

Disposal Method of Urban River Dredged Sediment and Its Role in Landscape Planting

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Abstract

A large amount of sediment is produced every year in urban rivers. Dredging technology is the most widely used method for ex-situ treatment of sediment. The disposal of dredged sediment is also very important. If it is not handled properly, secondary pollution will result. Since the sediment contains nutrients such as N and P required by plants, the dredged sediment can be combined with plant cultivation, which is an ecological treatment method.

Keywords

City, Dredged sediment, Plants.

1. Introduction

Urban rivers refer to rivers or river sections that originate in urban areas or flow through urban areas. Their interaction with human beings is frequent and strong. It is an important part of urban resources and plays an important role in the development of cities. With the rapid development of society and economy, a large amount of domestic sewage, industrial wastewater and urban runoff carry pollutants to rivers, resulting in the gradual deterioration of river water quality and river pollution. Urban river pollution is a common environmental problem currently in the world. Urban rivers in most countries and regions are polluted to varying degrees, the living environment of aquatic organisms has been damaged, and the ecological functions of urban rivers have also been seriously affected.

The complete concept of river water body includes overlying water, sediments at the bottom of the water body, and various environmental conditions. After entering the water body, pollutants eventually settle in the sediment and accumulate through various methods such as sedimentation, adsorption, and biological absorption. The sediment is the ultimate storage place for various pollutants in the water environment. Pollutants in urban river sediments contain nitrogen and phosphorus nutrients, organic pollutants and heavy metals. Material exchange and energy exchange are continuously carried out between the sediment and the overlying water. Various pollutants in the sediment and the overlying water also maintain a dynamic balance of absorption and release. Once the environmental conditions change, the pollutants will be re-released by means of analysis, diffusion, and disturbance. Therefore, the research and treatment of sediment pollution is an important part of the comprehensive management of urban river pollution, and it is one of the important ways to fundamentally solve the problem of river pollution.

2. Sediment Repair Technology

The remediation technology of polluted sediment in urban rivers can be divided into two methods according to different treatment methods: ex situ restoration and in situ restoration. Ex situ restoration refers to the removal of contaminated sediment from the river channel and then to a special place for corresponding treatment. Remediation method, in-situ remediation refers to the technology for pollution treatment in situ without removing contaminated sediment from the water body. Dredging technology is the most widely used ectopic treatment method. Because it can completely remove pollutants from the water body, the technology can greatly reduce the contribution of sediment to the overlying water body pollution. Compared with in-situ treatment technology, sediment dredging technology is relatively mature, which can quickly and thoroughly remove polluted sediment and refractory pollutants. At present, the amount of dredged sediment produced by dredging projects in China is increasing. For example, Shanghai alone requires 100,000 cubic meters of sediment to be treated in Suzhou River, and 1 million cubic meters of sediment to be dredged in comprehensive treatment of Taihu Lake and Dianchi Lake. The dredged sediment produced in the zone reaches 80 million cubic meters per year. The dredged sediment produced by the dredging project has the characteristics of large amount of sediment, high water content and complex composition. If it is not handled properly, secondary pollution is likely to occur. Therefore, the treatment and disposal of dredged sediment has become the focus of current attention.

The method of sediment dredging post-treatment needs to be combined with the degree of sediment pollution, including methods such as drying, solidification and stabilization, and resource treatment. If it is not handled properly, it can easily cause secondary pollution. (1) Drying of sediment: The water content of the mud after dredging is often greater than 90%, which does not meet the requirements for external transportation and subsequent use. Commonly used sediment drying and dehydration technologies include natural drying, mechanical drying and chemical drying. (2) Stabilization and stabilization of the sediment: Stabilization and stabilization is the mixing of the sediment and the solidification stabilizer to cause a chemical reaction to transform the contaminated components into chemically stable insoluble compounds or to be wrapped and fixed in the solidified body to improve the bottom after the treatment. The hardness and stability of the mud. Commonly used are cement curing stabilization and phosphate curing stabilization. (3) Sediment resource utilization: ① Directly used as soil: After solidification and stabilization of the sediment, the moisture content, heavy metal content, mud strength, stability and shear force and other indicators reach the standard, it can be used as soil for construction land Utilization; the sediment contains a large number of nutrients and trace elements necessary for plant growth can be used as agricultural land soil; the sediment after the standard can also be used to build wetlands, and plant wetland plants as habitats for wild animals. ② Sediment compost utilization: It can be mixed with organic fertilizer and inorganic fertilizer to make compound fertilizer. ③ Sediment making building materials: The use of sediment to make bricks, cement, ceramics and other building materials is a treatment method that turns waste into treasure. Under high temperature conditions, the inorganic silicate minerals in the sediment will melt, and heavy metals, etc. Contaminants are encapsulated within the glass matrix of the building material.

3. Ecological Disposal of Sediment

The resource utilization of the sediment and the conversion of waste to treasure are the future trends of sediment treatment. At present, there are still a lot of technical problems to be overcome. How to make the dredged sludge recyclable under the premise of respecting nature, non-toxic and harmless, how to organically combine the pollution degree, physical and chemical properties, and local environment, economic technology, and other conditions of the

dredged sludge, and select the sludge for the local use The method is a subject worthy of further study.

Because the eutrophic properties of the sediment ensure the content of organic elements, nitrogen, phosphorus and other nutrient elements, which are suitable for plant growth, it is a potential resource. Therefore, combining the problem of sediment treatment with urban greening projects can not only relieve the urban landscape The problem of large engineering cost caused by the large number of plants and wide planting area is more important to find an ecological method for the resource treatment of urban dredged sediment. In view of this, it is of certain economic, social and ecological significance to carry out research on the utilization of sediment resources based on urban landscape planting.

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