

# Practical Thinking on Landscape Renovation Design of the Riverbed and its Surrounding Areas of the Jiang River in Shiyan City

Jie Qiu, Yijie Hu

School of Art and Design, Wuhan Textile University, Wuhan Hubei, 430073, China

**Abstract.** Based on the concept of common life between man and nature, the paper aims to guide people to deeply feel the nature. It combs and analyzes the landscape cases of the Jiang River by means of literature research and observation to achieve the transformation and upgrading of the stereotyped river landscape into the organic combination of art and nature. In the study, it is found that to achieve the ideal landscape effect, the transformation should be based on the concept of returning to nature, and the natural landscape conditions of the research objects should be combined to strengthen or weaken the characteristics of the base.

**Keywords:** Returning to Nature; Land Art; River Reconstruction; Landscape Design.

## 1. Introduction

River landscape environment provides leisure and social interaction functions in human settlements, and has been an important part in human life history for thousands of years. However, traditional river reconstruction mostly takes the original function of the river as the only starting point, and ignore the fact that landscape design leads to the problems hard to solve, such as insignificant water quality change and poor landscape effect after reconstruction.

In this paper, the landscape elements of the Jiang River are analyzed. As a complicate complex, the landscape of Jiang River aims to create a charming waterfront with water conservancy function by using natural landscape and protection measures, which is not only an innovation of traditional river landscape design, but also an attempt to return to nature and ecological management.

## 2. Sources of the Problems of Natural Riverbed Landscape

Due to the shortage of urban land, the linear design of the river has been encroached, and the width of the river has become increasingly narrower. To achieve flood discharge, only the straight riverbed can be taken to deepen the river. The declining ecological function and the neglect of revetment, natural characteristics and other factors lead to the lack of awareness of ecological protection from the beginning of the river course design, and it is more difficult to integrate the river course with the surrounding environment after its completion.

Based on the above-mentioned problems, the Jiang River with well-preserved natural landscape is selected as the research object, with the hope of get some enlightenment.

Jiang River is located in the west of Shiyan City, with a total length of 35 kilometers and a drainage area of 326 square kilometers. The annual runoff of self-produced water is 97 million m<sup>3</sup>, which belongs to the seasonal river in mountainous areas. A total of 150,000 people live in the drainage area. In addition to the basic river function, the concept of returning to nature should be applied to landscape design to form a complete river scenery. But before that, we should analyze the existing problems of Jiang River.

Problems can be divided into two aspects: unreasonable river landscape planning and deterioration of water quality.

In the original planning of Jiang River, there are still some shortcomings in dealing with landscape functional zoning. Water quality is an important prerequisite for landscape design. Compared with ten years ago, the water quality and landscape of the Jiang River has achieved qualitative change, but there are still scattered problems. The causes are analyzed as follows.

1. Theoretically, water pollution originates from suspended matter and dissolved matter in water, and the pollution of Jiang River belongs to dissolved matter pollution. There are some farmlands in the upper reaches of the river. Nutrients such as nitrogen and phosphorus in agricultural wastewater cause algae to multiply rapidly, causing poor water quality. The middle and upper reaches of the river are mainly polluted by organic matter in dissolved matter, which is caused by the illegal discharge of industrial wastewater by enterprises and domestic sewage by residents. The pollution destroys the water quality and landscape environment of the Jiang River.

2. Incomplete drainage facilities and lack of pipeline purification countermeasures. When treating domestic sewage, it should be purified and then discharged. Due to the lack of control, only a few pipelines in the basin are provided with contact filter materials, and there are no maintenance measures, so a large amount of sewage is directly discharged into the river. The aging of supporting facilities and insufficient investment have aggravated the environmental pollution of the Jiang River.

3. The most intuitive response of the landscape of the Jiang River is that there is "less hydrophilic space and no guarantee for safety". It is expected that revetment and other buildings will be added to improve its hydrophilicity, and protect and enrich the river ecosystem. Due to the lack of revetment, the riverbank is easily eroded during the wet season from May to August every year, and the near-water soil has neither the flood control function nor the supporting point for people to contact with water, let alone the impact of revetment materials on landscape charm.

### **3. Overview and Evolution of the Existing Landscape of the Jiang River in Shiyan City**

The evolution of the landscape environment of the Jiang River in Shiyan City can be divided into three stages.

The first stage was from 1969 to 2012 when a number of enterprises such as the Second Automobile Factory were built there. Due to the historical problems such as building factories first and then building cities, and the congenital deficiency of infrastructure and underground culvert facilities in Shiyan City, the Jiang River became a class V river with poor landscape environment.

The second stage is from 2012 to 2018. During this period, the landscape development of the Jiang River was tortuous and repeated, but the overall situation continued to improve. During the period of land reclamation by nearby residents, the land quality declined. Besides, the landscape was greatly damaged, and the water quality was seriously polluted. With the establishment of the western sewage treatment plant and the renovation policy issued by the government, the water quality has been greatly improved. The two-year spontaneous recovery of Jiang River began.

The third stage is from 2019 to now. After completion, the Jiang River trail and the little square provide leisure and entertainment places for the surrounding residents. The contact between the Jiang River and residents becomes more and more frequent, and its natural landscape is beginning to glow with its original vitality. Artificial traces and primitive nature gradually spread this land with their own strength.

### **4. The Value Shaping of Landscape Design of "Returning to Nature"**

1. A new perspective of river and riverside landscape design

Common river design tells the story of "flood control, drainage and water diversion". But the hidden meaning of man and nature is the logical starting point of landscape design returning to nature: the appearance of the sun, moon and stars, the cycle of day and night, and the change of seasons all indicate the existence of a natural law that regulates all forms between heaven and earth. It is undeniable that the landscape lies in nature.

When "returning to nature" becomes the theme, it is not difficult to find that there are too many rigid artificial elements in the former riverside landscape design. Can we cooperate with nature to plan a vibrant landscape environment suitable for human culture? Instead of blindly replacing natural

features with artificial landscapes, it is better to carefully arrange structures with the help of original rivers and vegetation, so that they can be integrated into the landscape.

## 2. Establishing the main position of "returning to nature" in riverside landscape design

If the original ecological landscape of the Jiang River is preserved and restored, and the artificial traces tend to be mild, the idea of returning to nature will occupy the dominant position in the landscape design of the Jiang River. The design of returning to nature serves people, with the aim of planning a suitable living environment. It emphasizes the protection of important and unique natural landscapes, and consciously and wisely guide the landscape design of the Jiang River to a new system, thus improving the relationship between man and landscapes. Returning to nature is a relative point of view, aiming to keep the original landscape of the Jiang River as much as possible on the premise of ensuring people's basic functional requirements for the river.

## 3. Harmonious landscape complex

(1) River landscape is inseparable from revetment, and the selection of revetment materials should be based on the study of durability, construction performance, economical efficiency and impact on ecological landscape. The revetment design with the theme of returning to nature focuses on the use of natural materials with high strength and excellent durability, such as block stones, pebbles and wooden stakes, which is more suitable from the perspective of landscape and at the same time improves the anti-erosion ability of revetment and provides living space for coastal animals and plants. The upper reaches of the Jiang River have deeper water depth and wider river width, and aquatic plants such as duckweed and reed grow on both banks, which can provide habitat and foraging home for animals. Besides, their leaves and stems have aeration tissue, which plays a role in purifying water quality. Therefore, in the design of ecological revetment, it is hoped to combine the coastal aquatic plants with the concave-convex surface of natural stone to show the change of waterline shape given by plants in natural state, enhance the coherence and balance between landscapes and create a revetment landscape with strong natural atmosphere.

(2) The waterside trail is also an important factor to be considered. Border fuzzy method can be used for roads along the river, and the fuzzy boundary of plants growing on the revetment can be used to form a landscape with natural customs. Because the paving materials are limited by terrain, landscape and other factors, different paving schemes should be matched for different sections of the Jiang River, such as hydrophilic platform, which can be paved with the original sand. Compared with artificial materials, it is characterized by strong water permeability, effortlessness and softness when walking. In the application of eco-trail materials, stones and bricks can be combined for pavement. According to the twists and turns of terrain and landscape, waterside plate can be used in some sections, so that it seems to grow from the environment and becomes a natural organic component.

(3) Green planting is the most basic condition for the landscape of the Jiang River. Green planting in the concept of returning to nature refers to the original vegetation in the site. However, natural factors also have advantages and disadvantages. To improve the landscape quality, it is necessary to eliminate or introduce them to strengthen the landscape characteristics of the basin. For example, the flowering evergreen plants, such as scallions and pittosporum, on both sides of the Jiang River, give people a pleasing feeling. It is necessary to create favorable environmental conditions for the growth of green planting, while weeds and dead branches are negative factors, which weaken the landscape effect and can be eliminated. Every spring, summer and autumn, people exercise and enjoy the natural scenery along the Jiang River trail. Many parents like to take their children to play in the shallows. Therefore, the landscape of hydrophilic space needs to be planned emphatically. The path formed by people walking on the ground for a long time has opened up several best shortcuts for the hydrophilic platform, with fine sand, green grass and river water on both sides. The rocks beside the path allow people to sit down and rest. By endowing natural objects with functional attributes, rocks, green plants, fine sand and river water constitute a harmonious composite landscape.

(4) Infrastructure is also very important. Benches, garbage bins and the little square are all facilities that can improve the landscape environment of the Jiang River. The benches should be located at a position overlooking the river, and materials with high integration with the environment, such as

natural stones with high suitability and strong stability or outdoor chairs, should be interspersed to meet the needs of different age groups. Trash bins should be natural and simple in shape, and placed at nodes such as squares and river entrances and exits. The Jiang River trail is located as a place for residents to exercise and rest nearby, which is not easy to produce a large amount of non-degradable garbage. A garbage bin can be set every 300 meters, and the garbage bin and toilet can be bundled when conditions permit. The little square is the most frequent place for social entertainment in the whole river course. It should be close to the river entrance and residential area, which is safe and can improve the utilization rate.

(5) To achieve the goal of building a harmonious landscape complex, the idea of returning to nature should be well promoted among the residents in the basin. Signs and guide plates can be used to transmit river information to residents, and form composite functions with other facilities, thus playing a role in improving river landscape. Considering the water pollution problems of the Jiang River basin, signs and guide plates can show people the water quality, seasonal flow and other data, thus enhancing residents' awareness of environmental protection, flood control and disaster prevention and improving their understanding of the Jiang River.

To sum up, the characteristics of the concept of returning to nature in river landscape design are as follows: first, most of the landscape environment is a composite landscape system composed of the original vegetation of the base. Second, the land of different areas faces different functional requirements. Relying on rational planning of the original landscape, the cost of artificial resource allocation can be reduced. Third, we should make use of the natural landscape to strengthen the local landscape characteristics of Jiang River. Fourth, small river scenery should be designed on the principle of returning to nature and according to people's needs. When the landscape design retains the natural characteristics of the base in the planning and configures the relevant infrastructure, the river course design may be freed from the sameness and enter the development and transformation mode of organically combining with nature while retaining its own characteristics.

## 5. Enlightenment of "Land Art" Design on River Landscape Design

Through the process of landscape reconstruction in the Jiang River Basin, we can obtain the following research results and enlightenment.

1. Developing according to local conditions and cherishing characteristic natural landscape resources

The real river landscape design is not simply copying the commercial river landscape development model, but more importantly, cherishing the unique value of each piece of land resources, strengthening the reservation in design, abandoning the reliance on the design method of "artificial landscape" to solve landscape problems, and paying more attention to the low-cost and irreplaceable natural ecological landscape. This will also become the potential that can not be ignored in the future development of river landscape.

2. Promoting the formation of river landscape culture to benefit residents in the basin

River landscape complex is an important public activity platform for human settlement environment. Good river landscape design should form high-quality landscape culture, radiate community residents, draw closer to the city soul, arouse people's attention to living environment, endow landscape with love, labor and art, and make magnificent or barren natural landscape show all potential rich connotations and exert positive influence.

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