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THE IMPORTANCE OF LOW-CARBON LANDSCAPE DESIGN IN RURAL TOURISM LANDSCAPE

Abstract: The paper aims to study the importance of low-carbon landscape design based on rural tourism landscape. First of all, after sorting out and researching the relevant reviews of low-carbon landscapes, taking rural landscapes as the research object, a rural landscape planning and design framework based on the perspective of low-carbon construction is proposed. Then, Xiwuli Village is used as an example to carry out the application practice of specific strategies and the carbon emissions before and after the planning and design are calculated and compared. After the low-carbon planning and design of the rural landscape, the net carbon footprint and the total carbon footprint were significantly reduced, confirming the low-carbon effect of the planning and design strategy. Finally, according to the actual situation of the scenic spot, it points out the principles and policy suggestions that must be followed in the development of low-carbon rural tourism. Experiments show that: the net carbon footprint and total carbon footprint are significantly reduced, which proves the actual effect of low-carbon design and the effect of low-carbon planning and design strategy.

Keywords: low carbon, low carbon concept, low carbon construction, rural landscape, landscape design

Introduction

In recent years, with the continuous acceleration of the urbanisation process and the advancement of the construction of beautiful rural areas, the construction of beautiful rural landscapes has also been carried out in various places. This has played an important role in improving the appearance of the countryside and improving the quality of life of the villagers. At the same time, there are also many problems in the construction of beautiful rural landscapes. For example, the neglect of the regional characteristics and traditional cultural connotations of beautiful rural landscapes has led to the phenomenon of “one colour in a thousand villages” and blind imitation of foreign landscape culture. The one-sided pursuit of formal urbanisation has resulted in the destruction and destruction of the rural features that have survived for thousands of years. All these problems in the design will lead to the failure to inherit and develop the historical and cultural context of the beautiful countryside. The beautiful rural landscape, as an important carrier and "imprint" of inheriting the rural history and continuing the rural context, has gradually disappeared from people’s memory. Based on this background, how to inherit and develop the traditional cultural connotation of the countryside, maintain the character and integrity

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of the beautiful rural landscape, and improve the overall environmental quality of the beautiful countryside has become a problem to be solved.

For quite a long time, people unilaterally believed that tourism was a "smoke-free industry". Although the development of tourism has less energy consumption and less environmental pollution, in fact, the carbon emissions of the tourism industry are not zero emissions. Moreover, it seems that the carbon emissions of the tourism industry are very large, which means that the tourism industry still has a certain space for emission reduction. In turn, global climate change will also have a profound impact on the development of my country's tourism industry. Climate change has brought many uncertain factors to the development of tourism. Some people are still simply pursuing the growth of the number of tourists, ignoring the unity of economic, environmental and social benefits, adopting an extensive development model and simplifying the development of tourism to quantitative growth, which will inevitably hinder the sustainable development of tourism. Therefore, low-carbon tourism is the best choice for my country to deal with global climate change, and it is also an important part of my country's sustainable economic development.



Fig. 1. Rural tourism landscape design

The wave of low carbonisation is the fourth wave after the wave of informatisation, indicating that the era of low carbonisation is coming. As an industry with low energy consumption and low pollution, tourism is known as a "smoke-free industry", and tourism will be an advantageous industry for energy conservation and emission reduction. The development of tourism is closely related to the environment (Fig. 1). In a nutshell, the environment is the basic resource of a tourist destination and the basis and support for the development of tourism in that place [1]. Most tourism resources are part of the environment of the destination. Therefore, the environment of a tourist destination is the most basic element of the overall local tourism product composition, and it will be

an important determinant of attracting tourists to visit. Therefore, through the implementation and development of low-carbon tourism, carbon emissions and other pollutants will be reduced, and environmental protection will be promoted, and environmental protection will attract more tourists, which will definitely help my country's tourism industry. Development provides important opportunities for development.

From the perspective of experience and promotion value, the creation of low-carbon tourist attractions is a huge project. Today, there are no low-carbon tourist attractions in the mainland, and no low-carbon tourist cities. In this sense, low-carbon tourist attractions, like low-carbon cities, are also a brand-new city card [2]. By creating low-carbon tourist attractions, tourists can experience low-carbon life through tourism, promote low-carbon education, convey low-carbon concepts, and lay the foundation for building a low-carbon city. It can be said that low-carbon tourist attractions are a condensed version of low-carbon cities.

Literature review

At present, the research on low carbon in the international community mainly focuses on low carbon economy and low carbon city, and there are few studies on low carbon landscape construction. The concept of low carbon was first proposed in the construction of cities such as London and Paris. Reducing carbon dioxide emissions by controlling energy emissions reduces urban pollution and improves the urban environment to a certain extent. After that, low-carbon construction shifted from cities to villages, spread to all countries in the world, and developed to a certain extent. Neves and Haldenby [3] proposed that any landscape with a certain biomass has the ability to absorb carbon dioxide. Takagishi et al. [4] proposed specific measures to reduce carbon dioxide emissions from land use, architectural landscape and low-carbon transportation, and put forward certain theoretical methods for low-carbon landscape, which played an important role. Li et al. [5] believed that comparing the advantages and disadvantages of new recyclable materials and traditional building materials, and proposed the value and method of recycling and utilisation of different materials in the landscape, which is of great significance for the construction of energy-saving and low-carbon landscapes. Wang et al. [6] calculated the carbon footprint of vegetation in the whole life cycle from the carbon dioxide absorption capacity of plant communities, the carbon emissions of plants themselves, and the carbon emissions in the process of maintenance and management through the study of green space landscape, which is the basis for community green space plant communities. Guidance on carbon sequestration research. Fartmann et al. [7] explored and tried low-carbon landscapes, which focused on considering the impact of plants on climate and environment, and analysed the role of plants on low-carbon effects. Through the research on the carbon sequestration effect of plants, the emission of landscape has been effectively reduced. Yan et al. [8] summarised the current practical problems in rural landscape construction, and proposed that rural green space system is an important natural carbon sink in rural landscape and plays a key role in the reduction of rural carbon dioxide. They proposed to build a healthy and efficient rural green ecological network pattern, use the power of nature to restore and update the ecosystem, and enhance the "carbon sink" function of green space. By strengthening the recycling of materials and other resources in the process of rural landscape construction and reducing the carbon footprint of landscape construction, certain strategies have been proposed for the low-carbon construction of rural landscape

environment [9]. The low-carbon concept of Xinxiang Hedipu village planning and design, from the overall layout, road transportation, rural green space, energy, infrastructure and other aspects of low-carbon rural planning has been explored. It is proposed that the central setting of the public center can help solve the reduction of villagers' demand for motor vehicle traffic, thereby further reducing carbon dioxide emissions [10]. A method of combining public parking lots and parking spaces in residential courtyards with green landscapes and three-dimensional greening is proposed, and trees and hedges are planted to reduce carbon emissions. Through the construction of low-carbon housing and low-carbon industry to reduce the rural carbon dioxide emissions, and put forward the concept and method of low-carbon health, has a certain theoretical value [11]. It is necessary to monitor and track the carbon emission in each stage of landscape construction, and evaluate and analyse it based on the data, and take corresponding effective measures. It is concluded that by reducing the carbon emissions in garden construction, choosing low-carbon materials and technologies to reduce the carbon cost of garden maintenance, thereby increasing the "life cycle" of the landscape and reducing carbon emissions. Liu et al. [12] summarised the landscape evaluation system with carbon dioxide as the evaluation index, and proposed a comparison method of carbon source and carbon sink in the whole life cycle of landscape. Through examples, it is shown that effective low-carbon measures can reduce the carbon source in the landscape and increase the carbon sink in the landscape, which plays an important role in the quantitative research of landscape carbon emissions and is beneficial to the objectivity of the low-carbon landscape in the future.

Low carbon design of rural tourism landscape

Low carbon landscape and rural landscape

(1) Low carbon landscape

Low-carbon landscape is an emerging concept of landscape architecture, which combines the concept of low-carbon on the basis of landscape. To minimise the use of fossil energy, improve energy efficiency and reduce carbon dioxide emissions.

Low-carbon landscape is to apply the concept and method of "low-carbon" to landscape, that is, lower carbon emission in the whole process from landscape construction to later management of landscape. Compared with ordinary landscape construction, it is more environmentally friendly, energy-saving, has higher resource utilisation, less carbon emissions, causes the least damage to the natural environment, and maximises the protection of natural resources. It is a new concept in the low-carbon era. Low-carbon landscape is a product of the era of ecological civilisation, which conforms to the laws of natural development. It is a modern landscape with novel technology, low cost, healthy nature, and sustainable development. It is an effective way to solve the current greenhouse effect. For the deep connotation of low-carbon landscape, some scholars believe that low-carbon landscape must be resource-saving and environment-friendly. The concept of "low carbon" is applied to the field of landscape, scholars who study landscape combine sustainable development theory, landscape ecology theory, and combine various disciplines to conduct in-depth thinking, fully understand the meaning of "low carbon", and form the concept of low carbon landscape.

(2) Rural landscape

Rural landscape, as the name suggests, is relative to urban landscape, which refers to the comprehensive expression of human landscape and natural landscape formed in rural

areas due to the needs of production and life, and has multiple values. As a landscape type with a specific orientation, rural landscape is an artificial natural landscape. In terms of its connotation, rural landscape is a complex of rural settlement landscape, productive landscape and natural ecological landscape. From an aesthetic point of view, rural landscapes are more directed towards being scenic and ornamental. From a geographical point of view, rural landscapes are more territorial. From an ecological point of view, rural landscapes are represented by the size, quantity and complexity of patches, the richness of landscape components, and species diversity. It includes regional specificities and landscape types, but there are too many emphases on natural landscapes. Artificialisation refers to social landscape and productive landscape, while natural landscape refers to the features of nature itself. Therefore, on the one hand, the rural landscape is a natural attribute, and on the other hand, it also reflects the artificial attributes such as changes in the landscape pattern caused by human activities.

The plan and design of low carbon road traffic in rural areas

Rural low-carbon transportation is mainly to satisfy tourists' tours while minimising internal transportation energy consumption and carbon emissions. The low-carbon transportation can be realised mainly from three aspects: the choice of transportation mode, the construction of parking lot and the organisation of transportation routes.

(1) Low-carbon transportation in rural areas

Different modes of transport use different energy, which affects the carbon emissions of tourists using transport in the countryside. Comparing the amount of carbon dioxide emitted from energy consumption by different transportation modes, on the premise of not affecting travel, and taking into account the layout of the countryside, roads and other influencing factors, determine the transportation mode suitable for the countryside [12]. According to relevant data, the carbon dioxide emission coefficients of common energy sources are shown in Table 1.

Table 1

Carbon emission coefficients of common energy sources

Name of energy	Unit of measurement	Coefficient *K*	Converted to CO_2 units
Electrical energy	kWh	0.96	kg
Gas	kWh	0.24	kg
Gasoline	L	2.6	kg
Natural gas	m^3	2.165	kg
Coal	kg	1.975	kg
Diesel fuel	kg	3.1863	kg

Table 2

Carbon dioxide emissions from different transportation facilities

Type of transport	Actual energy consumption [L/km]	Fuel density [kg/L]	CO_2 emissions [kg]	Unit carbon dioxide emissions [kg/person]
Public transit	0.308	0.876	0.2704	0.0038
Private car	0.081	0.723	0.0600	0.013
Bus	0.246	0.876	0.2278	0.0053

The common means of transport for rural tourists are private cars, buses and public transport. The fuel consumption values of cars and buses currently on the market are shown in Table 2.

Table 2 shows that the per capita carbon dioxide emission per kilometer of private cars is significantly higher than that of buses and public transportation. Therefore, the use of public transport, such as electric sightseeing cars, should be encouraged in rural areas. In addition, bicycles are zero-carbon means of transportation Therefore, from the perspective of low carbon, when the rural area is not very large and the road distance is not very far, bicycles are more suitable means of transportation, and bicycles can be used for mountain and rural sightseeing tours.

(2) Low-carbon parking lot planning and design

The low-carbon practices and selection of paving materials for parking lots are briefly analysed according to the research data (Table 3). The low-carbon paving materials for rural parking lots are comprehensively evaluated from three aspects: strong water permeability, low cost, and low maintenance cost. Permeable bricks and grass-planting bricks have better performance in terms of comprehensiveness and water permeability, and should be selected first, in line with the concept and construction goals of low-carbon landscape design for parking lots.

Table 3

Comparison of characteristics of different types of paving materials in parking spaces

Material	**Basic cost of materials**	**Maintenance cost**	**Water permeability**
Asphalt	medium	low	low
Concrete	medium	low	low
High load-bearing exposed aggregate permeable floor	high	medium	high
Permeable brick	low	medium	medium
Grass brick	low	high	medium
Planting grid	medium	medium	high
High load-bearing planted lawn	high	medium	medium

(3) Low-carbon road planning and design and route organisation

The construction process of rural roads and the use of road facilities such as road lighting emit a certain amount of carbon dioxide. Therefore, low-carbon road planning and design and route organisation can be considered from the following aspects:

1) According to the different types of rural roads, the roads are classified and graded. The main roads in and out of the village are the first-class roads, the secondary vehicle roads are the second-class roads, and the entrance roads, wooden plank roads, mountaineering roads, etc. are the third-class roads. It is necessary to build rural greenways as much as possible, and form a pedestrian network combined with three-level roads, and advocate low-carbon walking and cycling for viewing and recreation.
2) In the villages, in order to meet the needs of different tourists for their choice of tour methods, village stations that provide bicycle rental services can be set up to facilitate tourists to rent and return them at any time, create a public service transportation system with rural characteristics, and increase transportation options and reduce emission of transportation carbon dioxide.

3) The ground paving should choose materials with local characteristics and less damage to the environment, such as the use of local paving materials such as old slate in area, combined with the principle of strengthening the landscape image with local characteristics. When choosing street lamps, choose energy-saving street lamps or clean energy street lamps to achieve the goals of energy saving and carbon emission reduction.
4) Fully consider the road greening according to the road environment. On the premise of not affecting the landscape viewing on both sides, the greening planting spacing can be appropriately increased, and plants such as cherry blossoms can be planted to increase the carbon sequestration effect and form the cherry blossom road landscape effect.

The calculation of rural landscape carbon footprint

In the life cycle of a building, each stage will generate a certain amount of carbon emissions. According to the research (Fig. 2), the carbon emissions in the building use stage and the building materials production and transportation stages account for the vast majority of the carbon emissions generated in the building life cycle. Therefore, rural low-carbon buildings should be designed with low-carbon from the use stage and the design and construction stage to reduce energy consumption.

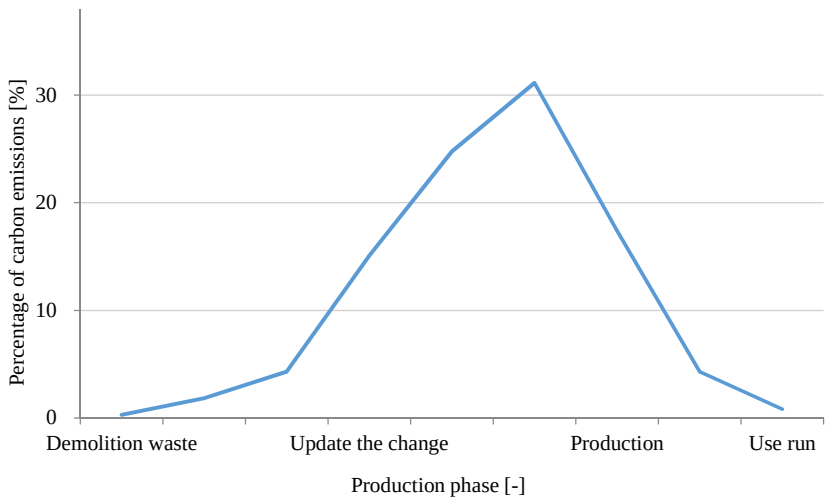


Fig. 2. Composition of energy consumption in the building life cycle

The form, orientation, space and other aspects of the building have an important impact on ventilation, lighting, and heat exchange. The thermal performance of the building envelope, natural lighting and natural ventilation have an important impact on the energy consumption of the building (Fig. 3). Rational use of natural ventilation in rural buildings can reduce air-conditioning energy consumption, thereby reducing carbon emissions. In terms of site selection and layout, traditional Chinese rural buildings pay attention to feng shui and north-south orientation, which can effectively improve ventilation. Many

rural buildings are low-rise courtyard structures, with patios set up in front of each hall, and the buildings use large depths, deep eaves, eaves corridors and mezzanine layers, which can shade the sun and increase natural ventilation.

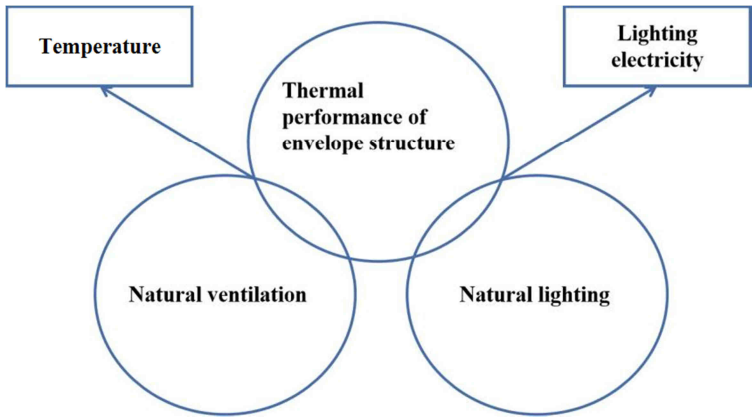


Fig. 3. Principles of low carbon building design

The use of different structures in rural buildings has a significant impact on the CO_2 emissions from the construction and use of buildings. According to the comparison of carbon emissions in the production and transportation stages of wood structure, steel structure, and concrete structure buildings with the same building area (Fig. 4), the form that rural low-carbon buildings should take in terms of structure is determined.

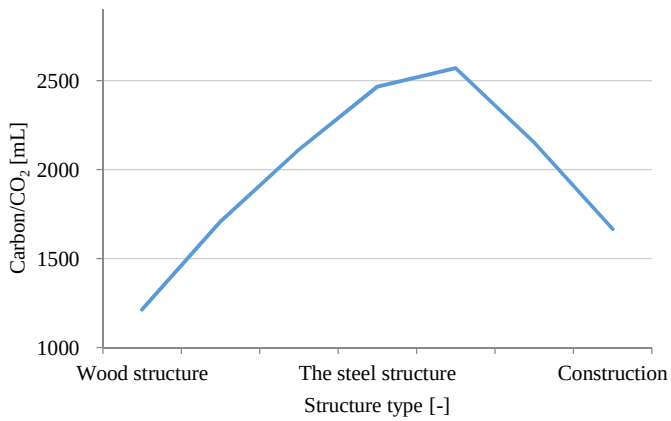


Fig. 4. Carbon emissions in the production and transportation process of different building structures

The manufacture and transportation of building materials are the main energy-consuming processes in the construction phase. Therefore, selecting appropriate materials is a major way to reduce building energy consumption and carbon emissions. The following is a comparative study on the calculation and comparison of carbon emission

data of rural buildings with different types of materials in terms of building production and transportation according to the life cycle method, so as to determine which materials should be preferred for rural buildings from the perspective of low carbon. Among them, the carbon emissions of materials in the production stage are calculated by the following formula:

$$C_1 = \sum_{i=1}^{n} m_i \cdot q_i \cdot (1 - \delta) \tag{1}$$

C_1 represents the carbon emission of building materials in the production stage [kg], m_i - the usage of the *i*-th building material, q - the carbon dioxide emission of the *i*-th building material in the production unit [kg/unit], i represents the number of types of building materials; δ represents the recovery rate of recyclable building materials.

Since the carbon emissions of different materials are compared (Table 4), the following formula is used to calculate:

$$C_2 = m_i \cdot q_i \cdot (1 - \delta) \tag{2}$$

Carbon dioxide emissions during material transportation mainly consider the carbon dioxide emissions from energy consumption such as oil during the transportation of building materials from factories to construction sites. The choice of different transportation methods means of transportation, and transportation distances can greatly affect the carbon emissions during material transportation.

According to the relevant calculation formula, the carbon emission in the material transportation process is equal to the product of the quality of material transportation, the carbon emission factor of the transportation method, and the transportation distance. The transport mass of the material is calculated as 100 tonnes. The calculation formula is:

Since the calculation is carried out according to one material, and construction materials are generally transported by road, the calculation is carried out according to the following formula:

$$C_{21} = m_i \cdot q_i \cdot (1 - \delta) \tag{3}$$

In formula (3), C_{21} represents the control factor, and the larger the value of C_{21}, the higher the level of detail of the terrain; on the contrary, the lower the level of detail.

The transportation distance of building materials will adopt the average transportation distance of regional statistics as the default value of transportation distance (Table 4).

Table 4

Average transportation distance of building materials

Name of building material	Average transportation distance [km]
Concrete	64.38
Wood	58.02
Brick	56.65
Stone	54.42

The transportation modes of building materials in my country are mainly two modes of transportation: road and railway. The consumption of gasoline and diesel during transportation will produce a certain amount of carbon dioxide emissions. And different modes of transportation will affect the amount of energy used, which will affect the carbon

emissions. Calculations are made based on the transport of materials by road transport and the carbon emissions of different materials during the transport phase (Fig. 5).



Fig. 5. Carbon emissions of different materials during transportation

Experimental analysis

In this paper, the carbon footprint of Xiwuli Village is calculated as the interior of the village. The calculation is made from the aspects of building power consumption, vehicle fuel consumption, road lighting, square power consumption, and carbon dioxide emissions from waste disposal, excluding external traffic. In this paper, the land used for carbon sink is divided into forest land, farmland, vegetable garden, green space beside the house, and courtyard green space.

The scheme design of this paper is carried out according to the low-carbon concept. To verify the effectiveness of low carbon, the carbon footprint is calculated twice. Before and after the planning and design, the carbon emissions from power consumption, fuel consumption and plant carbon sinks were calculated from the six aspects of building carbon emissions, transportation carbon emissions, road carbon emissions, site carbon emissions, waste disposal carbon emissions and green space carbon sinks, which is to test the effect of low-carbon planning and design strategies. In the specific calculation, not only one method is used for calculation, but the calculation is mainly based on several aspects of buildings, vehicles, roads, sites and waste disposal. The calculation period is one year.

(1) Calculation method of carbon footprint

1) Calculation method of building carbon footprint

Calculating a building's carbon footprint is primarily about calculating the electricity consumed by the building.

Building electricity consumption carbon footprint = building area · electricity consumption · electricity carbon dioxide emission coefficient

2) Calculation method of traffic footprint

The carbon footprint of a vehicle is the carbon emissions of fuel.

Vehicle carbon footprint = vehicle fuel consumption liters per kilometer · distance · fuel carbon emission system

3) Calculation method of road carbon footprint

Refers to the carbon emissions from road lighting.

Road carbon footprint = road lighting power consumption · electricity carbon dioxide emission coefficient

Carbon footprint calculation before and after planning

(1) Calculation of building power consumption

According to the reconstruction of the buildings in Xiwuli Village, low-carbon calculations are carried out according to the outer envelope structure, the use of low-carbon materials, and solar energy technology. The use of external protective structures and low-carbon materials can save 2.36 kg of standard coal per square meter per year. According to the data, the conversion of 1 kg of standard coal into carbon dioxide emissions is 2.49 kg, and the reduction of carbon dioxide is 90,185 kg based on 15,347 m^2.

For example: According to statistics: every 1 kWh of electricity saved, 0.4 kg of standard coal is saved accordingly, and 1 kg of carbon dioxide is reduced at the same time. Using solar energy, the annual solar energy utilisation factor is 0.58. Each building uses 5 sets of solar energy, the lighting area of each set of solar energy is 1.3 m^2, and each set saves 300 kWh of electricity per year. There are 59 buildings in Westwood, so 88 kWh - 500 kWh of electricity is saved every year, and carbon emissions are reduced by 51,330 kg.

Reduced carbon emissions [kg]:

$$15{,}347 \cdot 2.36 \cdot 2.49 + 300 \cdot 59 \cdot 5 \cdot 0.58 \cdot 1 \approx 141{,}515 \quad (4)$$

(2) Carbon footprint of vehicle fuel consumption

The construction of a parking lot at the entrance of reduces the number of vehicles entering the village, and encourages tourists to go sightseeing on foot or by bicycle, which not only eases traffic, but also reduces carbon dioxide emissions. One parking lot will be built in Xiwuli Village, and 50 car parking spaces will be set up, and the average daily parking rate will be calculated as 80 %. The carbon footprint of foreign vehicles reduced by the parking lot refers to the carbon dioxide produced by tourists consuming gasoline during driving in the village, excluding the total vehicle driving distance from the entrance of the village to the parking lot and the distance from the parking lot to the entrance [13, 14]. According to the data, it is calculated that the construction of the parking lot can reduce the carbon dioxide of foreign vehicles by 5026 kg every year.

(3) Carbon footprint of road lighting

After design, the road lighting adopts solar energy, so the carbon footprint of road lighting is 0 kg (Table 5).

Table 5

Calculation table of carbon footprint of road lighting after planning and design

Total road length [m]	**Number of poles**	**Total power consumption in one year [kWh]**	**Total CO_2 emissions from road lighting [kg]**
722	24	0	8419.5

Through the above calculation and comparison, it is found that:

(1) Building electricity consumption accounts for most of the rural carbon footprint, both before and after design. The carbon footprint of waste disposal accounts for the second largest proportion, and the proportion of carbon emissions in transportation, square courtyard lighting, and road lighting is very low.
(2) After the design scheme adopts low-carbon technologies such as solar energy, the carbon footprint of building electricity consumption is greatly reduced, and it plays a key role in reducing the total carbon footprint.
(3) Rural green space plays a significant role in the absorption of rural carbon emissions, and can be further increased through rational design.
(4) After the low-carbon design of all aspects of the village, the total carbon footprint of the village can be reduced to a very low level.

After analysing the above data, it can be seen that in a village like Xiwuli, due to the large number of buildings and the large building area, and with some commercial rural buildings such as homestays and farmhouses, most of the carbon emissions come from building energy. consumption. Due to the large local population and the large tourist population, waste emissions account for the second largest. Since the number of lighting fixtures to be set in squares and courtyards is not large, and the unit energy consumption is low. Therefore, the power consumption and carbon footprint of square courtyard lighting are low. Since the main vehicle road system in Xiwuli Village is relatively simple and the distance is short, the carbon emissions of vehicles and road lighting are relatively low. In the design plan of Xiwuli and the low-carbon construction of rural landscape in the future, the energy consumption of buildings should be improved, and sustainable energy such as solar energy should be used to reduce carbon dioxide emissions [15]. Because the main factor that distinguishes rural areas such as Xiwuli from cities in terms of carbon sequestration capacity is the large area of green space such as forest land and farmland, the carbon sequestration effect is obvious. However, the vast majority of rural areas are buildings, courtyards, woodlands, and farmland. Under the condition of large-scale protection of the original green base, the increase in rural carbon sinks is limited.

The main methods for reducing the carbon footprint of rural areas are the use of low-carbon materials and technologies in construction, and the rational recycling of rural wastes. The main ways to improve carbon sinks in rural areas are the restoration of carbon sink forests, the construction of vegetable gardens, public green spaces, and courtyard green spaces.

Conclusion

Rural areas have large populations. With the development of rural tourism, more and more people move from the city to the countryside, so the rural landscape produces a lot of carbon emissions every year. However, the countryside has a large area of forest land, farmland and other green space, and it is also an area with obvious carbon sink capacity. Through reasonable planning and design, the carbon emissions of rural landscapes will be greatly reduced, and through reasonable protection of rural natural bases and appropriate increase of green space, its carbon sink function will be increased to a certain extent, thereby improving the sustainable development of rural landscapes. Therefore, it is necessary to plan and design the rural landscape from the perspective of low-carbon

construction, so as to make the countryside a low-carbon tourism destination, protect the rural environment, and improve the tourism development of the countryside.

Research people like to see and hear and are willing to practice low-carbon tourism behaviour, guide and encourage them to have a low-carbon tourism behaviour awareness in the new era of tourism transformation, the popularisation and promotion of low-carbon tourism necessary projects. In the following research, the existing and potential low-carbon tourism in the tourism market will be studied and visited, and the basic characteristics and demand points of low-carbon tourism will be extracted, and the cognitive structure of low-carbon tourists will be completed, so that through the demand and supply channels of low-carbon tourism market, the product design, development and construction of tourism areas will be completed. The policy choice of low-carbon tourism project and the targeted response of low-carbon culture promotion in order to promote the healthy and sustainable development of low-carbon tourism in China. This is another important task that academic research needs to complete.

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