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Research Article

Importance of Water Ecological Environment Protection in Urban Landscape Design

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With the continuous acceleration of urbanization, urban construction has gradually become an important factor to promote the development of productive forces, the construction level of first-tier cities in China is higher than that of second-tier cities, and the economic volume is about several times that of other cities. Therefore, urban construction is an important factor to promote productivity. As a special regional type, a city watershed is a complex system with integrity and regionality. The particularity of urban watersheds lies in the fact that cities are characterized by the aggregation of elements. Cities are not only areas with densely populated population and buildings, but also the concentrated places of production, consumption and exchange. The development of cities is dynamic and diverse. The city ecological elements in the watershed are closely related, and the upstream and downstream regions are inseparable and affect each other. The current issues in the administration and conservation of the river basin's water environment are due to conflicts of interest between the upstream and downstream of the city river basin, as well as between numerous departments. The conflict of interest and conflict of interests between the upstream and downstream of the urban watershed and various departments is the difficulty in the management and protection of the water environment in the current watershed. Water environment security means that there are clean and sufficient water resources to meet the needs of human survival, to meet the needs of social progress and economic development, and to maintain a good ecological environment. Water ecology refers to the influence of environmental water factors on organisms and the adaptation of organisms to various water conditions. Urban greening and landscape design are of great significance to the improvement of the ecological environment and the realization of sustainable urban development. This article takes the ecological landscape of a certain area as a research object to study the complexity, diversity, variability and other characteristics of modern ecological environmental problems, and analyzes the relevant situation of water pollution in the landscape ecological environment. The research shows that: permanganic acid in the water body around the lake The salt index, COD, BOD5, total phosphorus, and total nitrogen cannot meet the requirements of the Class III water environment functional zone. Among them, the highest pollution of the permanganate index is the W10 monitoring point, which exceeds 1.98 times, and the second is the W8 monitoring point, which exceeds 1.65 Times; COD pollution is the heaviest at the W7 monitoring point, exceeding the standard by 0.56 times; BOD5 pollution is the heaviest at the W8 monitoring point, exceeding the standard by 0.39 times; the heaviest total phosphorus pollution is the W11 monitoring point, exceeding the standard by 19.90 times. From the water quality testing data, it can be concluded that the water quality of the landscape area is seriously polluted, which seriously affects the drinking water safety of residents. In the process of modern urban garden landscape planning and design, only full use of ecological concepts can reduce the consumption of natural resources, avoid damage to the original ecological environment, and provide a more comfortable and healthy living environment for the people.

1. Introduction

Water ecology refers to the influence of environmental water factors on organisms and the adaptation of organisms to various water conditions. Life originated from water, and water is an important component of all living things. Organisms continuously exchange water with the environment, and the quality (salinity) and quantity of water in the environment are important factors in determining the distribution of organisms, the composition and number of species, and their way of life. The PH of water quality between 6.5 and 9.0 can be used for freshwater aquaculture. If the PH exceeds 9.5, it is harmful to most living things in the water. Therefore, maintaining good water quality can be beneficial to the growth of aquatic life, and vice versa. Water environmental protection of transboundary rivers is a difficult point in river basin management, and it is also an important factor that restricts the coordinated development of social economy and environment in the river basin. Transboundary rivers are rivers that flow through different countries or regions. These rivers include international transboundary rivers and regional transboundary rivers. As a special regional type, a watershed is a complex system with integrity and regionality. The ecological elements in the watershed are closely related, and the upstream and downstream regions are inseparable and affect each other. In particular, the upstream and downstream of transboundary rivers have issues related to water resources allocation and water environmental protection. Through the protection of water resources, the needs of the society for freshwater resources to achieve sustainable economic development can be met. The objects of water resources protection include the quantity and quality of surface water and groundwater. As local governments pursue the maximization of local interests, conflicts of interest between different administrative regions and upstream and downstream of the river basin have appeared, which is the management and protection of water environment in the river basin. The crux of the problem and the difficulty lies in it. In recent years, China's economy has shown a trend of rapid development. Due to the rapid economic development, the level of urban industrialization has also continued to increase. Excessive development and construction have caused serious damage to the ecological environment, and China's urban environment has been seriously polluted. Therefore, in the future development, the attitude of sustainable development should be maintained. In the process of urban landscape design, the concept of the ecological environment must be fully integrated, and the protection of the ecological environment must be given top priority.

In recent years, there have been many sudden water pollution incidents in the river basin. Among them, the antimony pollution caused by the pollution discharge process of textile and other related industries in the basin has a greater impact on the water quality of the river. Because antimony (Sb) is a metal-like element with potential toxicity and carcinogenicity, and its chemical properties are similar to those of arsenic (As). Antimony pollution caused by natural processes and human activities has been widely found in water and soil environment, which will seriously affect aquatic organisms and soil organisms. The indirect contradiction between the demand for water quality of river water supply and the development of industries along the river basin has become increasingly prominent. Antimony entering the water is toxic to algae at concentrations starting at 3.5 mg/l and to fish at 12 mg/l. The toxicity of antimony is similar to that of arsenic. The toxicity of trivalent antimony compounds is stronger than that of pentavalent antimony, the toxicity of water-soluble compounds is stronger than that of insoluble compounds, and the toxicity of antimony element dust is stronger than that of other antimony-containing compounds. When sudden pollution incidents occur, local governments require some industries to suspend or limit production, which also affects industrial development and local economy. However, the textile industry gathered in the upper reaches of the river has a long history of development and significant economic benefits. It is a pillar industry in the upper reaches of the river. The operation of these textile industries will cause certain pollution to the water environment. Therefore, the watershed management departments and upstream and downstream stakeholders have an increasingly urgent need for cooperative protection of the river water environment. The improvement of the ecological environment is of great significance to the realization of sustainable urban development. The full use of ecological concepts can reduce the consumption of natural resources to a large extent, avoid the damage to the original ecological environment, and provide the people with more comfortable and healthy Living Environment.

According to the research progress at home and abroad, different scholars also have certain cooperative research in urban landscape design: Dan Meng and others chose Landsat 8 satellite to invert the surface temperature (LST) of the five major cities of Beijing, Shanghai, Guangzhou, Tianjin, and Chengdu, and applied three methods: quantification of the intensity of heat islands in the surface city, measurement of landscape pattern, and spatial autonomy. Related. The research by Meng et al. [1]. Based on the class and landscape-based metrics, the pattern of the thermal landscape can be detected. The debris rates at low and high temperature levels are very low. The blue I map can detect several high and low star clusters, which are the main types of thermal landscapes. In order to ensure the ecological safety of the Nansi Lake Basin, Yan et al. [2] Used the land use data from the 1980 to 2015 period of the basin as the basis, analyzed the landscape pattern changes in the Nansi Lake Basin by calculating the landscape pattern index, and used the landscape adaptability (LAI) and The Landscape Sensitivity Index (LSI) constructs the landscape pattern vulnerability (LVI) and analyzes its spatial distribution and changes. It is the most commonly used quantitative research method in landscape ecology to describe the landscape pattern and change with landscape index and establish the connection between the pattern and the landscape process. The research results of Yan et al. Showed that: From 1980 to 2015, the proportion of cultivated land area in the Nansi Lake Basin decreased by 4.6%.

Construction land increased by 39.7%, other land use types fluctuated, forest land, grassland, unused land area decreased, water area increased, cultivated land has always been the dominant landscape type in the Nansi Lake Basin; cultivated land and water area fragmentation increased, other land types The degree of fragmentation is reduced, and the overall degree of fragmentation of the watershed landscape is alleviated. There is better connectivity between landscape types. The irregularity and complexity of the landscape pattern are reduced and it is developing towards uniformity and diversification. Tang et al. [3] Used the existing land use data of Haidian District in Beijing to estimate the regional ecosystem service value of Haidian District at a grid size of 500 m × 500 m. Based on the distribution of ecosystem service value, the research area was divided into For different types of zoning, GIS and FRAGSTAS software were used to analyze the land use structure and landscape pattern of different zonings. FRAGSTATS landscape pattern analysis software is characterized by using the integrated analysis environment of landscape index, without having to write related algorithms and read/fetch files by itself. The research results of Tang et al. Showed that the main The types of land use are urban green space in high-value areas, cultivated land and forest land in medium-value areas, and construction land in low-value areas; there are also large differences in landscape pattern indexes between different ecological service value zones, and the degree of landscape pattern fragmentation gradually increases from low value areas The high value area indicates that the impact of human activities on the ecological environment has increased, and the disturbance of human activities on the landscape structure has also increased.

This article takes the ecological landscape of a certain area as the research object, discusses the complexity, diversity, variability and other characteristics of modern ecological environment issues, analyzes the relevant situation of water pollution in the landscape ecological environment, and studies the sustainable development of cities and regions. The importance and necessity of multidisciplinary cross-disciplinary cooperation in ecology, environmental science, economics, sociology, etc., provide references for design, decision-making, construction, control and other departments, and provide empirical evidence for future ecological restoration construction Experience and suggestions for improvement, to improve the conflict between man and nature arising from the ecological protection of some landscapes at this stage. Comprehensively carry out environmental and ecological analysis in landscape design, and strive to transform the human living environment into a beautiful, sustainable and healthy living environment.

2. Proposed Method

2.1. Overview of Landscape Design. Landscape design: Landscape design, also called landscape architecture, includes natural elements and artificial elements. It refers to the overall consideration and design of the surrounding environmental elements in the process of architectural design or planning and design, so that the building (group) echoes the natural environment. Relationship, making it easier to use and more comfortable, and improving its overall artistic value [4].

2.1.1. Broad Landscape Design. Landscape design mainly includes planning and specific space design. Broadly defined landscape design refers to large-scale and large-scale landscape design. It is a kind of space building that combines the fields of transportation, water and electricity, gardens, municipal administration, architecture, etc., and through the rational use of land, builds a space building that meets the needs of customers and conforms to the nature of the place, and skillfully borrows nature to create a comprehensive ecological environment. It has contents: site planning, control planning and environmental planning. Site planning is to meet certain requirements, people make long-term, deliberate artificial transformation and utilization of land; control planning is mainly to deal with the relationship between land protection, use and development, including landscape geology, open space system, transportation system and many other units The relationship between the control; environmental planning refers to the planning and design of natural systems and environmental protection in a certain area, the purpose is to maintain the carrying capacity and sustainable development of natural systems [5].

$$\begin{aligned} B_k &= P^{eu_i} C\left(\phi_j\right)^K, \\ D_S &= QP\left(\beta_j\right)^C, \\ QL &= (GW + M), \\ H_E &= G^{W_0}. \end{aligned} \tag{1}$$

Formula: B represents the generalized landscape design, P is the evaluation index, C is the evaluation index, K represents the correlation index, QL represents the final design quality, G represents the score, W is the weight, and M is the weighted value.

2.1.2. Narrow Landscape Design. The specific space design links constitute a narrow concept of landscape design. Landscape design takes ecological thinking as the core, which is the need of objective reality. The main elements in the narrow landscape design include terrain, water, vegetation, buildings and structures, and public artworks [6].

$$\begin{aligned} C_0 &= Q^s T (M, N)^T \\ &= K (Q, J)^T, \\ D_1 &= E_S, \\ D_2 &= \left(E + T_S\right). \end{aligned} \tag{2}$$

2.2. The Meaning of Ecological Design. Ecologists Sirn-VandcrRyn and Cowan put forward the definition of ecological design in 1996: any design form that is coordinated with the ecological process and minimizes its damage to the environment is called ecological design [7].

$$X_j = X + \sum_{i=1}^{N-1} \frac{\kappa_i}{M},$$
$$D_{i,j,2} = (W + A). \tag{3}$$

The ecological concept is the concept of the coordinated development of man and nature, which permeates the design process so that the designer sees man and nature as a complete ecosystem when shaping material and energy, rather than "anthropocentric" or "natural determinism." The ultimate goal of design (anticipated need or desire) is to minimize the design with the help of natural forces.

$$M_{P,Q} = R^H,$$
$$M_N = M_0, \tag{4}$$
$$Y_{i,j} \in D_p^* (1 \le j \le N).$$

2.3. Relationship between Landscape Design and Ecological Design. To a large extent, landscape design directly changes the environment around us, and this change also changes the environment to varying degrees due to the size of the project. Although the landscape architect cannot completely view the design with a scientific perspective, the design The architect must understand science and understand the ecology; the beauty of form and vision is important in landscape design, but the designer cannot only pay attention to the beauty of form and vision in landscape design, and also consider whether this design plan will affect the environment and the environment. If properly designed, it can make the whole landscape look more comfortable, make it memorable, and thus attract more customers to watch it, which is of great significance. Ecology is destructive. A landscape design work that damages the environment must not be a good work. Such a work has great defects and is not designed in accordance with sustainable development strategies [8]. The water environment monitoring measures are shown in Figure 1.

Comprehensively carry out environmental and ecological analysis in landscape design, and strive to transform our human living environment into a beautiful and sustainable healthy living environment [9].

$$R_{i,j} = T_M,$$
$$KL = RY, \tag{5}$$
$$Q = \{H_1, H_2, H_3, \ldots, H_n,\}.$$

2.4. The Important Role of Modern Urban Landscape Design. According to the design theory of ecological aesthetics, in the process of urban landscape design planning, it is necessary to ensure the scientificity and rationality of landscape design. By organically combining architecture with the natural ecological environment, it can promote the design level of urban landscape It has been effectively improved, and in the process of urban garden landscape design planning, it can also meet people's spiritual life needs [10]. Because people live in the city every day, the huge work pressure can easily make people appear in a sub-healthy state, and the natural scenery of the garden landscape can keep people's body and mind happy, let people relax and relax, and enjoy a moment of life Interesting, so modern garden landscape design is not only an important part of the entire urban landscape planning, but also a mediator of the relationship between man and society, man and nature.

Comprehensive cost sharing model for river water environmental protection:

$$C = R \times K_1 \times K_2, \tag{6}$$

C is the cost of water environmental protection. K_1 is the water quality protection cost, K_2 is the environmental protection cost, and R is the correlation coefficient.

Water distribution coefficient:

$$K_V = \frac{Q_D}{Q_Z}, \tag{7}$$

Q_Z is the total amount of discharge at the junction of the main stream of the river.

Water quality correction factor K_Q:

$$K_Q = 1 + \frac{(P \times M)}{(P \times K)}. \tag{8}$$

Water benefit distribution coefficient:

$$K_E = (1 + UW)(P \times M) + \alpha (P \times K). \tag{9}$$

UW is the water consumption per 10,000 yuan of GDP in the lower reaches of the basin.

In the design of modern urban garden landscapes, cultural characteristics such as humanities and natural regions can be fully integrated to ensure that the design of modern urban garden landscapes is diverse and ecological [11, 12]. The so-called diversity refers to the protection of the diversity of the creatures in the area to avoid damage and impact on the original biological environment, including the protection of plant communities, the development of native plants and wild plants. In the process of garden landscape design, there should be some restraint, for example, when planting artificial grassland, the original wildflowers and wild grass must be properly protected, and the wetland ecosystem should be restored through the application of ecological theory To ensure that the landscape design protects the ecological environment; at the same time, the greening system and the garden landscape are organically combined to make the entire garden landscape a small ecological cycle system, so that the various populations within the ecosystem can be organically developed and protect each plant. Get along in harmony [13].

The ecological concept refers to the ecological protection of the natural environment and social environment by human beings, and promotes the harmonious development of man and nature, man and society. Therefore, the design of modern urban garden landscape through the ecological concept can ensure the garden landscape from the initial design to the final The construction can avoid damage and impact on the original natural ecology, and can also reduce the consumption of energy resources and ensure the harmonious coexistence

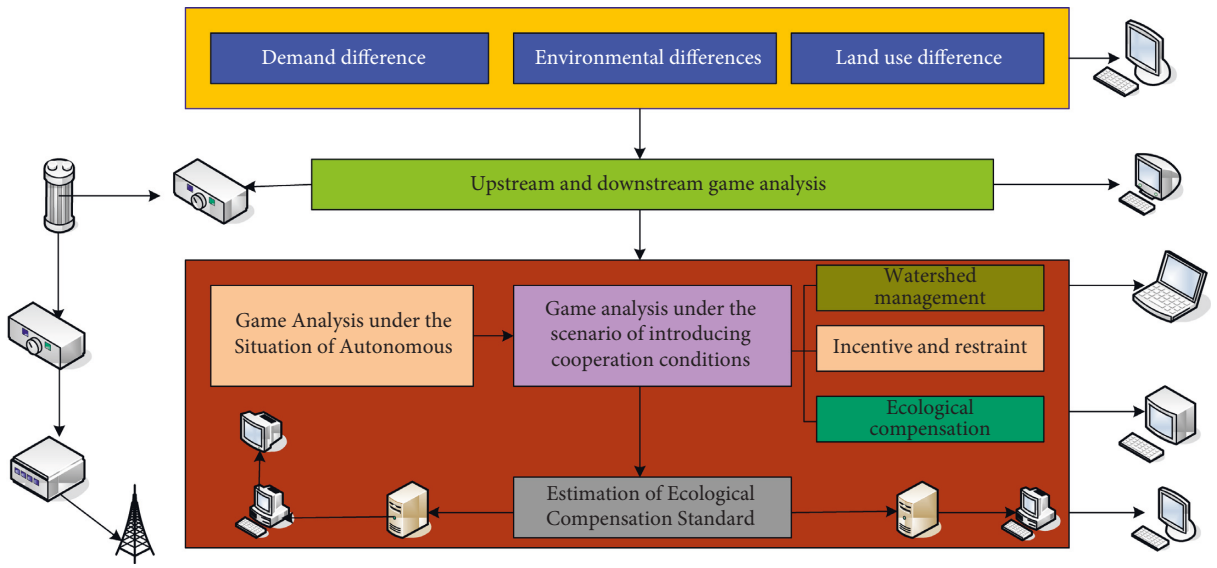

Figure 1: The water environment monitoring measures.

of man and nature. As the most important ecological system of a city, modern urban garden landscape can not only add more natural scenery to the whole city, but also bring about certain changes to the city's ecological environment.

However, in the process of ecological garden landscape design, various artificial objects are often used to replace the original natural environment, which makes the entire urban garden landscape design instability [14]. For example, the misuse of man-made landscapes such as various artificial rockery and water bodies will not only destroy the characteristics of the original natural landscape, but also affect the regional environment. Therefore, we must fully use the ecological concept to guide and plan the urban garden landscape design, and ensure that through the ecological garden design, we will create a pleasant physical and mental environment and living environment for people.

2.5. Problems in Landscape Planning and Design in Practice

(1) *Limitations of professional quality and level of designers and planners*. Some problems in practice are obviously related to the limitations of the designer's quality and low comprehensive ability, and the lack of professional knowledge and skills. The quality of landscape planning and design works is to a certain extent subject to the designer's professional level and literacy. Constraint [15].

(2) *Non-specialized intervention caused by administrative management*. At present, China's landscape planning and design industry is almost led by non-professionals. Professionals are the main performance of non-professional intervention in administrative management; related industry laws and regulations are ignored in administrative management, and the continuity of design works is randomly changed. The impact of sustainable development is also obvious.

(3) *The awareness of intellectual property protection is relatively weak*. Nowadays, imitating and plagiarizing other people's landscape and garden planning and design are prevailing. Intellectual property protection awareness is relatively weak in all aspects of society, and personal works are easily imitated and copied. Although the intellectual property law that has been formulated in China is relatively complete, from the practical operation process, the understanding of the importance of intellectual property protection of works is still insufficient, and the protection is not strong enough [16].

(4) *The traditional and modern understanding and handling in landscape architecture are not appropriate*. Now a days, there are fatal problems in imitating and copying landscape planning and design [17]. Lots of uncompetitive garden landscapes are made with the same space, instead of digging out its connotation on the basis of design thinking and inheriting traditional artistic techniques. Combine with the needs of modern society to carry out modern landscape architecture planning and design [18].

2.6. Ecological Design Principles of Contemporary Landscape Design

(1) *Respect for nature*. Nature has its own laws of evolution and renewal, and at the same time has strong self-sustainment and self-recovery capabilities. Ecological design should make full use of nature's initiative to achieve self-recovery of the ecosystem, respect the natural development process, and enhance the site's self-regulation, The development of sustainable, ecological contemporary landscape [19].

(2) *Minimal intervention and maximum promotion*. Landscape design is always carried out on a certain site, and human activities will inevitably interfere with

the natural environment [20]. Ecological design is to reduce disturbance to the site as much as possible, and strive to promote the material utilization and energy cycle of the natural ecosystem through design methods, maintain the site's natural processes and the original ecological pattern, and enhance biodiversity.

(3) *4R principle*. "4R" means Reduce, Reuse, Recycle and Renewable. "Reduce" reduces the use of various resources, especially non-renewable resources, and uses renewable resources cautiously; "Reuse" reuses the original landscape components of the base when it meets the engineering requirements; "Recy-cl" establishes recycling System, recycle recycled materials and resources; "Renewable" uses recyclable materials and retained resources to create new landscapes and serve new functions [21].

(4) *Adapting to local conditions and scientific planning*. In the preparation of green space system planning, it is necessary to plan an ecological green space system with a reasonable structure according to the principles of urban ecology, and balance the greening land indicators in the overall urban planning [22]. The new districts should keep enough greening land, and the old districts should find more greening land through renovation. Plan a number of public green spaces, street green spaces, scenic spots, and amusement parks to provide citizens with more places for leisure and entertainment [23]. In addition, strict implementation of the city's "greening" system, any violation of the planned green line should be given legal and economic sanctions.

(5) *Guided by science and technology*. Science and technology is the first productive force, making full use of the most advanced science and technology to serve landscape ecological design. The development of science has promoted the progress of technology, the use of high-tech technology to increase the utilization of resources, and the use of high-tech materials to reduce the use of resources creates high-tech landscapes with the help of technology [24].

(6) *The principle of moderation*. In the process of urban ecological landscape design, not only should it reflect the aesthetic value and function, but also have a certain applicability function, so as to meet people's aesthetic needs. Follow the principle of moderation in the specific design process. It is impossible to blindly increase the landscape design in order to pursue the effect. Excessive urban landscape design can not only meet the current development needs, but also cause certain obstacles to the development of urbanization [25].

(7) *Combination of artistic functions*. Design is an art subject, and landscape is a comprehensive whole. Designers should understand the ecological design of modern landscapes with the ideas of modern art, in order to create new modern landscapes that are full of artistic beauty and satisfy social functions.

2.7. The Practical Application of Ecological Concepts in Urban Landscape Design

(1) *The leading role of ecological concepts in urban landscape design*. The ecological environment determines the main tone of urban landscape design. In the future, urban landscape design should also carry out its own construction and planning on this main tone. This is not to obliterate people's creativity, but to embody people's creativity. The principled design is the creative design. If you let it take its course, the city's characteristics will inevitably reproduce the phenomenon of "the heaven and the sky." This will destroy the consistent inheritance of the city's characteristics and the original ecological environment. The main tone [26].

(2) *Coordination of urban landscape design and surrounding environment*. The landscape design of the city should be coordinated with the surrounding environment. Any landscape is a system, and this system exists in a larger system. Only when the two systems coordinate with each other can the two systems be long-term. Maintain a healthy development trend. If the two cannot coordinate with each other, it will cause both of them to be greatly affected, the internal self-renewal will become very slow, and it will also cause great pain to the organisms that depend on the system to survive. Therefore, in the urban landscape design, this system within the city must coordinate with the surrounding original ecological environment to establish an interdependent relationship, so that the surrounding original ecosystem can realize self-renewal and provide rich materials for the city. At the same time, the urban landscape will also benefit greatly from this dependence [27].

2.8. Development of Modern Urban Landscape Design under Ecological Concept

(1) *Focus on sustainable development and ecological principles*. In China's urban landscape design, we must pay attention to sustainable development and ecological construction. In ecological landscape design, the focus must be on the combination of ecological environment and design, which means that the potential provided by nature must be fully utilized, and landscape design must be strictly followed in accordance with natural constraints [28]. The materials used in the design should be recycled materials, try to use the original materials on the construction site for recycling, and maximize the functionality of the materials to avoid excessive energy consumption during production, processing and transportation, and Local traditional cultural characteristics are preserved. Pay attention to the design combined with nature, advocate a new design concept, and use this to form an ecological design concept, while following the ecological planning and

design theory, rationally planning and designing modern urban garden landscapes. Since ancient times, our culture has emphasized harmony with nature. However, in landscape garden design, it is often considered that just adding natural elements to the design does not effectively combine with nature. In order to achieve the scientific and rational design of modern urban garden landscape To promote the sustainable development of urban construction, designers must incorporate ecological planning and design concepts into the design, and on the premise of fully respecting the regional nature of nature and landscape gardens, look for design methods that are compatible with the local natural environment and urban development. And use local cultural characteristics in the design to enhance the functionality and aesthetics of landscape architecture [29].

(2) *Development towards diversification and technology*. An important feature in the development of modern cities is diversification. With the improvement of living standards, people's aesthetic outlook and life needs are also developing in the direction of diversification, which puts forward higher requirements for garden landscape design. Based on this, in the modern urban garden landscape design, the individualized landscape design must be continuously pursued and developed in the direction of refinement, so as to meet the increasing needs of people to the greatest extent. With the improvement of modern urban structure, as a large-scale comprehensive engineering project, landscape garden design also faces many problems in urban development. For this reason, designers must constantly update the concept of garden design and pay attention to ecological gardens. Design and continuous effective innovation have provided a reliable basis for the rationalization of landscape design. At present, with the continuous improvement of the development speed of the socialist market economy, the level of science and technology is also getting higher and higher, which provides scientific and technological guarantee for the development of modern urban landscape design. Advanced science and technology, advanced machinery and equipment are used to achieve optimized drawing Design and carry out the construction of simulated urban landscape garden, which is also the future development trend of urban garden landscape design [30].

3. Experiments

3.1. Overall Design

(1) *Design concept*. This article is designed to protect the ecological environment of the landscape, while following the principles of putting people first and continuing and digging deep regional cultural connotations. As part of the urban planning, the waterfront area should be coordinated with the city in terms of function, leisure and transportation, and strengthen the connection between the park and the urban landscape through special means. The water intake layout and water intake scale are shown in Table 1.

(2) *Design Features*. The design of this paper insists on protecting ecological nature and minimizing the impact of people on the ecological environment in hydrophilic activities.

3.2. Research Content. This article takes the ecological landscape of a place as the research object to study, discuss the characteristics of complexity, diversity and variability of modern ecological environment problems, and study the ecology, environmental science, economics, and society in the sustainable development of cities and regions. The importance and necessity of multidisciplinary cross-disciplinary cooperation, such as learning, to provide reference for design, decision-making, construction, management and control departments, and provide empirical evidence-based experience and improvement suggestions for future ecological restoration construction, and improve some of the current landscape The conflict between man and nature arising from the process of ecological protection. Taking into account the natural, social and economic status of *M* district, compare it with other districts, counties, and county-level cities. The main reference is population, administrative area, proportion of three industries, and regional GDP as shown in Table 2.

3.3. Research Methods

(1) *Literature research method*. Collect and sort out the research data on ecological planning and control and the theoretical data required for thesis writing, study the various types of planning and other relevant materials of the ecological landscape area selected in this article, and explore the theoretical and practical results of ecological planning and control at home and abroad in recent years.

(2) *Field survey method*. Conduct field research on the ecological landscape area selected in this article, focusing on the current characteristics of the ecological landscape area of lakes, wetlands, arable land, animals and plants, forests, volcanic geological remains and existing ecological problems, through changes in the relevant data of the ecological system of the landscape area Analyze, determine the source of pollution, and summarize the technical solutions for the planning and control of ecological landscape areas.

(3) *Case study method*. The purpose of this paper to analyze and analyze the ecological landscape area is to better solve the ecological problems in the Wudalianchi Scenic Area. Through the combination of theory and design practice, the actual effect of the results in practice is tested to further improve and enrich the theoretical research.

Table 1: The water intake layout and water intake scale.

Name of water intake	Water intake scale (ten thousand m^3/d)		
	Status quo year	2019 year	2020 year
Town water plant in city A	35	50	50
Town water plant in county B	30	45	45
C water source lake raw water plant	—	351	500
Total	65	446	595

Table 2: The main reference is population, administrative area, proportion of three industries, and regional GDP.

Area	Population (10,000 people)	Administrative area (km^2)	Secondary industry GDP (100 million yuan)
A	139.98	1337.44	834.85
B	151.36	1376.33	1083.43
C	135.55	986.73	1314.7
D	165.70	931.51	1708.83

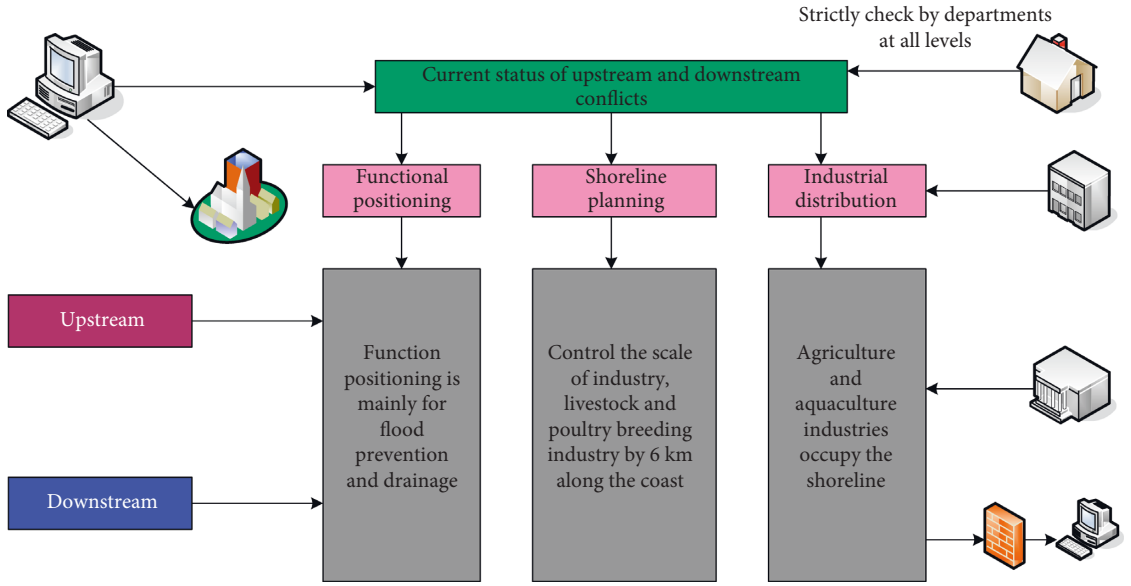

Figure 2: The water environmental protection mechanism.

(4) *Inductive deduction*. In this paper, through the study of the selected ecological landscape area, in order to collect relevant data, provide a reference for the relevant landscape design, and put forward empirical evidence based experience and improvement suggestions for future ecological restoration construction. The water environmental protection mechanism is shown in Figure 2.

In addition, 12 sampling points (W1–W12) in the scenic spot were selected as the measuring area, and the measuring method was determined by isotope tracing analyzer, in which BOD was found by BOD rapid analyzer, and total phosphorus index was measured by total phosphorus analyze.

3.4. Data Sources. The data used in this article comes from the Bureau of Urban Sustainable Development, Institute of Urban Environment, Chinese Academy of Sciences, National Bureau of Statistics, "China Forestry Press," "Science Press," "Southern Agriculture," Journal of Water Resources and Water Engineering and Science and Technology Innovation Guide.

4. Discussion

4.1. Industry Situation. The landscape cities studied in this article include more than 40 industrial enterprises such as mineral water plants, grain processing plants, tourist souvenir companies, mineral bean products plants, and mineral spring cosmetics plants. Tourism, health care, and cultural industries have developed rapidly. The total agricultural output value is shown in Figure 3.

It can be seen from Figure 3 that in recent years, the total number of tourist visits and agricultural output has shown an upward trend. In 2018, the number of tourist visits reached 1.3 million, and in 2018 the total agricultural output value reached 3 billion yuan.

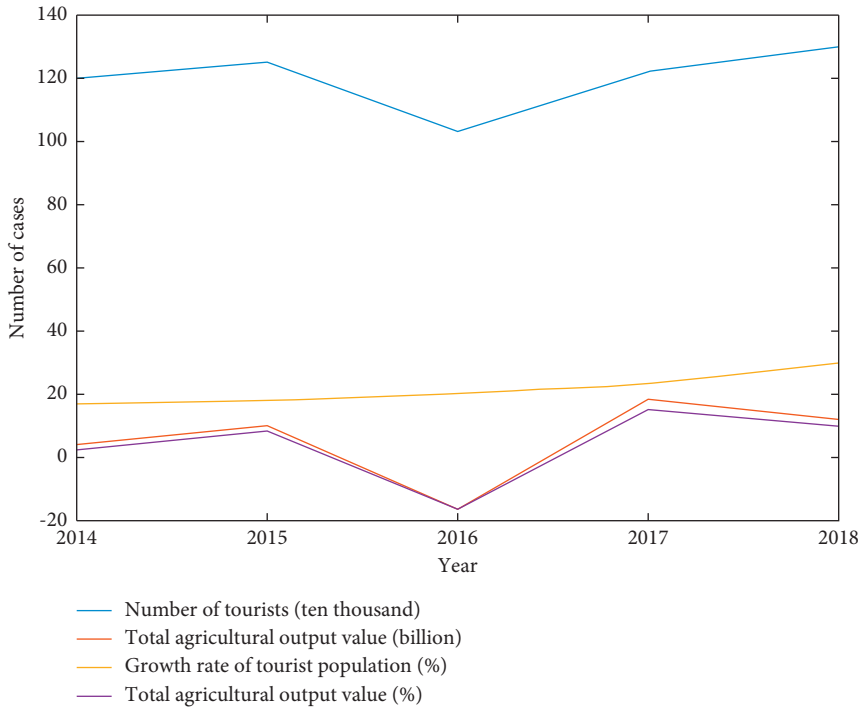

Figure 3: Number of tourists and total agricultural output value.

Table 3: Stratigraphic profile.

Circles	System	Unification	Symbol	Lithology	Age
Freshmen	Quaternary	Holocene	βQ42	Shilong lava	1719–1721 a
			BQ41	Shilong lava	1719–1721 a
		Upper pleistocene	BQ31	Lava	0.17–0.19 Ma
			βQ23	Lava	0.28–0.34 Ma
		Middle pleistocene	BQ22	Lava	0.40–0.57 Ma
			βQ21	Lava	0.70–0.88 Ma
		Lower pleistocene	βQ12	Lava	1.053–1.416 Ma
			βQ11	Lava	2.076 Ma

Table 4: Statistical table of Lake area and water depth.

Lake name	Head pool	Two pools	Three pools	Four pools	Five pools
Area (km^2)	0.59	3.6	11.31	0.47	6.86
Water depth (m)	2–4	4–6	19–36	2–4	4–6

4.2. Geology and Landform. The ecological landscape area studied in this paper is a hilly area with complete volcanic landforms. The highest altitude is 630 m and the lowest altitude is 240 m. The overall terrain of the scenic area is higher in the east, north and west, and the middle and south Lower. The formation development is shown in Table 3.

It can be seen from Table 3 that in the ecological landscape area studied, most of the strata belong to the Cenozoic, the Quaternary, the strata are divided into Holocene, Upper Pleistocene, Middle Pleistocene and Lower Pleistocene, most of the lithology is volcanic lava.

4.3. Hydrology and Water System

(1) The ecological landscape area studied in this article is rich in water resources, and its surface water system has one pool, two pools, three pools, four pools, and five pools; the lake area is relatively developed, with a river width of 3-4 m and an average water depth of 0.2–0.8 m The watershed area is 119 km^2, and the measured flow in the middle reaches is about 1.0 m^3/s during the flood season. The surface water in the scenic area is relatively abundant, with a total reserve of 83 million m^3, the total

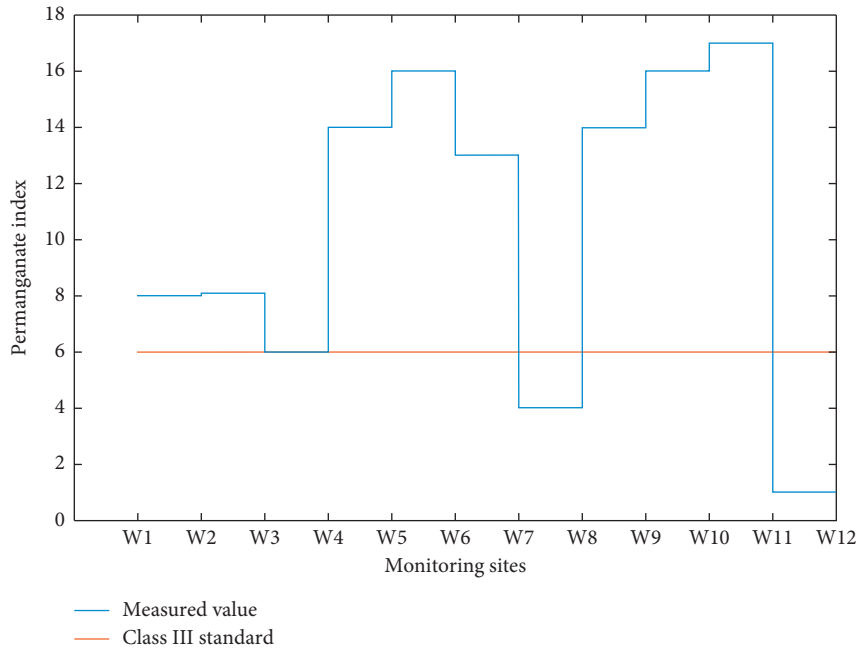

Figure 4: Permanganate index analysis.

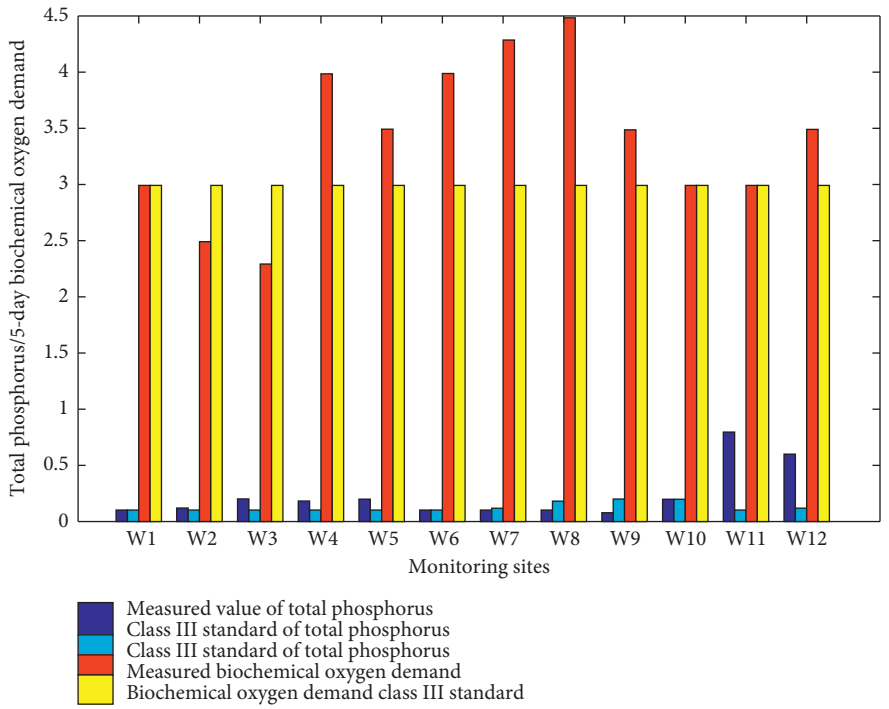

Figure 5: Analysis of total phosphorus index and five-day biochemical oxygen demand index.

runoff of the main rivers is 35 million m^3/year, and the groundwater resources with water supply significance are Quaternary basalt cavern fissure water, and the total natural recharge is 40 million m^2/year The amount of development resources is 19.5 million m^3/year. The water depth of the lake area is shown in Table 4.

It can be seen from Table 4 that the total area of the first pool, the second pool, the third pool, the fourth pool, and the fifth pool is 22.83 km^2, and the flood season is 43 km. Among them, the three pools have the largest area, followed by the five pools, the smallest, and the deepest.

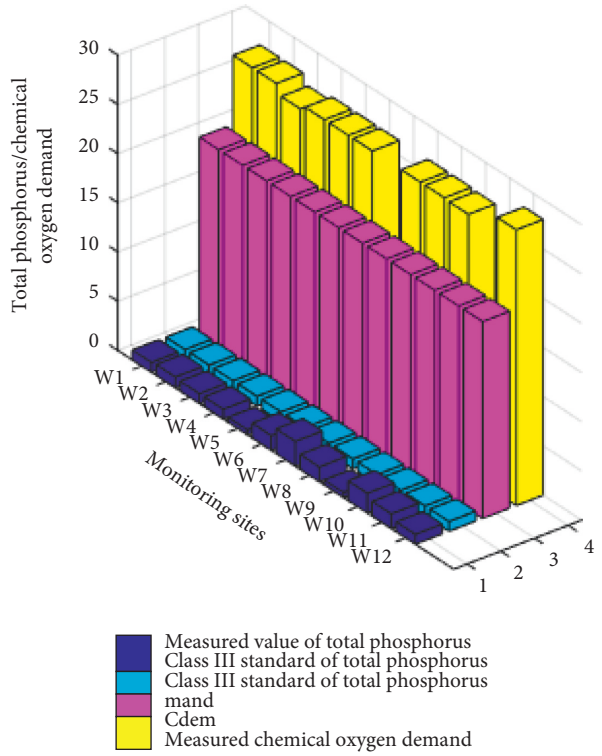

Figure 6: Total phosphorus index and chemical oxygen demand index analysis.

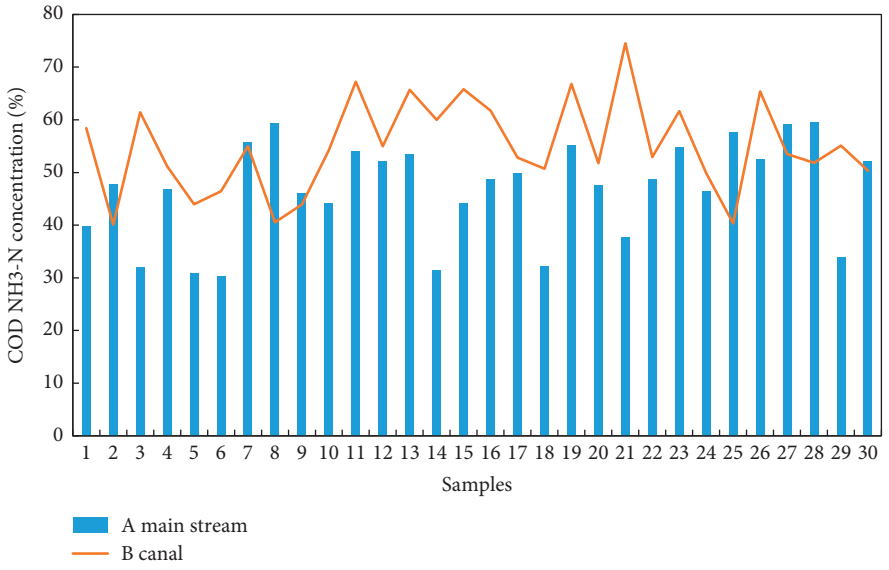

Figure 7: The analysis result of the intersection of A main stream and B canal.

(2) Before the comprehensive ecological environment management is implemented in the scenic area, the analysis is based on the data collected from the 12 sampling points (W1–W12) in the scenic area. The water quality in the landscape area is seriously polluted, which seriously affects the drinking water safety of the residents. Related water quality monitoring activities, the monitoring results are shown in Figures 4–6.

It can be seen from Figures 4–6 that the permanganate index, COD, BOD5, total phosphorus, and total nitrogen in the water surrounding the lake cannot meet the requirements of the category III water environment functional zone, and the permanganate index is the most polluted It is the W10 monitoring point, which is 1.98 times over standard, followed by the W8 monitoring point, which is 1.65 times over standard; the COD pollution is the heaviest at the W7 monitoring point, 0.56 times over standard; the BOD5

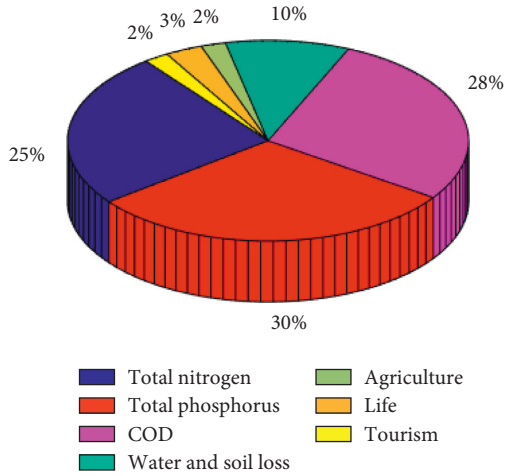

Figure 8: Analysis of the proportion of pollution sources.

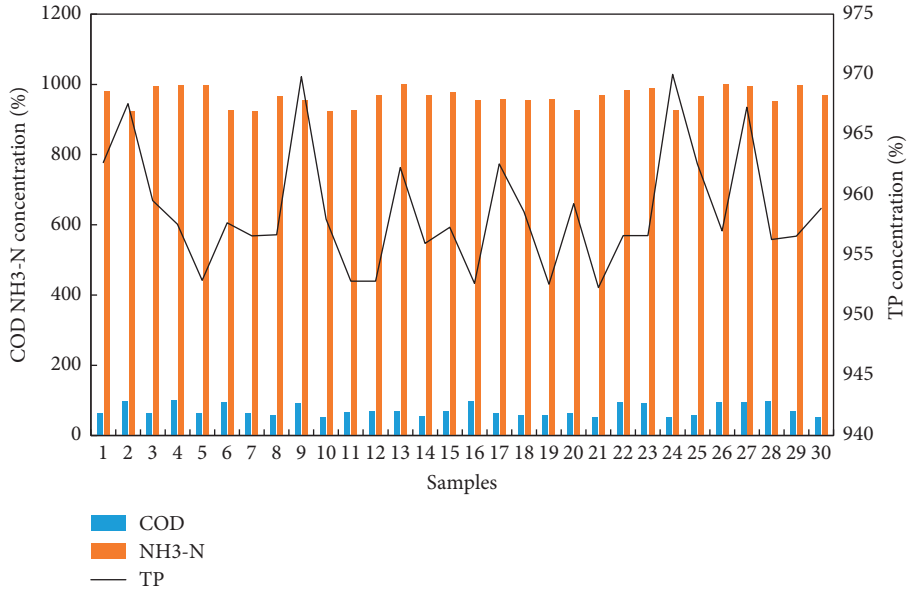

Figure 9: The comparison between the water quality of the surrounding tributaries and the main stream.

pollution is the heaviest at the W8 monitoring point, 0.39 times over standard; The heaviest is the W11 monitoring point, which exceeds the standard by 19.90 times.

The single-factor pollution index method was used for analysis. The water quality during the high water season was mainly affected by agricultural non-point sources and soil erosion pollution. The water quality during the high water season was worse than the average annual water quality. Permanganate index, COD, total phosphorus, BOD5, total nitrogen meet the requirements of Class III water environment functional zone, of which permanganate index and total phosphorus are Class V, COD and BOD5 are Class IV, the upstream pollution mainly comes from agricultural sources Source and make-up water; the midstream water quality is Class V, and the main excess factors are permanganate index, COD, total phosphorus, total nitrogen, and BOD5, which meets the requirements of Class II water environmental function zone, in which total phosphorus is Class V, permanganic The salt index and COD are category IV, and the midstream pollution mainly comes from agricultural non-point sources and tributaries into the lake: the downstream water quality is category IV, and the main excess factors are permanganate index, COD, total phosphorus, total nitrogen and BOD5 meet the water environment of category III The functional zone requires that downstream pollution mainly comes from agricultural non-point sources around the lake. In order to explore the influence of the tributary catchment on the water quality of the main stream, the intersection of the A main stream and the B canal is selected for analysis. The analysis result of the intersection of A main stream and B canal is shown in Figure 7.

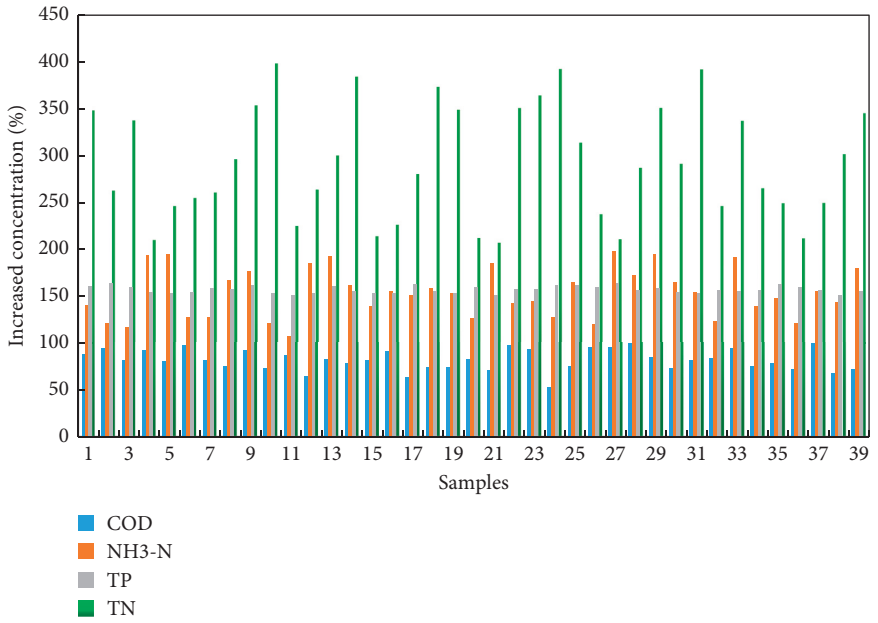

Figure 10: The comparison of the increase in the concentration of water quality indicators under the sluice (DO is the decrease) in each monitoring section.

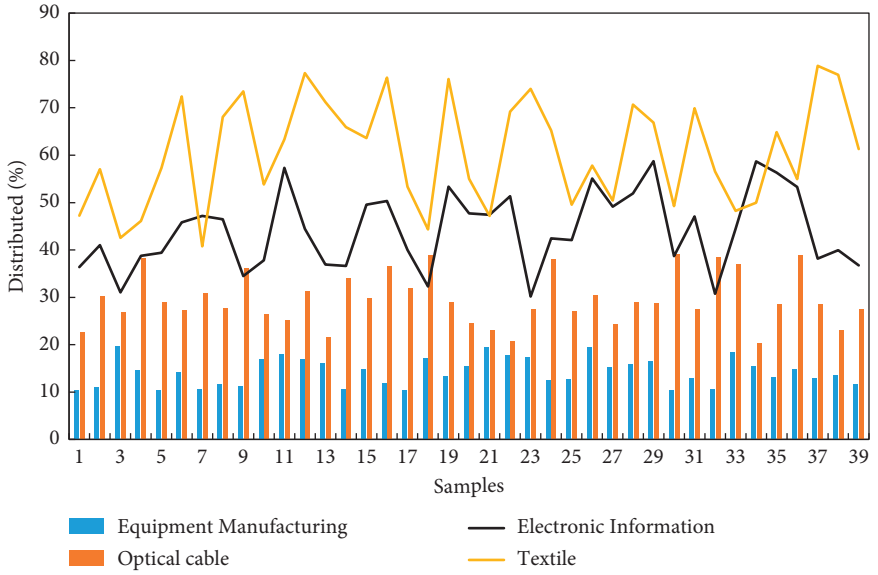

Figure 11: Distribution of the number of industrial leading industrial enterprises above designated size.

Table 5: The nitrogen content of a certain reservoir sediment.

Area	August	September	October
D1	101.5	408.0	418.6
D2	402.8	188.2	267.2
D3	415.7	162.7	202.1
D4	124.1	271.7	482.5
D5	206.2	128.9	170.1

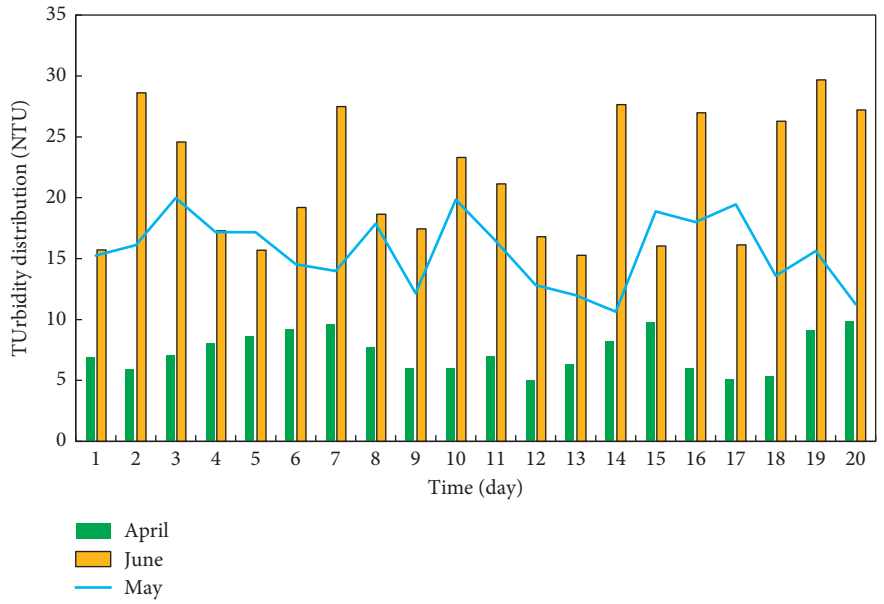

Figure 12: The turbidity distribution of the water area.

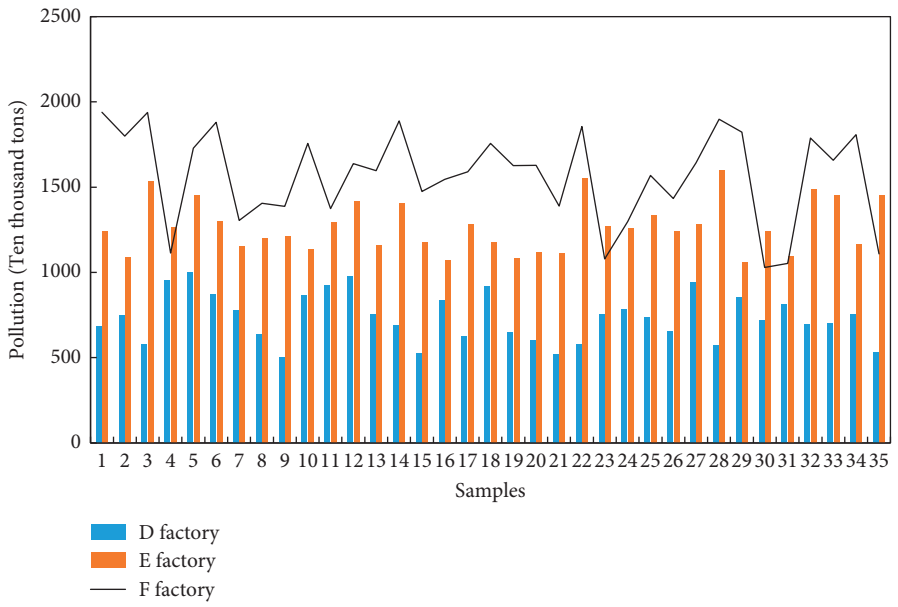

Figure 13: The product discharge of the C town factory.

4.4. Pollution Source of Soil Erosion. There are 1900 hm^2 grassland and 2650 hm^2 woodland around the lake, and 1280 hm^2 land for construction and residential transportation. The amount of soil erosion is calculated according to the following formula:

$$L = \sum_{i-1}^{m} EiAi, \tag{10}$$

L-Total output of certain pollutants in various types of land (*t*), *Ei*-pollutant output coefficient (kg/hm^2·a), Ai-means in the formula that a certain area of land use (h m^2).

4.5. Analysis of Pollutant Production. Through the analysis and research of detection data, the permanganate index, COD, BOD5, total ke can not meet the requirements of the category III water environment functional zone. After analyzing and studying the pollution situation in the scenic area, the source of the pollution was determined, and the main problems of the ecological environment governance in the next step were clarified. The analysis of the amount of pollutants produced in the lake basin is shown in Figure 8.

As can be seen from Figure 8, the sources of COD, total nitrogen and total phosphorus pollution are mainly

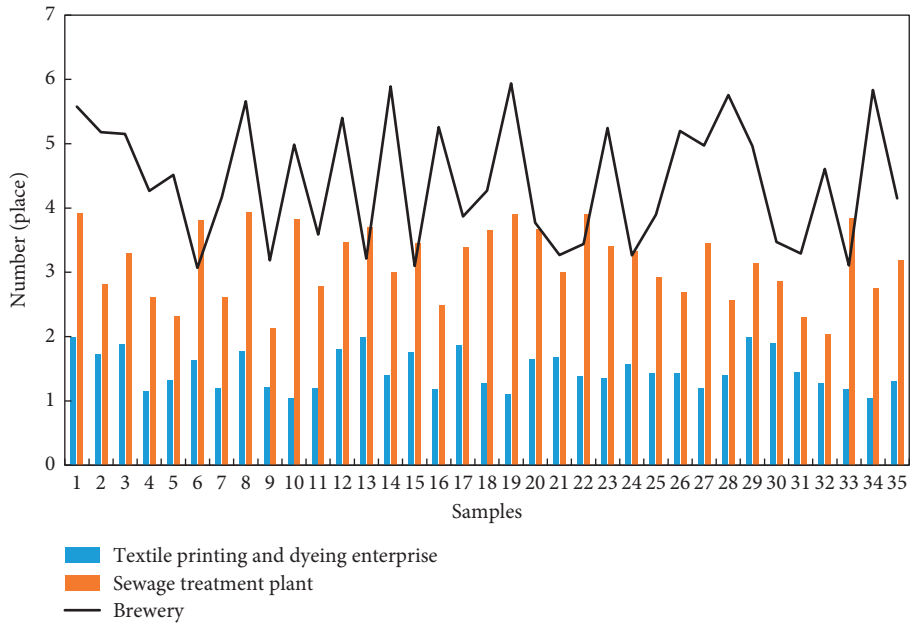

Figure 14: The distribution of the direct discharge outlets.

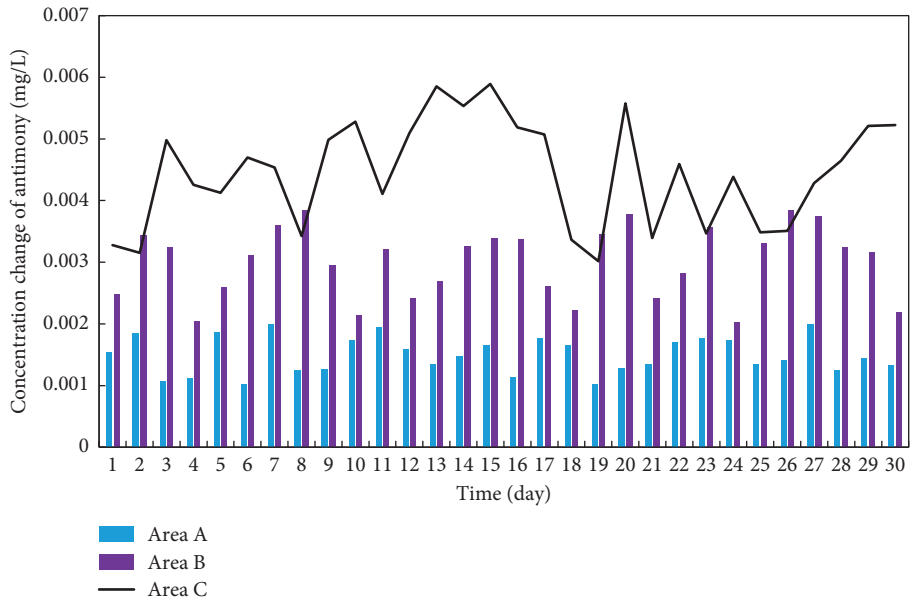

Figure 15: Changes of antimony concentration in the main sections of the main stream of the antimony exceeding event.

agricultural sources and soil erosion in the river basin. The comparison between the city water quality of the surrounding tributaries and the main stream is shown in Figure 9.

The comparison of the increase in the concentration of city water quality indicators under the sluice (DO is the decrease) in each monitoring section is shown in Figure 10. The concentration of TN increased significantly in the section. The various indicators showed steady improvement in the lower reaches of the river.

There are many industrial enterprises in the areas along the route, and a complete industrial chain has been formed, making it difficult to control the source. Figure 11 shows the distribution of the number of industrial leading industrial enterprises above designated size.

The nitrogen content of a certain reservoir sediment is shown in Table 5.

The agglomeration of the textile printing and dyeing industry has also increased the pollution discharge load along the route. According to the statistics of the bureau's pollution survey, the textile printing and dyeing industry above designated size in the upstream area is mainly concentrated in cities and towns. The turbidity distribution of the water area is shown in Figure 12.

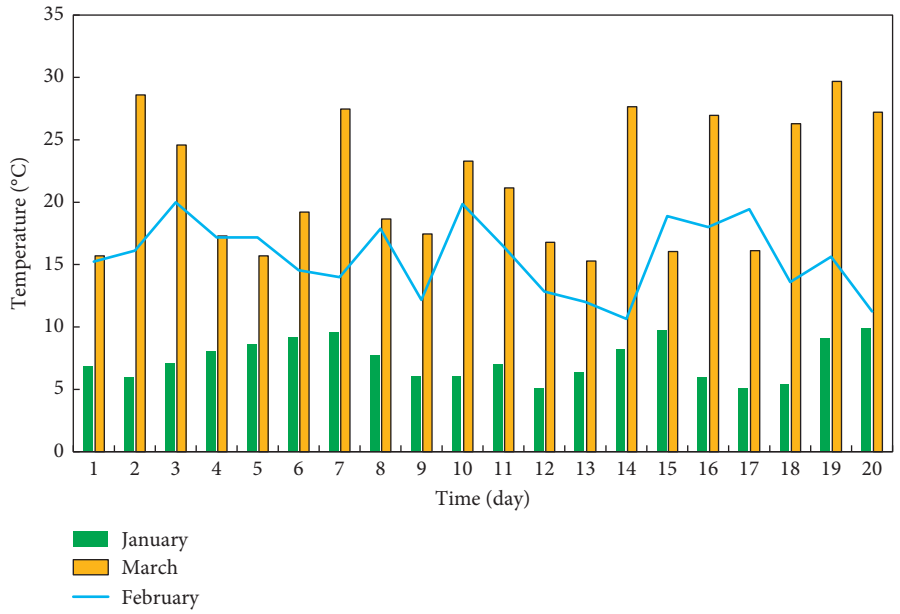

Figure 16: The water temperature distribution in the water area.

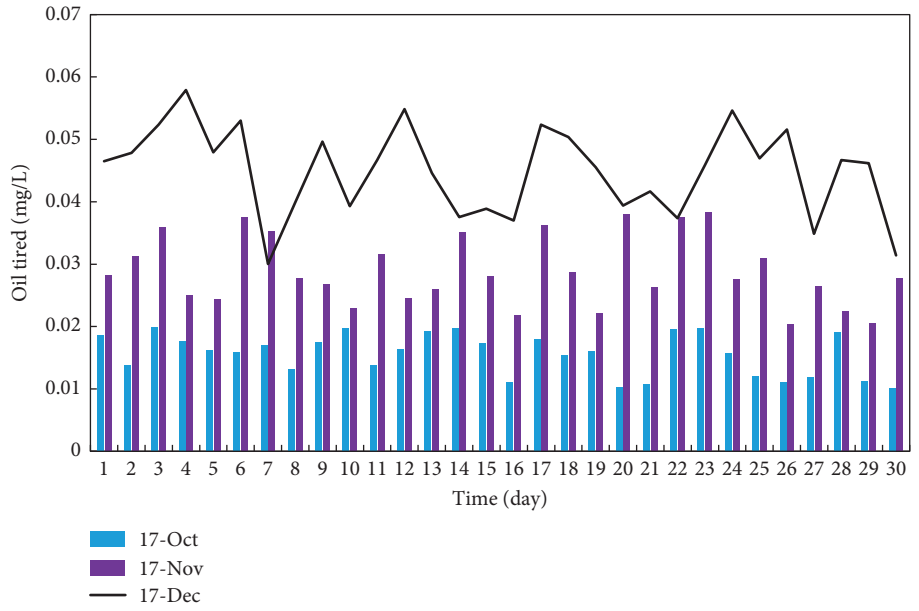

Figure 17: The changes in reservoir oil indicators.

Among them, the wastewater discharge of textile dyeing and finishing enterprises in town C reached 47.206 million tons in 2018. 45.98% of the total wastewater discharge; the chemical oxygen demand discharge is 2789.27 tons, accounting for 44.97% of the total chemical oxygen demand discharge. The product discharge of the C town factory is shown in Figure 13.

The distribution of the direct discharge outlets is shown in Figure 14.

Figure 15 shows the changes of antimony concentration in the main sections of the main stream of the antimony exceeding event.

The development of the upstream shipping industry has also led to the development of the additional shipping industry in the river basin, which has promoted a higher degree of utilization and development of the upstream coastline. In the field investigation, it was found that the types of the main stream shoreline invaded by the shipping auxiliary industry mainly include ship docks, gas stations, maintenance stations and industrial enterprises. The city water temperature distribution in the water area is shown in Figure 16.

The development and utilization of high-strength shoreline will cause potential pollution to the city water

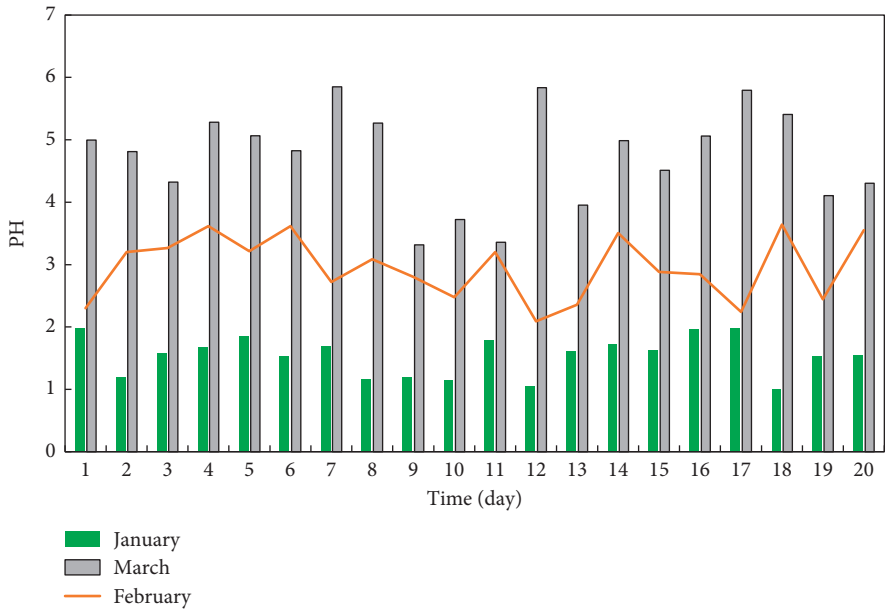

Figure 18: The pH distribution of the reservoir.

environment, thereby increasing the difficulty of environmental protection and treatment of water sources. The changes in reservoir oil indicators are shown in Figure 17.

The pH distribution of the reservoir is shown in Figure 18.

5. Conclusions

With the deepening of China's reform and opening up, agriculture, tourism, and manufacturing have made rapid progress. While improving people's living conditions, ecological and environmental problems have become increasingly prominent, and landscape areas are also facing the same problems. The research in this paper shows that landscape design should follow the principle of coordinated symbiosis between human and land systems, keep the ecological planning and design in harmony with the overall plan's short- and long-term goals, and enhance landscape taste.

The study in this paper shows that the permanganate index, COD, BOD5, total phosphorus, and total nitrogen in the water surrounding the lake can not meet the requirements of the category III water environment functional zone. Among them, the most polluted permanganate index is the W10 monitoring point, which exceeds 1.98 Times, followed by W8 monitoring point, 1.65 times over standard; COD pollution is the heaviest W7 monitoring point, 0.56 times over standard; BOD5 pollution is the heaviest W8 monitoring point, 0.39 times over standard; W11 monitoring point is the heaviest total phosphorus pollution, Exceeding the standard by 19.90 times. The ecological environment is an important guarantee for human survival and development, and supplies humans with food, water and other elements that depend on it. Protective landscape design has important significance for the regional ecological factors and species ecological relations. It should be adopted through reasonable landscape design. Minimize the damage to the original natural environment, protect the good ecosystem, use ecological design methods, reduce human interference, protect the natural ecological environment in the base, coordinate the base ecosystem, and make it more healthy development.

Under the situation of increasing function of city drinking water source, investigating and studying the cooperative protection mechanism of river water is of great significance to the protection of river water environment, as well as to the upstream economic development and downstream water safety. As a typical cross-border river in the river basin, the research on cooperative protection of the water environment of the city river basin has important reference significance for the city water environment management of the river basin. Compensatory landscape ecological design uses scientific methods in the design to explore design techniques and landscape elements that are more suitable for use in landscapes and can reduce the impact on the ecological environment. It is a way to consciously restore the damaged ecological environment. The design process of landscape form to compensate nature. Now, designers have reduced the consumption of renewable energy as much as possible through science and technology, and began to apply a lot of renewable energy in nature, such as solar energy and wind energy, to adapt to the modern ecological environment. The research in this paper shows that the purpose of ecological design is to maintain the balance of the natural ecosystem, maintain the diversity of species, and ensure the sustainable use of resources, but in the final analysis, it is all for the sustainable development of human society. At the same time, the deepening of ecological design theory and the exploration and expansion of design methods will also go further; and in China While gradually entering a conservation-minded society, landscape architects should follow the ecological principles through the

understanding of ecological concepts, so that the human settlement environment gradually becomes ecological and achieves the harmonious development of man and nature.

Data Availability

This article does not cover data research. No data were used to support this study.

Conflicts of Interest

There are no potential competing interests in our paper. And all authors have seen the manuscript and approved to submit to your journal. The authors confirm that the content of the manuscript has not been published or submitted for publication elsewhere.

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