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Ecological Waterscape Design Based on the Culture of China's Classical Gardens

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Abstract

The purpose of this thesis is to discuss the proper method for ecological waterscape designing in modern Chinese city, which have some problems such as resources wasting, environment pollution and no cultural connotation. The method used in this study is that there are many good ideas which hidden in Chinese traditional culture, especially the thoughts of "water managing" in China's classical garden. With the retrospection of those historical concepts or methods, we can be stimulated to find out some reasonable solutions to improve the existing planning and design system of modern waterscape. The studies showed that only through the way of nature respecting and culture inheriting, can the good design of modern waterscape be made.

Keywords: City Waterscape; Ecological Design; Triditional Chinese Garden Culture

1 INTRODUCTION

Althought great development have been achived in Chinese society, many original water ecology has been destroyed under some unresonable planning and design. This not only violates the initial purpose of green design, but also impacts the effect of the landscape, even the most significant environment destroys. Then, this problem should be improved on the base of local situation, traditional context inheriting and innovation, such as the philosophy of nature and the ideological system of "water managing" in China's classical garden. This paper is divided into four major sections are as follows: In the first section, the author will illuminate the traditional culture background and common methods of water managing in China's classical garden. In the second part of this paper, it will be shown that the urgency of solving the present situation of resource wasting and water polluting in modern urban waterscape via some case study. Thirdly, some ideas of ecological design of waterscape will be mentioned. And the ecological waterscape future trends will be articulated in the last section of this paper.

2 WATER IN CHINESE CULTURE CONTEXT

When a developed social structure brings us with improvement in material, it also brings us with tensional life pace and spiritual pressure. People therefore hope they could live in a place with clear and beautiful waterscape, which can help them return to and enjoy a naturally easy life. So waterscape has become popular. However, there has been environmental pollution in some projects which not only violates their initial purpose of waterscape, but also contrary to the virtue of water in Chinese traditional culture.

2.1 WATER`S IMPORTANT IMPLICATIONS IN CHINESE CULTURE

Water has an extremely important position in China's traditional interpretation of its implications. Just as "Shuo Gua of Zhouyi" said, "For giving all things pleasure and satisfaction there is nothing more grateful than a lake or marsh; for moistening them there is nothing more enriching than water". If we say that it is water that inspired Daoism's philosophical idea of Being friendly like water and Making contributions to the nature quietly, then it is just the running and indomitable water that helped formulate the Confucius ethical feeling of those things flowing away day

and night endlessly. Therefore, water has been regarded, in Chinese long history of traditional culture, as the common principle for life between society and nature, and endowed with strong color of human cultures and ethics. The virtue of water has been deeply impressed in the inherited gene of Chinese through thousands of years.

2.2 Water Managing in Chinese Classical Gardens

As an old saying said "Stone helps remember history, and water helps look forward" Superficially, this is a high praise for China's gardening arts by Wen Zhenheng in his "Superfluous Things", but in fact it implies that China's scholars have personified mountains and water with their special concerns and philosophical thinking. And thus the China's classical garden also has its another elegant name of "Philosophical Garden". Water which is always regarded as the blood and soul of gardens played a significant part in the gardening arts of China's classical gardens. The structuring and treating of waterscape is also called "water managing". By their size, gardens can be classified into royal gardens and private gardens. The water managing of royal gardens tends to be large in size, which is the result of long-life idea of Paradise Mountain, such gardens as the Hua Qing Palace of Tang Dynasty and the Summer Palace of Qing Dynasty. This type of water managing is complicated and variable in its water system, and so it is always beyond the affordability of many civilian organizations although it wins the natural interests that the mountains go alive with water, water becomes enchanting with mountains. In contrast with the majestic and generous water managing of royal gardens, the water managing of private gardens focuses on such effects of imaging the big from the small and imitating the nature, and pursues such an artistic realm of looking natural out of being manmade. Of those, the private garden of Suzhou is a typical one. Although those gardens were small in size, they were built like the heaven of peace and happiness, being high because of mountains, or low because of soil, or upward because of water, or bathed in the refreshing breeze and the bright moon, and so they also held the profound meaning of living in paintings by putting the unspiritual thinking aside [3]. It is just the development and prosperity of those gardens that indicated the further combination of the interests from human talents and cultures, and promoted the flexible and various water managing methods.

2.3 Specific Methods of Water Managing

Specifically, one of the water managing methods of China's classical gardens is Covering, that is, the water source is hidden under buildings, flowers and trees (refer with: Fig. 1). For example, static buildings and dynamic water are integrated together by leaving corridors, pavilions, and sheds over the water surface with the outflows under those buildings. Thus we can not only watch its shapes, but also hear its sounds, obtaining an audio-visual enjoyment of dynamic water and static mountain. Another water managing method is Separation, that is, in order to break through the limitation of a garden's limited space, the limited space can be enclosed and separated through buildings, and be blended into the nature to show its rich and variable natural levels. Examples as the method of setting bridges in the way of running water used in "Yuanye", which increased both the vista vision and the natural levels, and made the water surface have a feeling of tranquility and depth. A third method is Breaking, that is, to create an atmosphere of big water flow through little water flow, which means even if in a small pool, using ripraps as the bank, making strange stones crossing, producing laniary shapes of stones, planting slim bamboos vines, and feeding fish and algae as decorations, the pool would be able to show its style of deep mountain forest. The final method is Spot, that is, a building can be built at the long-distance end of the waterscape, serving the function of concentrating the views and breaking the blank. All these methods are worth our using in modern residential environments, but the more important things are the excellent traditional Chinese human cultures and natural thoughts behind those methods which are more worth our heritage and innovation.

3 Present Situation of Modern City Waterscape in China

3.1 Basic Types of Modern Waterscape

Waterscape in modern city can be divided into waterfront and Artificial waterscape. Waterfront waterscapes are that can be constructed at low costs, and do not need large water-diverting facilities or landscape accessories. But the flaws are indicated by difficult rebuilding as expectations. Once more artificial work is introduced into the waterfront, it might lead to water pollution. Artificial waterscape means manmade water-diverting or water-creating in those

environments without water sources. So, the advantage of artificial waterscape is its flexible design methods, and the disadvantage is its high costs of post-maintaining and rebuilding.



FIG. 1 GARDEN OF LIU YUAN, SUZOU; WATER SOURCE IS HIDDEN UNDER THE PAVILION.



FIGURE 1 WATERSCAPE WITHOUT WATER FOR HIGH MAINTENANCE COSTS.

3.2 Curre

Waterscape design aims to present and satisfy the inherent nature of human beings' being close to water. However, in some specific projects, many items may occur which are deviated from the initial purpose. As research indicated, in the newly-built waterscapes in some cities of our country in recent year, over half of the waterscapes in the gardens are in disuse, of which the problems are mainly shown as follows: the water has stopped running; the quality of the water body has gone bad; the fountain doesn't work; and flies can be seen everywhere. The results are not only just to generate high post-maintaining costs, but also lead to the losses of both environment and economy. Those waterscape designs have their good starting point, but are just nominal in practice. Of them the following issues are especially prominent:

the first is indicated in the blind pursuit of innovation, that is, some projects are initiated without comprehensive planning and feasible evaluation, so that some waterscape designs are abandoned in their half way for their high maintaining costs (refer with: Fig. 2); the second is the pursuit of large area, that is, the real planned land area of many projects is not large, except for the fixed land area for buildings, they have to try to minimize and even sacrifice the areas for public green land, traffic, health care and entertainment etc. in the residential area in order to maximize the waterscape area and the natural sightseeing; the third issue is the ruin of ecology, which is mainly indicated in the establishment of hard substrates and revetments in order to achieve the large-scale development of the existing water body resources, and the result is that it is difficult for hydrophytes to grow and the function of water body's penetration and self-cleanse is also prevented. And thus the weak ecological system of the natural lakes and rivers is significantly destroyed. Another important aspect is the on-site emission of wastewater and sewage without treatment. It also produces water body pollution. Therefore, waterscape is no longer beautiful, and the more worse is its negative nutrition.

3.3 Highlight the Ecological Meaning

It is a good starting point for human beings to rebuild and use nature for their happiness. But their actions violate the order of nature just for their own interests through blind development, and then they would lose the sense of being close to water and even make invaluable losses to themselves, the society and the environment. For those behaviors just for short-term interests without considering their losses more than their obtaining, we should pay attention to and rethink them. As a good residential area, it also should be a scientific, reasonable and healthy residential waterscape space. The time it cares for the economic and social efficiency, it should pay more attention to its ecological meaning. As for a good waterscape design, it firstly should have the potential resources for high quality entertainment and being close to water, and then it should ensure being able to enhance the inhabitability of the area, to richen the moving space in the community, and to promote the establishment of the human and cultural environments, so that a state of harmonious development by humans and environment can be finally formed.

4 ECOLOGICAL DESIGN OF WATERSCAPE IN MODERN CITY

Urban is an ecological symbiosis environment between artificial environment and natural environment. The traditional design method of city waterscape was broke up the dependencies relationship between waterscape and city's environment, which handling landscape merely with constructions. Therefore, ecological Waterscape is based on the aspects of socio-cultural, economic development and ecological cycle, combining the theory and methods of landscape ecology, urban ecology, landscape architecture and ecological restoration technology, integrated concerning the relation both of waterscape, architecture and human.

4.1 Reusing Existing Buildings Reasonably

With the accelerating pace of urbanization in China, city waterfront is packed with many sorts of buildings. Therefore, during the construction and renovation of waterfront landscape, we are accustomed to demolition and construction in a wide range, the reasonable reuse of existing buildings was neglected. This situation not only causes lots of waste, but also interrupts the cultural context of urban development.The reuse of old building is mainly refers to maintain the old building's basic characteristics, exploring the maximum potential usage of the construction, injecting new vitality into the old landscape or architecture. So, the two main contents, which architects must focus, are as follow: Firstly, it is about the history, architecture, technology and other aspects of the old landscape or architecture issues. Secondly, study the new function to find out the best connection with old buildings. The connected principle is meeting the requirements of new function, keeping characteristics of the old building, reasonable structure, viable economic and easy maintenance, making the building into a new virtuous cycle.Inspired by the experience of developed countries, government and planning departments should play a leading role when re-using the old landscape architecture, cooperating with the local community, art schools or building institutions, marking the dangerous or abandoned buildings from the existing constructions, identifying the structural safety, collecting or mapping historical data, strictly making the rational development scale, formulating the appropriate new uses and protection measures. These preliminary works will give a strong guiding for late planning.

4.2 Restoring Water Environment through Ecological Method and Natural Material.

Most artificial waterscape projects, just like artificial lake, ponds, did not follow the circulation of natural system, so they are basically closed systems without self-purification capacity. With irrational internal structure and constant importing from external environment, these kinds of water will inevitable eutrophicating at last, ultimately affecting the ecological environment and city waterscape. The better way is integrated planning and design. That means combining waterscape with city planning blueprint, as well as the factors of actual waters area, volume and self-purification capacity. Purification and maintenance the waterscape through the natural circulation system, it is the main method. The supplementary measure is using high efficiency filter circulating water system in those areas which lacking of nature water resource. In planning and designing, a more comprehensive water ecosystem should be established, which would take great advantages from the purification function of river bottom soil, aquatic plants and animals. It could maintain the energy and nutrient cycling balance, improving water quality by higher plants can restrain the growth of algae, then the water bloom can be avoided.

4.3 Valuing and Utilizing Traditional Culture

Water is the source of life, different understanding of water created different way of water managing in the world. However, most popular used landscape regulatory or ideas in China were introduced from foreign country, which may not be appropriate for domestic. On the other hand, china has a long history, especially the water managing thoughts in Chinese classical gardens. All of them are rich creational recourses for modem urban ecological waterscape. Water is always regarded as the blood and soul of gardens, and played a significant part in the gardening arts of China's classical gardens. The structuring and treating of waterscape is also called water managing. Specifically, the main methods of China's classical gardens can be summarized as covering, separation, breaking and spotting. These traditional methods are worth our exploring in modern ecological waterscape, but the more important things are the excellent traditional Chinese human cultures and natural thoughts behind those methods which are more worth to heritage and innovation.

CONCLUSIONS

Concluding the above discussion, the following conclusions can be drawn: Firstly, China has plenty of resources in waterscape area. They have done some good research work and developed some valuable methods. Secondly, at any rate, China is still backward in this area. The reason for this is lack of ecological planning awareness, and shortage of such technology like green architecture material and industry. Basis on this situation, international cooperation in

modern urban ecological waterscape planning is hopeful and feasible. And China is looking forward to various kinds of cooperation in this field.

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