International Journal of Science and Engineering Applications
Volume 12-Issue 05, 78– 80, 2023, ISSN:- 2319 - 7560
DOI: 10.7753/IJSEA1205.1023

Research on Comprehensive Treatment of Urban Wetland Water Pollution Based on Ecological Water Technology

Dong Yunqin*
Zaozhuang College
Zaozhuang Shandong
277100, Shandong, China

Guo Tao
Xuecheng District Environmental Monitoring Station
Zaozhuang, China

Abstract: In view of the traditional urban development and planning thinking that emphasizes infrastructure construction while ignoring the construction of urban ecosystems, starting from the planning of urban rivers and lakes, the concept of urban wetlands is extended from the basic concept and development of wetlands, and the basic concepts of urban wetlands are analyzed. The current situation, analyzing the water system structure degradation, serious water pollution, channelization of water system, reduced sensitivity of water cycle, artificial revetment, and reduction of biodiversity in urban wetlands, such as water system, water quality, and water ecology. Pollution control issues and the comprehensive improvement of water environment will be focused on, and corresponding strategies will be proposed for reference.

Keywords: Comprehensive Treatment, Wetland Water Pollution, Ecological Water Technology

1. INTRODUCTION

In recent years, the construction of water ecological civilization has become an important link in environmental protection and restoration, and it is also a key node in retaining "green water and green mountains". Water is the blood of the ecological environment, and water resources are the basic resources for human survival. Water ecology directly determines whether the ecosystem is healthy or not. As one of the three major ecosystems of the earth, the wetland is known as the "kidney of the earth", and it is also an important place for the existence of water resources, and it is the subject of evaluating whether the water ecology is good or not. Wetlands have many characteristics, including obvious biodiversity, strong environmental sensitivity, poor self-recovery ability, and special ecological balance functions. It is precisely because of these characteristics that the protection, restoration, and construction of wetlands are very difficult.

In the process of industrial production, fuel combustion will produce a large amount of industrial waste gas, and these waste gases contain certain harmful substances, such as carbon dioxide, mercury, and lead, etc., which will seriously affect the quality of urban life. To obtain higher economic benefits and reduce cost investment in their own development, some industrial enterprises do not treat industrial wastewater according to regulations, but directly discharge it into the urban water system, which seriously affects the urban environment.

In addition, industrial enterprises will carry industrial waste in the process of wastewater discharge, specifically fuel residues, industrial waste and dust generated during production, which will have a great impact on the urban water environment. In short, industrial waste gas, industrial waste and industrial wastewater will all affect the quality of urban water environment, and relevant departments must attach great importance to this. Through relevant literature and field research data, combined with national water pollution control investment statistics and expert scoring, six indicators that are closely related to the national water pollution control investment efficiency are finally determined.

The input indicators mainly include annual operating costs (X1), investment in water pollution control infrastructure (X2), and investment in smart technology (X3); the output indicators include economic benefits (Y1), social benefits (Y2), and environmental benefits (Y3). aspects are calculated. The narrow concept of wetland refers to the transition area between terrestrial system and aquatic system, which has obvious characteristics of biodiversity. The broad concept includes swamps, tidal flats, forest peatlands, muddy reefs, shallow waters, rivers, lakes, and other forms. Wetlands can regulate climate, regulate floods, conserve water sources, purify water quality, protect biodiversity, and provide a good living environment for humans. For cities, especially large and medium-sized cities with relatively large impermeable areas and relatively concentrated population distribution, wetlands mainly exist in the form of rivers, lakes, and artificial wetlands (commonly known as wetland parks).

2. THE PROPOSED METHODOLOGY

2.1 The relationship between ecological water technology and wetland water pollution

Scientifically formulate a comprehensive urban water environment improvement plan, incorporate modern development concepts, and conduct in-depth research and analysis on the development of the ecological environment. During the period, water landscape, water ecology and water pollution need to be effectively treated in strict accordance with the requirements, to ensure the value and significance of urban water environment governance. During the period of comprehensive management of water environment, relevant departments need to focus on planning for greening control and river course control, to lay a good foundation for realizing a virtuous cycle of water environment. The development of urban wetlands is closely related to the development of the city. Taking Beijing as an example, from the capital of Yan in

the Western Zhou Dynasty to Nanjing in the Liao Dynasty and then to the capital of the Yuan Dynasty, Beijing has a history of more than 3,000 years. Since ancient times, rivers, lakes, and swamps have been everywhere, and successive rulers have opened canals. Water was diverted for irrigation, and there were records of thousands of hectares of rice fields in Youzhou in the Tang Dynasty.

There are now five major water systems in Beijing: Yongding River, Chaobai River, Beiyun River, Juma River, and Gouhe River. There are more than a hundred large and small rivers, but many small and medium-sized rivers are dry all year round. According to statistics from the Beijing Landscaping Bureau in 2008, the wetland area in Beijing is 51,400 hectares, less than 3.5% of the country's land area. The rapid development of the city has led to rapid changes in the underlying surface of the city, and the impervious rate has increased year by year. The rivers in the city have been narrowed to reduce the land use, the confluence time of the watershed has been shortened, the flood volume has been concentrated, the peak value has become larger, and the rivers carry more flood discharge. The function of releasing water, ignoring the connotation of water ecology, the original natural wetland system was transformed into a constructed wetland system.

To further promote the current capital investment in urban water pollution control and water environment integration, and better ensure that related work is carried out in an orderly manner, the relevant departments need to do the following: First, increase financial support, according to the actual situation The overall situation of comprehensive management of water environment, reasonable standardization of governance objectives. At the same time, relevant personnel should also include sewage treatment work in annual financial management according to work requirements such as comprehensive treatment, to provide financial support for urban water environment treatment work; second, actively organize multi-channel fundraising, Build an investment management system with diversified characteristics in combination with the actual situation. Most provinces and autonomous regions in my country are already implementing the construction and development of smart cities. Smart technology has been applied to all walks of life. Under the background of smart water control, smart technology investment is introduced into the water pollution control model to construct the investment efficiency evaluation of water pollution control. Indicator system framework.

The data mainly come from China and local statistical yearbooks, environmental statistical yearbooks, and environmental yearbooks of 30 provinces (autonomous regions and municipalities directly under the central government) in China. To ensure the scientific and validity of the data, the above six input and output indicators were obtained by using SPSS software The correlation coefficient between the old urban areas. The confluence of rain and sewage in the old urban areas, the leakage of rainwater and sewage pipes, and the chaotic connection often cause sewage to directly enter the urban water system. If the garbage disposal in the suburban areas is not timely, it will also pollute the urban wetlands. After rain and sewage diversion, there is still the problem of primary rain pollution.

2.2 Water Pollution Control Approach of Urban Wetland Based on Ecological Water Relationship

Taking the northern cities as a typical case, urban water pollution is also closely related to the scarcity of water resources. The scarcity of water resources leads to small water volumes in rivers and lakes, and the insufficient capacity of 7jC bodies to hold pollutants. In addition to natural rivers in northern cities, the water source of the landscape water system is mainly reclaimed water. Reclaimed water that meets the landscape water standard has water quality indicators such as ammonia nitrogen and total phosphorus that are inferior to or close to the fourth-class water. In the absence of water purification and treatment Under the environment, the reclaimed water used for landscape is very prone to algal blooms. Insufficient legislation and supervision on water pollution prevention and control are also important reasons for water quality and water ecological problems in urban wetlands. In the process of urban pollution control, it is necessary to attach great importance to the comprehensive treatment of urban water environment, properly adjust and optimize the work in strict accordance with the standards and requirements and do a good job in the coordination of the treatment work.

In addition, relevant departments and personnel need to improve and adjust the existing urban water environment planning strategies in a targeted manner, and strengthen coordination and cooperation among various departments, to reduce the occurrence rate of water environment problems to the greatest extent. The higher the investment in water pollution control infrastructure, it will affect its output indicators to a certain extent. Due to the low efficiency of the use of water pollution control infrastructure, it is impossible to obtain explicit benefits from increasing the investment, thus Reduced correlation between input and output indicators. The analysis of statistical results shows that there is a correlation between the input and output indicators of investment in water pollution control, and it is meaningful to evaluate the input-output efficiency of water pollution control. The artificial separation of the aquatic system and the terrestrial system greatly destroys the structure and function of the wetland, breaks the cycle of matter and energy, and further destroys the habitat of microorganisms, animals, and plants.

On the one hand, the hard revetment weakens the circulation exchange between surface water and groundwater, on the other hand, it also aggravates the occurrence of water pollution such as algal blooms, which is not conducive to the construction or restoration of natural water ecosystems. For the control of urban sewage, to effectively ensure the effect of comprehensive treatment of urban water environment, relevant departments must strengthen the supervision of the work. Auditing, market supervision, bidding and other participation are required in urban construction, mainly to provide support for urban water resource improvement and to meet the needs of current social and economic development. The government, enterprises, and the public are actively participating in the comprehensive evaluation of the comparative impact of modern smart technology investment and traditional non-smart technology investment on water pollution control investment efficiency from three aspects: economic benefit, environmental benefit, and social benefit, which is more in line with the current situation. The sustainable development of water environment governance under the background of stage intelligence, in which traditional non-intelligence technology input mainly refers to

the comprehensive efficiency of water management calculated by using traditional non-data sharing information technology and excluding the smart technology input indicators.

Using DEAP2.1 software in the model, the comprehensive efficiency, pure technical efficiency, and scale efficiency of investment in water pollution control can be obtained. Urban wetland planning should adhere to the multi-dimensional planning thinking. In addition to block planning, the city-wide and regional planning should be carried out with the water system as the research object, and the natural water system should be avoided as far as possible. Environmental carrying capacity planning, water system ecological restoration planning, resource recycling planning, etc., and realize the connectivity of the same water system in different plots, realize the linkage between regions through the water system, flexibly regulate and store floods, and enhance the functionality and landscape of urban wetlands sex.

3. CONCLUSION

This paper analyzes the basic status quo of urban wetlands and the existing ecological problems, and puts forward the planning objectives, planning principles and planning strategies to solve the problems from the planning level. This paper takes urban wetlands as the research object, analyzes six aspects of water system structure, water pollution, water channelization, 7K cycle sensitivity reduction, revetment artificialization, and biodiversity reduction, and puts forward a proposal to optimize the urban water system. structure, determine the management mechanism for the comprehensive improvement of the urban water environment, actively implement the responsibility system for water pollution management, and increase capital investment in urban water pollution control and comprehensive improvement of the water environment. Social and economic needs for environmental development.

4. REFERENCES

[1] Zhao Xingyun, Wang Xiaolei, ZHAOXing-Yun, et al. Research progress on the purification mechanism of urban wetland aquatic plants in water pollution control [J]. Wetland Science and Management, 2009(2).

[2] Huang Weilai, Li Ruixia, Yang Zaifu, et al. Research on Comprehensive Treatment of Urban River Water Pollution[J]. Environmental Science and Technology, 2006, 29(10):109-111.

[3] Xiang Jianjun. Research on comprehensive treatment technology of urban inland river water pollution [J]. Chinese Science and Technology Journal Database (Citation Edition) Engineering Technology, 2021(6):3.

[4] He Xiaoke, Qiao Peng, Zhao Longgao. Research on the model of comprehensive treatment of urban sewage by constructed wetlands in coastal areas——Taking the comprehensive treatment of mountain, sea and sky sewage and the restoration of constructed wetlands in Rizhao City as an example [C]// Agricultural Water and Soil Engineering of the Chinese Society of Agricultural Engineering the Fifth National Academic Conference of the Professional Committee. 0.

[5] Mao Xianzhong, Gui An, Tao Yi, et al. Research on combined process effect of water environment restoration in urban lakes——Taking Shenzhen Litchi Lake Treatment Project as an example [J]. Lake Science, 2008(04):56-62.

[6] Mao Xianzhong, Gui An, Tao Yi, et al. Research on combined process effects of water environment restoration in urban lakes——Taking Shenzhen Litchi Lake Treatment Project as an example [J]. Lake Science, 20(4).

[7] Deng Huijuan. Exploration on the reuse of rainwater resources in Yan'an landscape design [D]. Shaanxi Normal University, 2019.

[8] Pu Xitong, Li Tingting, Huo Yipeng, et al. Urban Wetland Ecological Problems and Countermeasures Based on Planning Level [C]// 2019 China Urban Planning Annual Conference. 0.

[9] Bi Yonggang, Zhang Tong, Liao Rihong, et al. Research and technology demonstration of sewage treatment planning, technology, and management guarantee system in rural areas of Beijing [J]. Chinese Academy of Sciences Key Laboratory of Environmental Biotechnology: Preparation, 2011.

[10] Sewage Treatment. Application of Constructed Wetland in Urban Water Pollution Control (Qin Ming)[J]. Water Information Network.

[11] Yang Hongtao, Xue Min, Xie Zheng, et al. Research Progress of Constructed Wetland Sewage Treatment Technology and Its Application in Northern my country [C]// National Science and Technology Major Project "Water Pollution Control and Treatment" River Theme" River Basin Industry Point source water pollution control technology" seminar. 2009.

[12] Anonymous. Research on the model of comprehensive treatment of urban sewage by constructed wetlands in Binhai District——Taking the comprehensive treatment of mountain, sea and sky sewage and the restoration of constructed wetlands in Rizhao City as an example [C]//The Fifth Session of the Agricultural Water and Soil Engineering Professional Committee of the Chinese Society of Agricultural Engineering National Academic Conference. ; Chinese Society of Agricultural Engineering; 2008.

[13] Jia Lingyu. Research on Urban Water Pollution Control and Water Environment Comprehensive Improvement Strategies [J]. Northern Environment, 2019, 031(004):59,61.

[14] Liao Yinfeng. Research on Comprehensive Treatment of Urban River Water Pollution[J]. Resource Conservation and Environmental Protection, 2015(7):1.

[15] Long Tengrui, Zhai Jun, He Qiang. Research on Comprehensive Control Planning of Water Pollution in the Tiaodeng River Basin of Chongqing [C]// National Water Supply and Drainage Technology Information Network Annual Conference. National Water Supply and Drainage Technology Information Network, 2006.