

LETTER TO THE EDITOR

River Environmental Plane Design Under the Perspective of Ecological Landscape Theory

Xiaoling Sun*

Information Engineering Department, Yantai Vocational College, Yantai 264670, China

*Email: ytzyxysxl@163.com

In order to give full play to the important role of river landscape, this paper takes the process of comprehensive management of urban river and water environment at home and abroad as the starting point and the demand of river water environment management. Based on the ecological landscape angle, in order to respect that natural and improve the ecological environment as the basic principle, in order to build a good urban river ecosystem and promote the integration of human and water into the urban landscape as the ultimate goal, comprehensive landscape layout, river bank protection design, landscape traffic design, structure design and other related theoretical knowledge, the paper discusses the water, the revetment, the waterfront construction, the traffic element and the landscape element of the urban channel landscape, which can provide reference for the landscape design of the urban river.

Ecological landscape theory; River course; Environmental plane.

1 Introduction

As the process of the urbanization of the human society is moving forward, the river will undoubtedly become the necessary environment and resource carrier, and at the same time, it is very important to promote the urban development and to beautify the urban environment. Since the development of human society, water conservancy project, as the product of the struggle between man and nature, plays an important role in economic and social development. There is no doubt about (Guo et al. 2018). The social progress and the design concept of water conservancy project should also be developed. At present, the construction of urban areas in China only uses water conservancy projects as flood control and drainage, neglecting the requirements of urban water conservancy ecology and landscape. However, the present water conservancy bank protection is rigid, stiff, channelized and hardened, and the design style of modern urban space is also incompatible with modern urban space. As an important part of urban landscape, river system is not only the key element of urban system development, but also the daily life and production, entertainment and leisure of residents are closely related to the existence of river course. In recent years, due to the acceleration of economic development and socialization, the material life and spiritual life of human beings have been greatly improved, and as the root of life and wealth-rivers, it has not been treated and protected by human beings (Sun et al.2017).

Wei Li published an article in 2019 in the journal Ekoloji, Issue 107, entitled "Prediction Method of River Landscape Eco-Environmental Water Demand based on BIM Model." Taking a river basin as an example, the ecological water demand of river landscape is estimated, and the ecological water demand of river with different

levels and different preservation rates is analyzed. The hydrological model SWAT is used for prediction. The results show that the ecological water demand of river landscape is $81.09 \times 106\text{m}^3$, and the self-purification degree is w . Demand is an important part of river ecological water demand. Therefore, the control of pollution is the key to ensure the ecological water demand of the basin. Through further control of pollution, it is predicted that the ecological water demand of river landscape will continue to decline in 2020 and 2030. The natural runoff of the river can meet the ecological water demand of the first river. There is a serious ecological deficit in the annual flood meeting, which requires ecological replenishment of rivers. On the basis of determining the water quantity of the river, the plane environment of the river can be designed.

The advanced “ecological water conservancy” or “environmental waterpower” phase of some western countries is all the countries and regions with early completion of the industrialization process, and the management of the river has reached a new peak. The important characteristics of river landscape construction in this stage are as follows: following the law of natural ecology, starting from the actual demand, paying attention to the protection of natural ecology of river landscape and the protection and restoration of the surrounding natural environment (Duan et al. 2018). From the current development of our country, simply emphasizing the function and form, as well as increasing the development and utilization of the surrounding plots in order to pursue commercial interests, on the contrary, intentionally or unintentionally ignore the humanized design and historical and humanistic connotation. It has become a common problem in the landscape design of rivers and rivers in China. If the environment is improved, the function of the river channel cannot be realized, the landscape image level can be improved, the hydrophilic requirement of the urban residents can be met, the commercial value added and the urban competition index can be greatly increased, and fully stimulate the attention of the human to the scientific development and protection of the river channel. Based on this, this paper puts forward the plane design of river environment from the perspective of ecological landscape theory (Marcela Martinez-Lara and Paez Melo 2017, Fuentes Rivas et al. 2017, Carrillo Pedroza et al. 2017).

2 Idea description

2.2 Study on Urban River Landscape Design

First, the river barge bank virtual and real treatment work. In view of the design of the urban river bank landscape, we can take into account the reality and the false view from two aspects. What we are talking about is to express the scene through a certain hard landscape, such as some garden buildings, creative environmental space landscape and so on. These hard landscapes can show strong functional and scale, and in the course of concrete design, we should be aware of the relationship between the plant and the landscape architecture. By virtual scene, we mean that some different types of plants which can be planted in the shoreline environment where the river flow is relatively smooth, and different artistic collocation can be carried out according to the changes of plants in different seasons. We do this kind of work in order to be able to create a rich plant landscape group, and to combine these plant landscape with the reflection of the water, produce rich changes, and echo (Han et al. with other architectural landscapes. 2018).

Second, the construction method of urban river plant landscape. The construction of natural ecological environment in urban river landscape is an important aspect, and the construction of plant landscape is the most important thing in the construction of natural environment. We should pay attention to the setting of plant landscape group and open the space green space, pay attention to the allocation of Arbor, irrigation, grass and plant modeling, coordinate with each other in detail and overall, and combine local plants closely with foreign primers. In addition, it is necessary to reflect the diversity characteristics of plants, and pay attention to seasonal

clarity, to achieve the principle of three seasons with flowers, four seasons have green, science and design art will be integrated and permeated.

2.3 Overall design of urban river courses

(1) The plane layout of urban river landscape

The layout of the urban river course should be in accordance with the local conditions, keep the natural shape of the river as much as possible, avoid the design of the straight line, and do not need a parallel and uniform width water surface to ensure that the original natural bending shape is kept as far as possible, The invention not only has the characteristics of its own, but also has the alternate depth, which provides a good living environment for various organisms, so as to protect the diversity and the comprehensive of the riverbank biology, and guarantee and promote the aesthetic value of the river channel landscape. The layout of urban river course must be carried out closely in combination with the actual terrain, and the regional layout should be carried out scientifically and reasonably. if the landscape river course is banded linear layout, we should pay attention to continuity and echo with each other. The node design should be concentrated, optimized, and the design should highlight the bright spot of the theme. The location of the node should be considered comprehensively, which needs to be combined with people's traffic and many other factors to form the visual guidance between the functional areas.

(2) Design of urban river bank protection

The design of the bank protection is often the most important point in the landscape design of the urban river, and it is a most difficult point in the design. Comprehensive consideration should be given to the overall landscape design in the design of revetment engineering (Sun 2017). The cross section along the river should be slowed down as much as possible, and the embankment should be as wide as possible. The treatment of barge is based on the actual soil course, rather than the traditional design concept of rectangular or ladder section, and try to replace the hard slope protection with soft slope protection. Maintain ecological function and aesthetic value and reduce engineering cost. The gentle slope can be considered to maintain the natural state, combined with vegetation planting. The common forms of revetment include rock revetment type, wood revetment type (real wood and imitation wood) type, ecological revetment wall type, tire revetment type, dry masonry slope protection type and so on. Generally speaking, it can be divided into two kinds: artificial slope protection and ecological slope protection. Artificial filling revetment section can be divided into vertical barge type, gentle slope revetment type, graded revetment type and other types according to its manifestation.

(3) River landscape traffic design

Because the traffic road is connected with many elements in the river landscape area, it is said that the traffic facilities are directly related to the waterfront behavior of the residents. The design of traffic facilities in the landscape design of the river course should be put on the rational traffic organization and the scientific road design.

(4) Structure design of urban river course

The buildings and structures near the river landscape, including bridge structure, riverside architectural design, etc., combined with the actual environmental conditions and the surrounding architectural forms, should maintain the regional continuity of the overall style of the building. As one of the important components of urban river landscape design, the formation of bridge scale will greatly enhance the personalized characteristics of unique waterfront space. As an important component of river system in urban public space, the design and structure of bridge should have distinct personality characteristics, and the coordinated regional landscape should be reflected in the shape of bridge, the use of materials and other designs.

2.4 Elements of river landscape design

(1) Water

The calm water area can map the depth and level of the natural scene and enhance the sense of space; the flowing water reflects light and shadow transformation, which can be used as a dynamic supplement to the surrounding buildings, so that the line of sight on both sides of the strait has a more sense of light and volume.

(2) Revetment

Non-structural waterfront barge is a slow slope revetment formed according to the natural model according to the natural material, but it will be divided into natural and bioengineering revetment according to the intensity of human interference factors. According to the principles of structural mechanics, the use of wood, stone, cement, concrete and other materials, combined with plant cultivation to ensure the formation of revetment, including concrete members revetment and so on.

(3) Waterfront building

The influence of architecture on waterfront landscape is mainly reflected in the treatment of building entities. Waterfront building is one of the important elements of river interface. In principle, efforts should be made to coordinate with the local construction style (Huang 2017).

(4) Traffic elements

The design of traffic in riverside open space should provide hydrophilic space to the public to the maximum extent, and every public space, wharf, platform and hydrophilic trestle runs through the route of people's daily work and life. Create a safe and comfortable walking space.

(5) Landscape elements

According to the needs of human beings, the vertical plane is delineated in the limited space by using the different states of the plant, so as to create a space atmosphere in which the body and mind relax and enjoy the nature. Continuous greening can be based on a wide range of water surface, and rich green plants can be set off according to the environmental changes on both sides of the landscape river.

3 Results

The landscape layout is as follows:

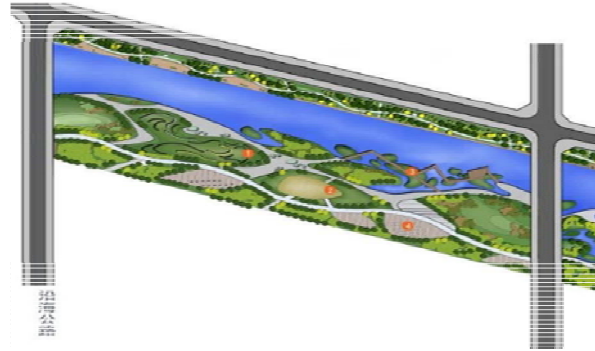


Fig. 1 River environmental plane

4 Discussion

- (1) Through the comprehensive comparison and analysis of domestic and foreign literature, this paper introduces in detail all kinds of theoretical knowledge related to urban river landscape, and constructs the basic theory framework of urban river landscape design.
- (2) The emphasis of urban river landscape design is the ecological landscape strategy of urban river course, which should follow the principle of ecological design and construct and develop the urban river landscape.
- (3) River design should be subject to the requirements of urban master planning, green space system planning and other upper planning.

5 Conclusion

The urban channel water environmental management in China is a complex project. We want to use a variety of measures to improve the water environment of the river channel, changing the concept on the basis of improving the water environment, realizing the value of the river landscape, grasping the natural beauty and the ecological beauty of the river. And then the beautiful river landscape is designed. On the construction of river landscape, many scholars have carried out a lot of related research and analysis. At present, most methods still in the initial stage, the river landscape design is also in the simple concept and the idea design stage, the specific detail design put forward often starts to pay attention from the point, not from the ecological angle, The logical relationship between the river ecosystem and the landscape restoration has not been fully considered. Therefore, to some extent, the systematic concept of river landscape construction in China has not yet been formed. In theory, there is still room for further improvement and exploration.

Acknowledgement

The work was supported by 2018 Shandong University Humanities and Social Science Research Program Project - Research on the Eight Immortals Culture Based on Digital Media Technology and Inheritance and Innovation (No. RW2018ZBH001).

References

- Carrillo Pedroza FR, Soria Aguilar MDJ, Sanchez Castillo MA, Martinez Luevanos A, Picazo Rodriguez NG (2017) Adsorption of chromium from steel plating wastewater using blast furnace dust. *Revista Internacional De Contaminacion Ambiental* 33 (4):591-603.
- Duan DY, Qin CX, Ma H, et al. (2018) Analysis of landscape elements of marine pastures from the perspective of landscape ecology. *Marine Environmental Science* 37 (06):52-59.
- Fuentes Rivas RM, Santacruz De Leon G, Ramos Leal JA, Moran Ramirez J, Martin Romero F (2017) Characterization of dissolved organic matter in an agricultural wastewater-irrigated soil, in semi arid Mexico. *Revista Internacional De Contaminacion Ambiental* 33 (4):575-590.
- Guo LF, Zhang H, Liu MZ, et al. (2018) Study on the evaluation system of eco-environmental benefits of comprehensive river regulation in rural areas. *Journal of Ecology and Rural Environment* 34 (5):474-480.
- Han Y, Piao XH, Liang Q (2018) Landscape Planning practice of Urban Water system from the Perspective of Urban Shuangxiu-A case study of Water system connected Ecological Planning in Xinxiang City. *Chinese Garden* (8):27-32.
- Huang WW Research on Architectural Space Environment Design based on Virtual reality Technology. *Automation & Instrumentation* 2017 (4):31-33.
- Marcela Martinez-Lara J, Paez Melo MI (2017) Design of experiments applied in the optimization of the extraction method of organochlorinated and organophosphoric pesticides in soils. *Revista Internacional De Contaminacion Ambiental* 33 (4):559-573.
- Sun Y, Zhang B, Sun DP, et al. (2017) Eco-environmental problems in river regulation and eco-coordinated river regulation. *Water Conservancy and Hydropower Technology* 48 (5):102-109.
- Sun ZY (2017) Study on the Development and Protection of Rural Landscape from the Perspective of Ecotourism-A case study of Guangxi. *Agricultural Resources and Regionalization in China* 38 (8):209-213.