

Analysis of the Management of Small and Medium Rivers in Urban Area Based on Ecological Civilization Construction of Waters

Tongyue Feng¹, Qing He², Huan Mei³

¹Department of International Business, Anhui University of Finance and Economics, Bengbu, Anhui Province, 233030, China

²Department of Accounting, Anhui University of Finance and Economics, Bengbu, Anhui Province, 233030, China

³Department of Finance, Anhui University of Finance and Economics, Bengbu, Anhui Province, 233030, China

Abstract: Water is the soul of the city, people in the early construction of the city is based on water, all the major cities today are river through. Rivers are closely related to the development of towns. As one of the indispensable and important substances for the survival and development of human beings, the study of water resources plays a great role in the construction of ecological civilization in cities. However, the problem of sewage discharge is still prevalent in small and medium-sized cities. Even though the country has spent a lot of money in recent years to deal with water pollution and implement measures to treat rivers whose ecological environment has been destroyed, the problem of sewage discharge cannot be solved fundamentally. Based on the research on moon lake in Chizhou, Anhui province, this paper holds that the restoration of urban small and medium-sized rivers should be based on the restoration of high-quality water resources, put forward the strategy of systematic management, ecological priority, improve the comprehensive benefits of urban small and medium-sized rivers, give full play to the role of effective supervision by residents, and build a new ecological civilization in the water areas. Based on the shortcomings and experience gained from the treatment of moon-lake sewage in Chizhou city, we will popularize the treatment of urban river wastewater from small to large, take the improvement of water environment as an important part of ecological management, find out the problems in the process of water environmental management and put forward corresponding measures to establish scientific and efficient protection mechanism.

Keywords: Moon Lake, Chizhou, Anhui Province; Urban waters; Small and medium river management; Water environment; Water pollution management.

1. Introduction

After the country realized the damage of ecological resources due to the focus on rapid economic development, it began to pay attention to ecological management. Ecological protection is becoming the main theme of the times. In order to improve the ecological environment, the State has promulgated the Regulations on the Permit of Sewage Disposal, which control the discharge of pollutants and improve the water environment. After the corresponding national policies were issued, governments at all levels took the fight against water pollution as a priority, implemented corresponding policies from the grass-roots level, optimized prevention and control measures, took improving the water environment as an important part of ecological governance, identified problems in the process of water environmental governance and put forward corresponding measures to establish scientific and efficient protection mechanisms.

2. Water Construction Based on the Concept of Urban Ecological Civilization

Since the Eighteenth National Congress was convened to promote the "five bodies, one person" layout, the construction of ecological civilization has been included in the realization of an important link in the great rejuvenation of the Chinese nation, closely related to the development of the country and the rejuvenation of the nation. With the development of our country's society and economy, the drawbacks of focusing on

rapid economic development are becoming more and more obvious, and the importance of urban ecological civilization is becoming more and more obvious. As one of the indispensable and important substances for the survival and development of human beings, the study of water resources plays an important role in the construction of urban ecological civilization. The construction of water ecological civilization is to prevent water pollution under the premise of protecting water resources, preventing water ecological problems and putting forward better ecological solutions from the perspective of harmonious ecology [1]. According to the 2017 State of the Ecological Environment Bulletin of China, the situation is not good when it comes to the monitoring of water quality points by the Ministry of Land and Resources. The proportion of poor quality monitoring points reached 51.8 percent, while the proportion of good quality monitoring points was only 8.8 percent. [2] Heavy metal levels at individual monitoring sites exceed prescribed emission standards. Water problems not only affect the lives of urban residents, but also hinder the construction of water ecological civilization in cities. It can be seen that water ecological construction still needs our unremitting efforts. River water issues are related to the development of the city, and the water ecological construction is the most important.

3. Reflections on Water Ecological Governance

3.1. Scientific Restoration and Protection of River Biodiversity

3.1.1. River Structural Rehabilitation

The river course is the carrier of water resources. The river management should start with the restoration of river structure, reduce the artificial alteration of river line, preserve the natural features, follow the law of natural structure, repair the previous man-made structural damage, make the river structure more reasonable and retain its original form. This not only plays the role of flood control of the river, but also reflects the diversity of the river.

3.1.2. River Bed Sectional Restoration

In current riverbed operations, most of them are reinforced with concrete. The restoration of riverbed cross-section requires first of all changing the concrete structure of the riverbank, increasing the permeability of the riverbed, replacing concrete with green moat, and exerting the power of natural structures, not only improving the stability of river ecology, but also completing the ecological embankment, providing a good habitat for aquatic life and enhancing visual perception.

3.1.3. River Ecological Restoration

Due to the impact of species invasion and irrational release, the ecological balance of a large number of rivers has been disrupted, leading to the extinction of many aquatic organisms, making the ecological environment of rivers in a vicious cycle. The ecological restoration of rivers is to maintain the biodiversity of flora, fauna and microorganisms through scientific research and artificial release to repair the broken biological chain, so that the biological structure is more stable and the ecological environment reaches a dynamic balance.

3.2. Systematic Governance with Ecological Priority to Enhance the Integrated Benefits of Urban Small and Medium-Sized River Governance

To sever pollution completely, it is necessary to start from the source, let the surface and the ground combine, deep investigation of the source of pollution; With regard to river problems, scientific analysis must be carried out using modern techniques and systematic management methods to ensure that their management is effective, not repetitive and achieves the goal of treating the root causes. First of all, we should carry out the construction of sewage network and probe the source of pollution. Secondly, it is necessary to carry out the construction project of sewage treatment plant and scientifically treat the detected sewage and chemical enterprises' discharge. Finally, ecological restoration works should be carried out to systematically repair the damaged river ecological environment and improve the efficiency of management.

3.3. Wetland Restoration for Self-Cycling Ecosystems

The restoration of ecological wetland is beneficial to the construction of underwater ecosystem. The lake meets the wetland, establishes the natural transition between water and shore, forms the natural beach, provides the birds, the

amphibians inhabit, crawls. The wetland plant may help degrade the pollutants and improve the water quality. The construction of wetland ecology is conducive to the formation of biodiversity and the realization of ecosystem self-circulation.

3.4. Effective Supervision and Establishment of Ecological Civilization and New Fashion in Water Areas

Water management is a complex and complex system project, with a wide range of coverage and many complex situations. It requires all parties to work together to build a comprehensive service system in conjunction with strict management. Establish a layered supervision pattern with clear responsibilities, form a supervision cooperation force and implement effective supervision and scientific supervision. In order to realize the integration and development of water ecological civilization and water culture, we should combine the protection of the water environment with traditional culture, draw wisdom from traditional culture, adhere to the concept of harmonious coexistence, let culture nurture a sense of regurgitation, create a realm where people live in harmony with nature, carry forward water conservancy spirit, inherit water culture, popularize water conservancy knowledge and build bridges to construct water ecological civilization.

4. Practice of Management and Restoration: A Case Study of Water Management in Chizhou City, Anhui Province

4.1. Overview of the Waters of Chizhou, Anhui Province

Surrounded by water and bordered by the yangtze river to the north, Chizhou is rich in water resources, most notably moon lake, Tinggian lake and south lake. The main lake, Tinggian lake, has an area of 75km² and is the largest lake in Chizhou city. Historically, the waters of Chizhou city are connected with each other, and the government of Chizhou city attaches great importance to water conservancy construction. Because of the economic development of Chizhou city, industrial enterprises keep moving into the city and the population increases, which brings industrial and domestic sewage into the lake. The polluted water is not immune to Moon Lake. In 2019, Moon Lake was discharged into 50 tons of domestic sewage with ammonia nitrogen content of 29.9 mg / l, exceeding the state's prescribed discharge standards.

4.2. Ecological Environment of Chizhou Waters and Its Manifestations

In recent years, occasional problems appear in the water bodies in Chizhou, and the general trend is normal. Before 2016, industrial effluents accounted for about 15 million tons, or about 3 percent of industrial effluents in Anhui province, according to China's statistical yearbook. Since 2016, the proportion has decreased slightly. Industrial and domestic effluents are the main sources of pollution in urban waters. By analyzing the water system and the current ecological system in Chizhou, the following problems deserve attention.

4.2.1. Lack of Protection of Water Bodies

A total of 29 state-controlled sectional monitoring sites in Chizhou in 2022 showed a total of 29 with I-III water quality. The overall water quality was normal, unchanged from the previous month, the data showed. But there are water quality issues, too. In 2019, an extremely classic water pollution incident occurred at Moon Lake in Chizhou City. Officials discovered that the water in Moon Lake, half a lake away in Hunan province, smelled foul. The water quality in Moon Lake was heavily polluted, affecting the lives of nearby residents and causing ecological damage. Officials determined that Moon Lake was connected to an illegal sewage outlet, causing serious water pollution. The case was settled through a consultative process, compensation was awarded for ecological damage, and the degraded water of Moon Lake was eventually silted through ectopic treatment and replacement of water to restore normalcy. Due to the early detection of water pollution from the source and the protection of water bodies, it is necessary to spend a lot of time, manpower and material resources to deal with this water pollution. In the system of urban water ecological civilization, the water prevention and control measures in Chizhou city still need to be perfected.

4.2.2. Difficulties in Flood Management

Tinggian lake, a famous water body in Chizhou city, is one of the main lakes for flood control and storage. However, in recent years, the water quality of Tinggian lake is polluted and the ecological cycle of the waterbody is broken due to the passive reception of pollution from surrounding residents, schools and enterprises at the outlet of the lake. In the course of urban development, the pattern of water interconnection in Chizhou city was broken, and the water bodies were relatively independent. Therefore, whenever the flood season exceeded the standard, the water level of tianyu lake could not meet the demand for water storage, which led to flood prevention difficulties and could not meet the city's development needs.

4.2.3. Inadequate Engineering Measures

The water quality of the water system in Chizhou city is not good because of the disconnection between the water bodies in Chizhou city and the weakening of the self-purification capacity of the water bodies due to the discharge of sewage into the water bodies. Some of the water bodies are adjacent to residential areas and have been converted into fish ponds and ponds, breaking the balance of the natural ecological cycle of the water bodies. On the other hand, Chizhou city is surrounded by water and has unique water natural scenery, but Chizhou city does not pay attention to the integration of water resources, the unique charm of water scenery has not been fully excavated, can not drive the development of urban water ecology.

4.3. Fixing Goals

4.3.1. Water Quality Improvement to Build Water Ecological Health Foundation

Hydrological characteristics, water quality, structure and function of water ecosystem are the main evaluation factors of water ecological health, of which the higher quality is water quality. It can be seen that high-quality water is an important foundation for the construction of water ecological health. Therefore, improving water quality is the primary objective of this restoration.

4.3.2. System set-up to connect water bodies for Internet + control

Each water body is not connected with each other, independent of each other, the water level of the low water level in flood season can not meet the demand for storage, flood prevention difficulties, and the establishment of an Internet water body system, Internet + express, the realization of collective water body control, to facilitate water storage and dispatch between the water bodies, which is also the second goal of this restoration.

4.3.3. Landscape Shaping, Integrated into The Urban Landscape System

Construction of riverfront landscape can not only give full play to the ornamental, experiential, humanistic and ecological nature of the river course, but also make the water conservancy landscape and the whole urban landscape system merge perfectly and become an inseparable and important part of it. And the water conservancy landscape can also be a place for residents to interact and enjoy water, which not only satisfies the needs of citizens for viewing and experiencing, but also becomes a business card to display the history and features of the city, so that the level of human needs can be raised, the quality of life can be improved, is an important way to improve the value of urban taste, and is the focus of the management of small and medium-sized rivers. So make it the third goal of this restoration.

4.3.4. Cultural Absorption and Spiritual Education

The essence of water culture is that in water activities, the good traditions and virtues of the people of a country or region can be demonstrated, creating a realm where people are at the center and people live in harmony with nature. How to repair the current negative water ecological civilization spirit, improve the quality of water conservancy, and attract the public to build water homes is now an urgent question to think about, is also the fourth goal of this restoration.

4.4. Fixing Strategies

4.4.1. Two-source Governance to Improve Water Quality

4.4.1.1 External control

External control is to prevent and control pollution from the source. If we want to completely sever pollution, we need to start from the source, let the surface and underground combination, deep investigation of pollution sources. Most of the surface pollution sources belong to the direct discharge, so we should pay close attention to the discharge of waste from farms, slaughterhouses and industrial enterprises. But underground pollution source is mostly the pipe network problem. should arrange periodically the professional personnel to use the equipment to drain and replace the broken, the blockage and so on the pipes, to ensure that the sewage does not leak. Both the case of moon lake in Chizhou and the case of pH of solid waste piled in the yangtze river were caused by enterprises that did not discharge and discard according to regulations. Only strict control of foreign sources, improved monitoring of Chizhou waters and legal and regulatory support can effectively prevent such cases from recurring.

4.4.1.2 Endogenous governance

Endogenous management focuses on pollution that rivers themselves produce and cannot displace. Due to industrial development and the popularization of chemical products, river hydrodynamics is not enough to decompose the chemical substances in the water body, eutrophic the water body and produce blooms, which leads to serious water

quality decline. Endogenous governance requires, first and foremost, the introduction of the concept of biodiversity and the maintenance of ecological balance. Endogenous management is the use of ecological management technology, through manual cleaning and release, so that the mix of flora, fauna and microorganisms is more reasonable, so that the biological structure of the river is more stable, so that the ecological environment reaches a dynamic balance; Artificial techniques are also used to repair damaged sections and channels, which is more conducive to the development of natural structural forces.

4.4.2. Build A System and Transform Points Into Surfaces

Chizhou is rich in surface water resources. It has three major river systems, 10 rivers and 348.4 square kilometers of river and lake surface. However, each body of water is independent of the other, scattered and not connected to the other. Set up water connection system, thread, all water points in the water surface, Internet system control.

4.4.3. Built Landscape, Reasonable Protection

Rational use is the best protection. Creating a water conservancy landscape with a human touch is the best use of it. Moon lake is located in the main city of Chizhou. It is known as a natural wetland park. It is surrounded by community schools and has a large number of people. Residents demand more and more green environment and culture. Turning moon lake into a parental park can not only protect the ecological environment, but also meet the spiritual and cultural needs of residents. In the construction of Moon Lake and surrounding facilities add Nuo Mask, Nuo drama and other unique cultural elements of Chizhou. The combination of opera culture and architectural design, with architectural design as the carrier, enables its excellent traditional culture to be nurtured.

4.4.4. Building Culture and Passing On The Spirit

Water culture is an important component of Chinese culture and a vital part of water conservancy. At the Party Congress, General Secretary Xi Jinping issued a series of important instructions on the protection, inheritance and promotion of the use of water culture, thus providing a basic guide for water culture construction and action. Only by promoting water conservancy spirit, inheriting water conservancy culture and popularizing water conservancy knowledge can we build bridges to construct water ecological civilization system. Water culture can be built with intangible cultural elements such as legends and stories of local water culture as the connotation, bearing in cultural plazas, landscape walls,

garden sketches and other tangible carriers, to create high-quality projects to show people the local water culture, carry forward the spirit of carrying on vigorous, persistent and continuous development.

5. Conclusion

Water is the soul of the city. People in the early construction of the city were based on water. All the major cities today are rivers. Rivers are closely related to the development of towns and cities. Rivers and lakes form ecosystems, are havens for birds and fish, not only provide wonderful viewing resources for humans, but also dilute pollution, purify the surrounding environment and, most importantly, have important implications for the development of local economies. The continued existence of rivers means that cities have soul, ecological security and economic development, all of which are essential for the sustainable development of society. Governments can be called upon to protect water resources, to combat water pollution and, if necessary, to take judicial action in cases of human-induced ecological damage to water.

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