development of rural ecological landscape. In 1994, the US Natural Resources Conservation Service. Attach importance to improving the production and living environment of rural residents, and propose ecological rural landscape construction and the development of rural tourism resources. The rural development plan formulated by the European Union in 2005 proposed a 6-year (2007-2013) rural development strategy goal, which includes improving the economic value of agriculture, developing rural ecological landscapes and tourism [2].

Our country’s research on rural landscape is based on the research of rural geography. It analyzes the forming factors of rural landscape and combines ecology to gradually form a systematic rural landscape research system. Domestic Wang Yuncai, Liu Binyi and others have made plans and designs on rural landscape, Rural landscape ecological research, research on the development of rural tourism, providing theoretical guidance and practical reference for improving the rural environment and building a harmonious ecological rural landscape. In the 1990s, my country combined with the study of rural settlements and put forward relevant measures for ecological protection in rural landscape construction; Tang Guoan, Yu Miao and others used RS and GIS technology to select some rural areas in Yulin, Shaanxi and Hengren County, Liaoning as the research objects for landscape pattern analysis And put forward new concepts such as the form of rural settlements. Ding Wei and others established an evaluation model by calculating the causes and indicators in the rural landscape.

3. Problems in rural landscape construction

Although rural construction has improved the living conditions of rural residents, there are still many problems in the construction process. In the process of rural construction, the so-called image project is often paid more attention to. The original natural and cultural landscapes formed in the countryside for thousands of years are discarded or directly demolished, thinking that these "old" things have completely failed to keep up with the rhythm of the times. Instead, the same "modernization" construction model has emerged. The so-called "urbanization" in the countryside has appeared. The large squares and even
fountains in the cities have been moved to the countryside. During the construction process, large-scale demolition and construction have seriously damaged the ecology of the rural landscape. Balance [3].

3.1. Lack of reasonable planning

At present, the form of rural villages in my country is relatively scattered, and the planning of rural landscapes is also restricted to a certain extent. In the construction of new rural areas, relatively more attention is paid to the improvement of rural residents' housing conditions, and there is a lack of reasonable and unified planning for rural landscapes. In particular, incomplete planning and design of water supply and drainage, garbage disposal, and separation of industrial pollution have resulted in frequent cross-flow of sewage on rural roads, random dumping of garbage, and serious industrial pollution that seriously affect the rural environment [4]. In addition, the large-scale use of large-scale machinery in agricultural production and the excessive application of chemical fertilizers and pesticides have caused serious threats to rural species. German research on rural landscapes has found that unreasonable agricultural production planning is the most important factor leading to species extinction (see figure 1).

![Figure 1. The number and reasons of the frequent species studied in Germany](image)

3.2. Destroy the natural landscape

As an important national project for people’s livelihood, the construction of new rural areas has not been properly interpreted. The implementation process is more focused on face projects and economic benefits, and the development and utilization of rural resources is not reasonable enough for the so-called "scale" and "Modernization" often destroys forests and fills lakes, and the original streams, ponds, farmland, characteristic natural vegetation, and natural topography in rural areas have been destroyed to varying degrees [5]. During the construction process, these naturally formed rural landscape elements were not rationalized. The excavation and utilization of the natural or semi-natural landscapes in the rural areas gradually disappeared, replaced by rigid modern landscape buildings, large squares, hardened roads, etc., which seriously affected the ecological structure of the rural landscape.

3.3. Ignore the cultural landscape
my country's rural cultural system has obvious regional characteristics. The rural areas are full of rich human cultural heritage, which is the embodiment of human civilization in a certain region and a certain historical period. In the construction of new countryside, the development and utilization of existing ancient wells, ancient trees, ancient streets, and ancient buildings are often neglected. During construction, sites are often re-selected, and these cultural landscapes with strong cultural heritage are discarded or destroyed, causing The serious lack of humanistic care in the rural landscape [6].

4. Construction method of rural ecological landscape

The ecological construction of rural landscape is an urgent requirement for the construction of new countryside. A reasonable rural ecological landscape planning should not only exert the aesthetic function of the rural landscape, but also design a more ecological agricultural system in accordance with the requirements of ecological laws by using abundant agricultural resources. Its social production capacity allows the rural landscape to exert greater social benefits, and on this basis ensures the sustainability of the rural landscape development (see Figure 2).

![Figure 2. Schematic diagram of rural landscape functions](image)

4.1. Improve the landscape structure design

There are abundant species in rural ecosystems and frequent human production activities, and more interventions on species have led to instability of the rural landscape structure. Therefore, in order to realize the ecological rural landscape, it is necessary to improve the unreasonable landscape structure and carry out scientific configuration through the planning and design of the ecological model. Ecological agriculture is an important component of the rural landscape, and it is also the main factor that affects the ecology of the landscape. The characteristics of crops should be fully utilized in conjunction with the rational allocation of landscape space to achieve the ecological balance of the rural agricultural landscape. At the same time, the rural wetland ecosystem and lake ecosystem should be scientifically configured to achieve the coordinated development of aquaculture and natural water protection. Eventually an ecological environment where agricultural production and rural landscape coexist.
4.2. Maintain the integrity of the rural landscape

Maintaining the ecological diversity in the rural environment is of great significance to the establishment of a healthy rural ecological landscape. The ecological diversity is conducive to the initiative of environmental self-regulation. Therefore, attention should be paid to protecting the integrity of the existing natural landscapes in rural areas, and at the same time, artificial interventions should be made to the damaged ecosystems, through the cultivation of species and the rational configuration of structures, to restore them, while protecting the integrity of the rural landscapes [7]. The diversity of rural landscapes should be realized, and an ecological landscape environment with abundant species and strong self-healing characteristics should be realized.

4.3. Strengthen corridor construction

In the ecological construction of rural landscapes, corridors play a specific role in protecting the ecosystem. Ecological corridors are the boundary between the healthy transition of humans and the natural environment. They have a close relationship with the marginal species, internal species and species diversity on both sides of the corridor, relationship. Linear corridors, strip corridors, and river corridors should be used in combination with actual conditions to effectively penetrate the rural landscape, and the relationship between corridors and edge effects should be handled (see Figure 3), not only using the aesthetic function of the corridor, but also The habitat function, filtering function, and transmission function of the corridor should be used to give full play to the ecological function of the corridor, use its ecological function to alleviate the pollution caused by human production and life to the natural environment, and effectively maintain the ecological balance of the rural landscape [8].

![Figure 3. The relationship between corridor width and edge effect](image)

4.4. Pay attention to the role of plaque

Patches are a common structural feature in the landscape. Most of the rural landscape elements are presented in the form of patches. The size and shape of the patches will affect the ecological functions of the rural landscape. The size of the patches reflects the species diversity of the rural landscape, The shape of the patch reflects the stability and migration state of the species. Therefore, in rural landscape planning and construction, attention should be paid to the feedback effect of patches and the uniformity of patches. For example, combining agricultural production patches and rural tourism patches to form an ecological rural landscape with new rural characteristics.

4.5. Persist in sustainable development
There are rich rural cultures in the rural areas of our country. These cultures represent the crystallization of wisdom in different historical periods, long-term production, life and labor of different nationalities, and embody the aesthetic concept, value orientation and life outlook of rural residents with regional characteristics. The development of rural landscape construction should, on the basis of handling the relationship between human activities and the natural environment, attach importance to the close integration of rural cultural heritage and rural landscapes to create sustainable development that is both ecological and environmentally friendly and inherits traditional culture.

5. Functional evaluation of rural ecological landscape

The ecosystem in the rural landscape is a complex involving natural resources, society and economy. The development of the rural ecosystem is the evolution of the interaction of multiple factors. The establishment of an evaluation system that can fully reflect the ecological development of rural landscapes must take into account the influence of many factors such as hydrology, vegetation, climate, and geology. The selection of indicators in the evaluation system should reflect the characteristics of system factors, and the interrelationships between the indicators can fully reflect the social, ecological and aesthetic effects of the rural landscape.

5.1. Comprehensive evaluation index system

(1) Social productivity index: The agricultural landscape in the rural landscape has a certain social production function. It is the first level of the function of the rural landscape and provides the material needs for the basic production and life of mankind. This indicator should be evaluated from two aspects: unit quantity and total quantity. The total quantity index reflects the country's agricultural productivity level, and the unit quantity index feeds back the comprehensive production status of regional or various types of crops. At the same time, this indicator should also reflect the economic benefits of rural agricultural production, which should reflect the rural industrial structure and the rural residents' agricultural income [9].

(2) Ecological function index: This index mainly refers to the forest vegetation coverage rate, land use area rate, soil erosion rate, biodiversity, landscape fragmentation and other indicators to reflect the ecological stability of the rural landscape. Environmental improvement should be based on qualitative characteristics. At the same time, the rural landscape ecosystem should be further improved based on the current situation of agricultural production pollution, daily life pollution and non-agricultural pollution in the rural ecosystem.

(3) Aesthetic function indicator: A healthy rural ecological landscape should also reflect a certain aesthetic effect. This indicator mainly combines the development status of rural residents’ village layout, building density, green coverage, richness of scenic spots and historical sites, and artificial landscape proportions, and feedback The aesthetic effect of the rural landscape and the degree of social civilization.

5.2. Evaluation of ecological landscape pattern

The rural landscape is an overall landscape pattern formed by homogeneous elements and components. When evaluating the ecological nature of the rural landscape, the distribution of each element in the
landscape ecosystem should be fully considered, and the quantitative analysis should be carried out to understand the relationship between the elements. It is of great significance for coordinating the relationship between landscape structure and function to maintain ecological balance. There are many elements covered in the landscape pattern, and the actual situation is complicated. Here, indicators such as patch fragmentation, separation, diversity, and evenness that affect landscape ecological changes closely are selected for analysis.

6. Conclusion

In short, constructing a beautiful countryside is not only reflected on the beautification of the environment. The core is to create a rural ecological space with beautiful mountains and clear waters, and it should be suitable for people to live. Therefore, it is necessary to rationally plan the spatial layout. According to the perfect evaluation system, it will provide construction personnel with better plans, so that they can continue to create high-quality charming villages.

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