

10.18686/frim.v2i6.4683

Landscape Design Based on the Concept of Green Building Environmental Protection

Junhua Yu

Hainan Vocational University of Science and Technology, Haikou, Hainan 571126

Abstract: Based on the concept of green building environmental protection, this paper deeply discusses the ecological, economic and social sustainability in landscape design. By analyzing the integration strategy of green building and landscape, combined with the actual cases at home and abroad, a series of design methods to realize the integration of natural ecology and cultural characteristics. The article aims to provide theoretical guidance and practical reference for urban landscape design, and promote urban sustainable development and ecological civilization construction.

Keywords: Green building environmental protection concept; Landscape design; Natural ecology; Cultural characteristics; Sustainable development

Introduction

With the acceleration of the urbanization process, the urban environmental problems have become increasingly prominent, and the green building and landscape design have become an important means to solve the problem of urban sustainable development. The concept of green building environmental protection emphasizes in the whole process of building design, construction, operation and maintenance, to maximize the conservation of resources, environmental protection and reduce pollution, to provide people with healthy, applicable and efficient use of space. Landscape design is through the reasonable allocation of plants, water, terrain and other landscape elements, to create a beautiful and comfortable environment, improve the quality of urban life. This paper combines the concept of green building environmental protection with landscape design, and discusses how to realize the harmonious coexistence of natural ecology and cultural characteristics through innovative design techniques.

1. Overview of the green building environmental protection concept

The concept of green building environmental protection refers to the harmonious coexistence of the building and the natural environment, reduce the impact on the environment, and improve the ecological and social benefits of the building. This concept emphasizes people-oriented, focusing on the comfort and health of the building, while considering both economy and practicality^[1].

Ecological benefits: Green buildings can reduce energy consumption and carbon emissions and improve the environmental adaptability of buildings by adopting environmental protection materials, energy-saving technology and green vegetation. At the same time, green buildings can also promote biodiversity, improve urban microclimate, and improve urban ecological quality^[2].

Social benefits, green buildings not only focus on the performance of the building itself, but also pay attention to its impact on society. By providing a healthy and comfortable use environment, improve the quality of life of residents and promote social harmony. In addition, green buildings can also drive the development of green industries and promote the optimization and upgrading of the economic structure.

2. The concept of green building environmental protection in garden landscape design

2.1 Landscape ecological design

Landscape ecological design is the core of landscape design, which emphasizes the creation of a harmonious and symbiotic ecological environment on the basis of protecting the natural ecology and through the rational allocation of landscape elements. Specific measures include: ecological restoration, the use of vegetation restoration, soil restoration and other technical means to repair the damaged natural ecosystem, and improve the stability and self-restoration ability of the ecosystem^[3]. Green space planning, reasonable planning of green space layout, increase green space area, improve vegetation coverage, improve urban microclimate, alleviate urban heat island effect. Biodiversity conservation: select appropriate plant species, build multi-level plant communities, provide habitat and food sources for birds, insects and other organisms, and promote biodiversity.

2.2 Green materials and energy-saving technology

In the landscape design, green materials and energy-saving technology should be actively adopted to reduce energy consumption and environmental pollution. Specific measures include: green building materials, choose environmental protection, renewable or recycled materials, such as permeable brick, wood and plastic materials, to reduce the dependence on traditional building materials. Energy-saving irrigation, using intelligent irrigation system, automatically adjust the water demand of plants and soil moisture to reduce the waste of water resources. Solar energy utilization, solar photovoltaic panels are set in landscape design, collect solar energy for landscape lighting and irrigation and other purposes, improve energy efficiency.

2.3 Stormwater management and water recycling

Rainwater management is an important link in landscape design. Through reasonable rainwater collection, treatment and utilization, the pressure of rainwater runoff on the urban drainage system can be reduced and the utilization efficiency of water resources can be improved. Specific measures include: a rainwater garden, setting up a rainwater garden in the landscape design, purifying rainwater and replenishing groundwater through the filtration of plants and soil. Permeable pavement, using permeable pavement materials, increase the permeability of the ground, reduce rainwater runoff, improve the urban flood control capacity. Water recycling, the establishment of water recycling system, the rainwater collected for landscape irrigation, car washing and other purposes, to realize the recycling of water resources.

2.4 Integration of cultural characteristics and landscape

In the landscape design, we should pay attention to the integration of cultural characteristics, and inherit and carry forward the local culture through the design and innovation of landscape elements. Specific measures include the use of traditional elements, integrating traditional architectural elements, agricultural tools and other cultural symbols into the landscape design, to show the local characteristics and cultural heritage. Farming experience areas are set up for residents and tourists to experience farming culture and enhance their understanding and identification of traditional culture. Using farmland to create art, through different colors of crop composition patterns or text, to show the unique charm of farming culture.

3. Case analysis both at home and abroad

3.1 The Oasis Hotel, Singapore

Singapore Oasis Hotel is a perfect blend of green buildings and landscape, with a green floor area ratio of up to 1100%. The exterior of the hotel is a mesh shell made of red porous aluminum panels, covered with 21 different species of climbing plants, which not only provides food and living space for birds and insects, but also provides a unique ecological living experience for urban residents. The hotel also has a number of hanging gardens and green layers, which improve the green coverage, enhance ventilation and natural lighting. Located in the bustling urban center of Singapore, as one of the representatives of the world's best high-rise buildings, its design cleverly combines the concept of green building with landscape art to create a modern and ecological living and leisure space. This building has not only attracted the attention of the world with its unique appearance, but also led the trend of future architectural development with its inherent design concept.

The Oasis Hotel has integrated the design concept of green building from the beginning of its planning. The exterior uses an innovative building material, the — red porous aluminum plate. This design not only gives the building a unique visual effect, but more importantly, the mesh structure covers the building with a layer of “green clothes”. The “green coat” is covered by 21 different species of climbing plants that not only beautify the architectural appearance, but also provide rich food sources and habitat space for birds and insects, greatly enriching urban biodiversity. Inside the building, the Oasis Hotel also pays attention to energy conservation, emission reduction and resource recycling. Through the use of energy-efficient and energy-saving air conditioning system, intelligent lighting system and rainwater recovery system and other advanced technologies, the hotel has realized the efficient use of energy and the maximum resource savings. In addition, the hotel also actively promotes the use of renewable energy, such as the application of solar photovoltaic panels, providing part of the power supply for the hotel, reducing the dependence on traditional energy.

The garden landscape design of the Oasis Hotel is another big highlight. The designer made full use of the spatial characteristics of the building, and skillfully combined the natural landscape and the artificial landscape to create a multi-level and multi-dimensional green ecological space. Inside the hotel are several hanging gardens and green floors, which not only beautify the built environment, but also provide an excellent place for guests to get close to nature and relax. The design of the sky garden fully considers the ecological habits and ornamental value of the plants, and chooses a variety of plants adapted to the tropical climate for collocation planting. These plants are not only rich in colors and different forms, but also have good air purification ability, bringing fresh air and pleasant atmosphere to the internal environment of the hotel. In addition, the garden also has a rest area and a footpath for residents to stroll around and enjoy the gift of nature.

3.2 Meili Snow Mountain National Park

Meili Snow Mountain National Park, located in Diqing Tibetan Autonomous Prefecture, Yunnan Province, is the first pilot national park in China. The park has rich natural landscape and biodiversity resources, while paying attention to the protection and inheritance of cultural characteristics. Meili Snow Mountain National Park, located in Diqing Tibetan Autonomous Prefecture, Yunnan Province, China, is a national nature reserve that integrates natural scenery, biodiversity protection and cultural inheritance. The park is not only famous for its magnificent snow-capped mountain landscape, but also shows its unique charm in the integration of green building environmental protection concept and landscape design.

The landscape design of Meili Snow Mountain National Park is based on the natural ecology, making full use of the existing natural landscape resources, and through careful layout and ingenious design, creating a beautiful and practical ecological landscape system. The footpath, observation platform, rest area and other facilities in the park are made of environmentally friendly materials, and are integrated with the surrounding environment, which not only meets the viewing needs of tourists, but also reduces the interference to the natural environment. In the landscape design, Meili Snow Mountain National Park also pays attention to the integration of cultural characteristics. There are many exhibition areas for Tibetan culture in the park, showing the unique charm of Tibetan culture through sculptures, murals, stone carvings and other art forms. At the same time, the park also regularly holds Tibetan festival activities, such as the Tibetan New Year and the Shambhala Festival, so that tourists can enjoy the natural scenery and have a deep understanding of the connotation and essence of Tibetan culture.

Meili Snow Mountain National Park also fully embodies the concept of green building environmental protection in its architectural design. The visitor service center, scientific research station and other buildings in the park are equipped with energy-saving and environment-friendly building materials and technologies, such as solar photovoltaic panels and rainwater collection systems. These buildings not only meet the demand of use, but also reduce energy consumption and environmental pollution. In addition, the park also focuses on garbage classification and resource recycling. A number of garbage sorting and recycling stations have been set up in the park to guide tourists to separate their garbage. At the same time, the park also uses kitchen waste and other organic waste for composting, for greening maintenance and soil improvement in the park.

4. Epilogue

Under the guidance of green building environmental protection concept, this paper puts forward the integration strategy of ecology, culture and society in landscape design. Case analysis and verify the effectiveness and feasibility of these strategies. In the future, we should further explore the deep integration of green building environmental protection concept and landscape design, and promote the sustainable urban development and ecological civilization construction.

References

- [1] Shi Yanping, Li Lin. Research on urban landscape design under the concept of green building environmental protection [J]. *Hua Zhang*, 2023, (12): 76-78.
- [2] Zhong Weichao. Analysis and study of landscape design under the perspective of green building [J]. *Footwear process and design*, 2023, 3 (18): 131-133.
- [3] Gao Yuwei. Research on landscape design based on the concept of green building [J]. *Ceramics*, 2022, (09):175-177.DOI:10.19397/j.cnki.ceramics.2022.09.053.