A preliminary analysis of the waterscape in face of the shortage of water

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Abstract

Recent years, with the gradual advancement of people’s living standard, people are more concerned with the city environment, so the planning and designing of the waterscape is receiving much attention, and the living area with a water scene has become a sign of fashion. The modern landscape designers have to satisfy people’s fondness toward water on the one hand, and admit the shortage of water sources on the other. Therefore, the balance between the two ends, the exploration, use and protection of the natural water resources have become an urgent problem deserving a solution in the modern landscape designing. In the analysis of the current situation and the problems in the landscape designing, this paper offers a few solutions and makes further explorations into the reasonable city waterscape designing.

1. Preface

Endowed with the features of being clear and transparent, clean and pure, gentle and charming, firm and tenacious, water, as a type of natural substance, has become an inevitable element in garden art. An ancient saying goes “water is gentle in nature and the deep pond is always tranquil.” The water itself is a unique substance coupled hardness with softness, movement with stillness. Many famous gardening books and documents in history have made brilliant discussions about our ancient gardenning art. Ji Cheng’s Garden Making discussed about our ancient art of water arrangement. The saying “A hill makes a garden and a scene is worthless without water” is popular in Chinese gardening, so water is vital for the landscape. The modern landscape designers will definitely include the topic of water for a larger purpose in their creation. An obvious trait for the contemporary landscape designing is the pursuit of the
harmonious unity of the artificial environment and the natural environment.

The water is the source of life. The fondness and enjoyment of water, and living near water are the reflections of human’s nature. Each civilization in the world are originated from a river or a lake. People can’t live without water. The use and development of the natural water have become a type of water, which could be seen in every aspect of our life.

2. The analysis of our country’s current water resources and waterscape

Our country is a country having a serious shortage of water. The total fresh water of our country is 2800 billion cubic meters, accounting for 6% of the world’s total fresh water, taking the fourth place, but the per capita water is only 2300 cubic meters, one the fourth of the average level around the globe, so it’s considered as one of the countries with the most severe shortage of water.1

Our country’s usable fresh water is only 1100 billion cubic meters, and the per capita fresh water is about 900 cubic meters. By the end of the twentieth century, more than 400 cities among the 600 cities in our country had the problem of water shortage. 110 cities were faced with severe water shortage, and the total shortage of all cities in China is 6 billion cubic meters.2

The worsening water pollution has not only reduced the usage of the water body, also intensified the problem of water resource shortage, which have severely affected the current strategy of sustainable development implemented in our country, and seriously threatened the safety of drinking water for city dwellers and people’s health.

The Ministry of Water Resources has estimated that the Chinese population will reach 1.6 billion by 2030, and the per capita water resource will be only 1750 cubic meters. Taking the water conservation into the full account, the estimated total water for use will be somewhere from 700 billion cubic meters to 800 billion cubic meters. The usable water quantity in reality for the whole country will get close to the upper limit of the reasonable use of water, so it will be very difficult for the development of water resource.3

3. The conflict between the water shortage and the modern waterscape

In the modern society, the city dwellers are tired of the grey groups of buildings, so the landscape is more and more valued by the people, and the waterscape has been an important of the modern landscape designing. To meet the people’s needs of appreciating water and getting close to water in the market, the environment designing ranging from the residential estate to the city square is focusing on the building of the pro-water residence and the fountain squares. The contemporary city dwellers are going after the residence by water. Water is a bridge between the humans and the nature, and the waterscape is a most charming element in the landscape art. Water makes the environment alive and lovely, shortens the distance between the environment and the humans. Man is naturally seeking water, and the designers are also making efforts to meet such a need. This counter-activity has a good purpose but ends with disappointment.

Recent years, there appears a climate of building city landscape in large-scale. Some cities building dams to cut off the rivers, enclosing the rivers in the cities; some cities spend enormous capital to dig

1 How Water Conservation Is Conducted for All Countries Chinese Economic Net Journal Liu Hongqiao
2 The Per Capita Water Resource in Our Country Accounts for One Fourth of the World’s Gardening Information and Technology Issue 4, 2005.
3 Our Country’s Current Situation of Water Resources
artificial lakes, make the so-called waterscape. In face of the gradual water shortage, how to build a human-friendly waterscape, and how to satisfy such a need, instead of wasting the water resources, are the urgent problems for the designers to think about. (Fig 1)

Fig. 1. Build a human-friendly waterscape

How to make reasonable use of the existing water and how to save water have become one of the hottest topic around the world. Under such a premise, to design a reasonable waterscape and to harmonize the echo-system are in need of further improvement and development so as to reduce the unnecessary waste of water resources, to maintain a good cycle of water for people’s viewing and appreciation. The reachable waterscape is still a problem to be resolved. In the course of many large-scale waterscape designing, many problems have occurred so far. Due to the excessive pursuit of the short-term profits, many unreasonable building activities are taking place. For example, the long-term echo-system has been sacrificed to some extent in many waterscape buildings; too many artificial activities have been imposed to the buildings, and too much water resources have been wasted. I have made a summary to such negative effects as listed below. (Fig 2)

Fig. 2. Unreasonable building activities

The unreasonable use of the water resources owing to the ignoring the regional elements

On the ecological side, the unreasonable use has caused damage to the waterfront eco-environment and in the meantime, people’s daily recreational activities cannot be really satisfied. The present eco-problems in the city waterfronts include: the damaged eco-wetlands, the imbalanced natural ecology, the monotonous water resource, the lack of environment-concerned treatment, etc. The designers should in the waterscape designing consider the local real situations, the cultural traditions, the geographic and geomorphic features, and the local environments so as to reduce the unnecessary waste, and design in accordance with the eco-environments.

The city landscape water for the present mainly comes from the underground water and the running water. The water resource has been largely polluted and is in severe scarcity. In the building of the waterscape, the water’s self-purifying function is ignored. Due to the lack of the aquatic plants, the lively and beautiful waterscape seems to get further away from us. The physical and chemical methods are used to purify the water in waterscape, so the water soon deteriorates and is less recycled. Secondly, the building and maintenance fees for the waterscape are very high when the water management has not been considered in designing. Since most of the waterscape are man-made, the structure, the circulation system
and the storage system may possibly get in troubles, and cause unnecessary problems in the future management.

The absence of the public opinion

The comparatively common public participation at present is merely limited to the visiting investigating the present situation, not a wide inquiry of the public opinions. Very few public will is considered in the landscape planning and building. Due to the absence of interactivity, the public’s practical needs are ignored.

The waterscape building is still focused on people’s viewing and appreciation, short of participation. Especially in the designing of the residential landscape, many waterscapes cover too large an area, which have negatively affected people’s outdoor activity and failed to meet people’s real needs. The designers usually concentrate on the expression of their thoughts, ignoring the mass’s aesthetic requirements. In waterscape constructions, the stereotyped pavilions and the sunk squares are mostly adopted. It pursues the smoothness of planes and lines, but fails to let the people really relax. Without an all-round consideration to all practical problems, most constructions are copying each other instead of suiting their own circumstances.

At the beginning of many projects, a lot of designers mostly copy the other waterscapes. Without deep research and analysis of the local history and culture and people’s needs, they merely follow suit. When the overseas and Chinese big cities build big fountains and water body to form splendid and beautiful waterscape, the middle and small cities desirously copy such designs without caring about their own circumstances and practice, so these constructions usually ends with serious waste.

When designing the waterscape, we should concern more about the regional water resource, especially in places where the water resource is in scarcity.

4. The function and influence of waterscape designing in landscape designing

4.1. The importance of waterscape designing in landscape designing

The importance of water could be seen in a saying that “A hill makes a garden and a scene fails without water” in the Chinese garden designing. Based on the gardens of the ancient and the present, the Chinese and the overseas, we can notice the importance of the application of water. In various styles of garden designing, the water has enjoyed an inevitable place.

Water comes from the nature, bringing forth the dynamic noise and the tranquil peace, even the beautiful reflections. Water is an important consisting part in landscape designing. It provides a living place for plants, fish and wild animals. Water is the most attractive element among all the landscape designing elements. It is most flexible being still, active, making sound, and reflecting the surroundings, so it can act independently as the artistic subject, and can also be combined into the architectures, sculptures, plants and other artistic items to create unique style. For this, the waterscape deserves a place in the public arts. (Fig 3)

4.2. The wide use of waterscape in the landscape designing and people’s daily life

In people’s daily life, the application of waterscape is very wide, represented in every life’s aspect. The early waterscape is combined with other artistic items, so it evolves from the conventional springs and pools affiliated with the sculptures or the godly statues to the waterscape in combination with the abstract profiling, then with the surrounding environment, and then with the human-friendly fountains. Rightly because of these traits, the waterscape in gardening exhibits its wondrous charm.

The water’s special features decide the uniqueness of the landscape beside water. In discussion of the
aesthetic quality of the landscape-by-water, we need learn about the water’s quality and its relationship with the landscape-by-water. By making full use of the various change in form of water, we can build various types of landscapes-by-water.

Fig. 3. Waterscape deserves a place in the public arts

5. The building of excellent waterscapes in circumstance of the scarcity of water

5.1. The basic principles and functions in waterscape designing

The reasonable use of water resource in face of the scarcity of water has become one of the hottest topics around the world. Therefore, the primary question for the designers to think about is how to work out the human-friendly waterscape designing in face of the scarcity.

There are two points in its primary principles: to satisfy the functional requirements, to meet the environment’s overall requirements. One waterscape has a basic function to let people view and appreciate, so it must give people the sense of beauty and make them pleased in viewing and feeling. The artistic sense of beauty is the first thing in designing, and this is the basic function. A good piece of waterscape work should be designed in consideration of the circumstances and the building’s functional requirements to keep a harmonious with the whole landscape in style.

5.2. The three vital factors in waterscape designing

In waterscape designing, the three vital factors include the form, the sound and the color.

The form refers to the shape and the state of the waterscape. The waterscape’s forms include the streams, fountains, ponds, fountains, and the swimming pools, etc. The state is divided into the still water and the active water. The shape can also be categorized as the regular and the irregular. The form is the most vital factor in waterscape designing. To obtain inspiration of the waterscape’s from the nature, and learn to design the waterscape from the nature, the free curve lines of the pools are combined with the artificial hills, high or low, to give people the sense of beauty.

The sound refers to the various sounds made by water, such as the sounds of the streams. The sounds made by the springs and the fountains should be flexible in change and the sound made by fountains should make clear rhythms to represent the sound of pounding when the water impinge the rocks, etc. In the waterscape designing, the sound occupies a vital role.

The color refers to the sense of the textural quality. The water in combination with the animals and the plants and the reflections from the shore constitutes a lively water scene. The pool’s color changes in accordance with the season and the time. The fallen leaves on the surface of the water, the sleeping lotus in the pool and the water under the sunshine express an indescribable scene and sense. (Fig 3) With the

4 http://www.ylstudy.com/thread-26659-1-1.html
help of the digital technology, the fountain’s color can be set freely, and the unpredictable colors and the colorful scenes bring forth fantastic color effects.

5.3. The implementation plan of the waterscape in face of the scarcity of water resource

Generally, a lot of designers mostly copy the other waterscapes. Without deep research and analysis of the local history and culture and people’s needs, they merely follow suit. When the overseas and Chinese big cities build big fountains and water body to form splendid and beautiful waterscape, the middle and small cities desirously copy such designs without caring about their own circumstances and practice, and it turns out to be tragic endings eventually.

When designing the waterscape, we should concern more about the regional water resource, especially in places where the water resource is in scarcity. Therefore, I would like to make some discussions about how to building waterscape in places where the water resource is in shortage.

- Do not desire for large scale waterscape

  In designing the waterscape, we should give more consideration to water in small size, instead of water in large size and less interesting. The water in large size may give you the sense of a solid existence of water, and catch more people’s attention, but it always causes many problems: The difficulty in maintaining the water in large size is probably beyond the designers’ consideration; the water in large size gives people the sense of getting way instead of getting close, while the water in small size is easy to build and it is much easier to meet people’s needs to get close to water, so it can encourage people’s activity, let alone the late maintenance and management. (Fig 4)

![Water in small size](image)

- To learn from the nature

  A very important principle in our classical garden building is “learn from the nature”, that is, in observance of the natural laws in designing, we learn from the natural rivers and streams, which are mostly meandering in their course to give the viewers the sense of unity with the rivers and streams to achieve effects out of imagination, especially the meandering water for the landscape in small size in the modern residential community. (Fig 5)

- To construct virtual and real landscape

  In places short of water sources, the virtual waterscape is also a very good resolution. We make use of the real items in garden building such as the rocks, tress, and grass, and fit in small quantity of water or even fake water effect created by simulating the shape of the natural water. It will not only achieve the water effects as a solution to the scarcity of water, but also give people room to imagine with the virtual waterscape, and meet people’s wish of getting close to water, which is a way out of killing two birds with one stone.
6. Conclusion

In the present situation of our country’s landscape construction, the waterscape is still the most energy-consumed and water-consumed. Today, the scarcity of water in gradual process has become a global problem, so each landscape designer should take the responsibility of the construction of a beautiful and agreeable waterscape, as John Symonds once said: We can admit, the landscape designers’ sole goal and work is to help the human beings, making man, buildings, communities, cities and their lives in harmony with the earth they’re live in.

References

[1] Liu Binyi. Planning and Designing of the Modern Landscape. Southeast China University Publishing House; 2005.
[2] Niu Feng, Niu Zehui, Cao Huafang. Planning and Construction of the Waterscape Gardens. Chemical and Industrial Press; 2006.
[3] Rees, Li Luming. Designing of the Interior Waterscape Gardens. Tianjin University Publishing House; 2003.
[4] Yvonne Rees, Peter May. The Yard Waterscape Garden Designing. Tianjin University Publishing House; 2003.
[5] Liu Binyi. The Landscape Planning and Designing at the City Waterfront. Southeast China University; 2005.
[6] Yu Kongjian. Landscape: Ecology-Culture-Perception. Beijing Scientific Press; 1998