

Eco-restorative Landscape Architecture Design Based on Green Responsibility-Taking Zhangjiakou Industrial Culture Theme Park as An Example

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Abstract

This paper begins with a definition of core concepts, followed by a description of principles and methods of eco-restorative landscape architecture design. Finally, it takes Zhangjiakou Industrial Culture Theme Park as an example to illustrate how landscape architects conduct eco-restorative landscape architecture design based on green responsibility to protect the natural environment and thus facilitate the sustainable development between man and nature.

Keywords

Green responsibility; eco-restorative landscape architecture design; Zhangjiakou Industrial Culture Theme Park; sustainable development.

1. Introduction

With the rapid development of the social economy, the process of urbanization is accelerating, and more and more new residential areas are built. In order to improve the environmental quality of residential areas, landscape architects usually adopt the *people-oriented* design principle in the design of residential landscape, while ignore the need for harmonious symbiosis between man and the nature, resulting in great damage to the natural environment. Hence, here comes the paradox between people's greater demand for a better living environment and an increasingly deteriorated natural environment. In this context, based on the concept of green responsibility, this paper intends to explore how landscape architects carry out eco-restorative landscape architecture design to protect the natural environment and biodiversity and thus facilitate the sustainable development between man and the nature.

2. Definition of Core Concepts

This chapter is concerned about the definition of two core concepts: green responsibility and eco-restorative landscape architecture design.

2.1. Green Responsibility

The concept of green responsibility comes from corporate social responsibility, which means a firm's responsibility to the society. Accordingly, the concept of green CSR or green responsibility was then proposed. A firm's green responsibility refers to the firms' social responsibility in environmental protection and resource utilization. Specifically speaking, green responsibility involves that a firm has the responsibility to avoid resource waste and minimize its destruction to the environment during its operation process^[1]. This concept is also applicable to people. Landscape architecture is concerned about the relationship among man, the built and natural environments, so landscape architects have the green responsibility to facilitate the sustainable development between man and the nature.

2.2. Eco-restorative Landscape Architecture Design

Any design form that coordinates with the ecological process and minimizes its damage to the environment is called ecological design. This coordination means that the design should respect species diversity, reduce the deprivation of resources, maintain nutrition and water cycle, and maintain the quality of plant habitat and animal habitat so as to improve the health of living environment and ecosystem^[2].

Eco-restorative landscape architecture design refers to the use of scientific means to solve the actual ecological pollution problem, and the use of ecological principles to further study the composite artificial ecosystem. Eco-restorative landscape architecture design involves the knowledge of such subjects as Pollution Ecology, Restoration Ecology and Human Ecology. Different from the traditional landscape architecture design, eco-restorative landscape architecture design attaches importance to the reconstruction and regeneration of the polluted and damaged waste sites, as well as the restoration and reoperation of the site ecosystem.

Eco-restorative landscape architecture design plays a positive role in urban development, and meanwhile has important significance for people's physical and mental health. The restoration of the ecological environment is also related to the development of social economy, and helps to realize the common development of man and architecture, man and nature, architecture and nature, and the harmonious coexistence of economy, society, culture and environment.

3. Principles of Eco-restorative Landscape Architecture Design

Eco-environment restoration is not only a natural development process but also a process of reshaping the environment. Therefore, the eco-restorative landscape architecture design first needs to follow the basic principles of sociology, economics and other disciplines. Besides, the restoration and reconstruction of the ecosystem is actually an evolution process of the ecosystem under human control or guidance. Thus, the eco-restorative landscape architecture design also needs to comply with the basic principles of Ecology: species symbiosis principle, material flow principle, energy flow principle, self-maintenance and self-regulation principle, etc^[3].

4. Methods of Eco-restorative Landscape Architecture Design

Specifically speaking, landscape architects are supposed to adopt methods of eco-restorative landscape architecture design as follows.

- (1) Change the traditional design idea that landscape serves people into the design idea that landscape also serves the natural environment itself, and establish the design philosophy of respecting the nature and equal coexistence of all things.
- (2) Help the site to build its self-adjusting ability so as to achieve a sustainable ecological balance, establish its self-operating system, and have the original buffering ability to resist damage to realize the real ecological restoration.
- (3) Make a systematic analysis of the site with scientific ideas and methods such as its topographic features, plant community, animal habitat, hydrological system, surface runoff, soil texture, and so on, predict the impact of external environmental factors such as climate, precipitation and wind direction on the site, summarize the structure and characteristics of the ecological cycle so as to formulate a suitable landscape architecture design scheme.
- (4) Integrate the ideas and theoretical knowledge in the fields of ecology, pedology and climatology and adopt various scientific methods to propose a proper solution according to the different problems on the site so as to guide the improvement of the natural environment.

5. A Case Analysis of Eco-restorative Landscape Architecture Design of Zhangjiakou Industrial Culture Theme Park

Zhangjiakou Industrial Culture Theme Park is reconstructed on the abandoned railway track. It is the first large-scale public urban leisure space integrating industrial culture, Olympic culture and modern art in Zhangjiakou. This paper will make a detailed analysis of the park from the following dimensions to show how landscape architects conduct eco-restorative landscape architecture design based on green responsibility.

Park style: In order to reflect the industrial culture and protect the industrial heritage, landscape architects integrated the Olympic culture, added the Olympic elements to the construction of the industrial culture theme park, and widely used scientific construction techniques and methods.

Main landscape: The abandoned water tower reserved, the tallest structure in the park, was transformed into a landscape tower in the form of small waist, which gathers the focus of sight and is the landmark landscape of the whole park. Inside the park, the locomotive body was reconstructed into an activity place, while the locomotive mirror was transformed into a fountain square. The regeneration of abandoned industrial products also reflects the theme of the park. A rain garden was also designed in the park, which is presented in the form of dry creek in the lower part of the terrain. Beside the dry stream, there are footpaths and terraces, which are usually dry stream landscape. When the rainfall is large, the rainwater can be stored here to become stream landscape.

Roads: To the south of the landscape tower in the form of small waist, landscape architects designed a smart runway in combination with the Winter Olympic Games. The runway, arranged around the abandoned railway, is capable of smartly recording the running status of runners, thus increasing the fun of the park. The abandoned railway was transformed into a walking path. Tourists can feel the historical development track and the achievements of industrial development while walking along the railway.

Plants: A variety of plants were planted in the park with a green coverage up to 85%. Landscape architects adopted the design method of multi-level combination of trees, shrubs and grasses for plant planting, and used local tree species, thus creating a beautiful plant landscape and restoring the ecological environment.

Park value: Landscape architects adopted various new high-tech instruments to design the park based on a sustainable development idea. The park forms a sharp contrast between modern landscape and industrial heritage, shows the changes from an industrial society to an information society, and witnesses the progress and development of the times.

To sum up, the Park regenerated the original abandoned site. Landscape architects used scientific means during the process of the eco-restorative design, thus realizing the purpose of both building modern landscape and protecting industrial and cultural heritage. In this way, the local ecological environment is improved, and the sustainable development between man and the nature is facilitated. The Park is a good example of how eco-restorative landscape architecture design was conducted based on green responsibility to maintain a harmonious development between man and the nature.

6. Conclusion

With the development of the social economy, people demand for greater quality of the living spaces, so many new residential buildings were erected, and this deteriorates the natural environment. This paper begins with a definition of core concepts, followed by a description of principles and methods of eco-restorative landscape architecture design. Finally, it takes Zhangjiakou Industrial Culture Theme Park as an example to illustrate how landscape

architects carry out eco-restorative landscape architecture design based on green responsibility to protect the natural environment and thus facilitate the sustainable development between man and the nature.

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