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Application and Exploration of Water Ecological Restoration Technology in River Management

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Abstract: In the water ecological restoration technology, protecting the ecological environment is its core technology. The use of plants and animals to biologically treat water bodies can biodegrade water bodies, thereby realizing pollution control of water bodies. Since industry and life will pollute the river to a certain extent, in the treatment of the river section, the factors of industry and life should be fully considered, and comprehensive ecological restoration technology should be adopted to maximize its function. This paper makes a comprehensive analysis of river ecological governance technology, in order to have certain guiding significance for the work of relevant departments.

Keywords: Water Ecological Restoration Technology; River Management; Exploration

Introduction

At present, due to the existence of various pollution factors, the water environment in our country has been seriously polluted. For example, some polluted rivers have a pungent smell, which has a great impact on the surrounding environment; in some lakes, due to the eutrophication of water bodies, a number of cyanobacteria blooms. To this end, the river must be managed to ensure the green and pollution-free human habitation. After several years of practice, a variety of wastewater treatment technologies have been widely adopted. Among them, water body remediation technology is currently the most widely used technology in the field of environmental protection due to its low investment. To this end, the relevant departments must innovate and research the restoration technology of water resources to ensure its application in river management.

1. Discussion on related concepts of water ecological restoration

Under natural conditions, a complete aquatic ecosystem consists of the following four aspects: first, a certain scale of aquatic plant community; second, a certain scale of various aquatic organisms; third, a variety of microorganisms exist in the system and fourth, there are many protists in this system. The essence of water ecological restoration technology is to achieve the degradation of pollutants in the water body by systematically cultivating different types of plants and aquatic organisms in the polluted area, so as achieve the purpose of improving water quality and restoring water pollution. This technology has been widely used internationally. The practical application shows that the repair cost is low and the treatment effect is good. In river management, the existing pollution sources should be effectively controlled, and water ecological restoration technology should be used to restore the damage to the river, control pollution from the source, destroy the river environment, and restore the ecological environment.

2. Types of water ecological restoration technologies

2.1 Biological treatment technology

Bioremediation technology refers to the restoration of water ecosystems through submerged plants, emergency plants, floating plants, aquatic animals and microorganisms. Submerged, floating and emergency plants provide habitat for fish and absorb nitrogen and phosphorus; aquatic animals such as snails, mussels and crayfish, which often eat decaying flora and fauna in the river, are equivalent to A cleaning agent; all kinds of aerobic bacteria, anaerobic bacteria, photosynthetic bacteria,

etc. are activated sludge in wastewater treatment. Due to the characteristics of biological treatment technology, its applications are not the same, so it is very necessary to select an appropriate biological treatment technology according to the actual pollution conditions and treatment methods.

2.2 Technology of Constructed Wetland

This technology is based on natural ecosystems and uses chemical, physical and biological technologies to efficiently purify water sources. The filling layer of constructed wetlands is based on soil and fillings, and in the gaps between the fillings and fillings, water can pass through to a certain extent. In addition, in order to achieve efficient utilization of sewage, some aquatic plants with excellent water quality and high survival rate can also be planted on the water surface. The technology has the following characteristics: first, to ensure biodiversity; second, to degrade and purify the pollutants in the water body; fourth, to optimize the ecological environment. Using this technology, the local environment and climate have been effectively adjusted, and the effect of purifying water quality has been achieved. The establishment of constructed wetlands is of great significance to the control and maintenance of biodiversity in ecosystems. The use of this technology has improved the ecological environment of the water body and played a great role in the purification of the water body.

2.3 Constructing ecological bank slope

In water conservancy projects, ecological bank protection technology is a commonly used technology. With the enhancement of environmental protection awareness, ecological bank protection is widely used in water conservancy construction. It is an important ecosystem that can protect the environment very well. Fully absorb various environmental protection technologies and concepts, and formulate corresponding countermeasures according to the specific conditions and characteristics of construction projects. In the construction of ecological bank slopes, the living conditions of different species should be fully considered in order to facilitate the healthy development of river ecosystems and to control them effectively.

3. Analysis of the status quo of application of river management technology

The phenomenon of “straightness”straightness and “flatness ” of the current river channel shape in my country is very prominent. Existing rivers have lost their original natural form and the natural characteristics on which many living things depend. At present, with the increasingly serious water pollution, the purification capacity of river water has been unable to keep up with its pollution level. Most of them have water quality above Category 5 or worse. The ecological environment of rivers has been severely damaged, and some river water has become a pure water source, and where the river water flows, it will cause damage to the ecological environment. In most river projects, the first priority of floods is flood control, so many high-straight protection projects have been established. At the same time, due to the relatively single river surface conditions and the small amount of water in the river, the ecological environment of the river has become increasingly prominent, which has caused great damage to the ecological environment of the river. Overall, ecological issues have become a major issue in river governance. When restoring the river system, it should start from the two aspects of ecological exchange and reconstruction, so as restore the river course comprehensively and efficiently.

Among the technologies commonly used in the world to deal with river pollution, it is generally believed that the harmonious coexistence between man and nature can be achieved by improving the natural purification ability of nature. Ecological restoration refers to the use of relevant principles and technologies of ecological engineering to control the water volume and flow in the river basin by means of river water pollution. By changing the ecological environment of the river, the ecological diversity of the river can be restored and a benign balance of natural ecology can be achieved. This method has low investment, high efficiency, simple operation and great potential.

4. Measures for river management by water ecological restoration technology

4.1 Clarify the choice of plant species

Different rivers are polluted and damaged to varying degrees. Therefore, during the treatment, appropriate technical measures should be taken according to the actual pollution status of the river to carry out ecological management and restoration of the river. China has a vast territory, and the diversity of plants varies greatly from region to region. During management, the local natural conditions should be fully considered, and suitable plant varieties should be reasonably selected to ensure their growth in the planting area. If the precipitation in the north is small, varieties suitable for arid and low temperature climates should be selected; in places with a lot of rainfall in the south, drought-tolerant varieties should be selected, and plants that can purify water should be selected. Also, pay attention to differences in plant species. There should be not only tall trees, but also low shrubs and small grasses, so that they can form a good ecological circle, so that the overall ecosystem can be improved. By optimizing the vegetation type, it can be ensured that the river ecosystem can adapt to the local geographical and climatic conditions to a certain extent, so that it has the maximum purification function.

4.2 Ensuring the Diversity of Biomes

River ecosystems are formed by extremely complex and long-term evolution. Once it is contaminated, it becomes very difficult to repair it, and it will last for a long time. To this end, it is necessary to formulate long-term plans and policies from a long-term perspective, increase the determination of river management, stabilize river management, and gradually implement corresponding management measures. Before restoring the river, it is necessary to conduct a comprehensive investigation and analysis of the original form and biological community of the river, put forward scientific and reasonable evaluation methods, and determine the corresponding work priorities; the river management department must give full play to the rich ecological and biological resources of the river to ensure Its survival and symbiosis in the river makes all kinds of organisms become a unified organic whole, which promotes and develops each other.

4.3 Pay attention to the balanced development of animals and plants

Clearly, the forces of nature alone cannot restore the polluted river to its destroyed before ecological level. Therefore, it is necessary to fully realize the comprehensive application of various technologies. For the seriously polluted areas, corresponding technical measures should be taken as soon as possible, and treatment should be carried out as soon as possible to prevent further environmental damage. Taking the river as the center, the reasonable layout of buildings and vegetation can not only maintain the ecological environment, but also bring more beautiful landscapes to towns and villages. Pay attention to the connection of the food chain, improve the surrounding environment, create a suitable living space for the surrounding animals with plants, and ensure the balanced development of biodiversity, thereby improving the ecological quality of the water body.

5. Conclusion

China is in the process of rapid urbanization and industrialization, and the water ecological environment is also facing many challenges and risks. Water ecological restoration technology is an effective way to improve the quality of water resources and restore water bodies. It plays an important role in the restoration and management of rivers. From “traditional restoration”to“ecological restoration”,its development direction is very advanced.

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