Discussion on Problems in Water Pollution Prevention and Control and Optimization of Control Technology

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ABSTRACT: The rapid progress of modern industrialization has brought economic and social benefits to a certain extent, but also accompanied by serious environmental pollution, especially water pollution, which has caused serious damage to China's ecological environment. In the construction of ecological civilization, the prevention and control of water pollution is the key and difficult point, which should be focused on. This paper mainly discusses the current water pollution control measures based on the causes of water pollution prevention at the current stage and the existing problems.

1. Introduction

In the past, with rapid economic development, too much attention was paid to the development of urbanization and the negative effects on the environment were ignored. As a result, most of China's water resources were also polluted, and the supply of water resources in some areas was in short supply. If the problem of water pollution cannot be solved in time, it will further aggravate the negative impact of water pollution. With the proposal of the concept of green development, China has begun to attach importance to water pollution prevention and control, and has achieved remarkable results. On January 24, 2022, the Ministry of Ecology and Environment held a regular press conference, in which it was mentioned that the physical and chemical indicators of China's water environment have approached or reached the level of moderately developed countries.

2. Causes of Water Pollution

2.1 Industrial Wastewater Pollution

Industrial wastewater discharge is one of the main causes of water resources pollution, which is also the main source of pollutants in industrial production. It contains a large number of harmful substances, which are difficult to degrade naturally quickly, and will cause serious pollution and damage to water resources. At the same time, it is difficult to control the water pollution caused by industrial wastewater, mainly because the various pollutants contained in industrial wastewater are relatively complex, and there are many types of pollution caused by industrial pollution, which increase the difficulty of treatment to a certain extent.

2.2 Agricultural Production Pollution

Water pollution in rural areas mainly comes from chemical fertilizers and pesticides in planting, as well as feces in livestock raising. The overall education level of farmers is relatively low, and the awareness of ecological environment protection is relatively lacking. In crop planting, there is a lack of scientific and reasonable methods. Excessive chemical fertilizers, pesticides, and land development will not only cause damage to the soil structure, but also easily affect the quality of the soil itself. At present, China's agricultural production efficiency has been greatly improved. With the continuous promotion of large-scale planting, agricultural production has become increasingly dependent on pesticides. These residual chemicals are easy to deposit in the soil, causing pollution to the soil. Especially in heavy rain, loose soil will be impacted by rain, which will easily lead to turbidity of river water, and fertilizer and pesticide will also pollute the water flow.

2.3 Municipal Pollution

From the development in recent years, the urban pollution problem has become increasingly serious, and the economic development has also improved people's quality of life to a certain extent. The water consumption has increased significantly, and the sewage discharge is in direct proportion to the water consumption, which also significantly increases the difficulty of sewage treatment. Compared with the previous urban wastewater, the composition of the sewage produced by modern urban residents is relatively complex. People use a large number of chemical cleaners such as shower gel and laundry detergent in their daily life, which will also pollute the water body and increase the difficulty of sewage treatment. Moreover, such chemical costs are difficult to be degraded, thus causing varying degrees of impact on the ecological environment.

3. Prevention and Control of Water Pollution in China

3.1 Lack of Attention to Sewage Prevention At the Social Level

At present, there are still many problems in the actual work of water pollution prevention and control, and the local government has not formed a standardized and binding management; It is difficult to implement the regional compensation policy in place, and the treatment of illegal enterprises is obviously insufficient, and the rights and responsibilities of local governments for water pollution prevention have not been clearly pointed out, which will affect China's water resource governance. In the prevention and control of water pollution in China, public participation is relatively low, and some residents still do not discharge sewage according to the specifications, which will also hinder the progress of water pollution control. For example, the Law on the Prevention and Control of Water Pollution emphasizes the participation of the masses, but only gives the masses the right to report, and does not clearly point out the place where the masses report and the time for verifying illegal water pollution, which limits the exercise of supervision functions by grassroots people.

3.2 Imperfect Regional Prevention and Control Mechanism

In terms of water pollution control, there are relatively many departments involved. In addition to the local government, there are also coordination and cooperation between environmental protection departments and financial departments. Some regions lack a comprehensive water pollution prevention mechanism. Water pollution prevention and control work is superficial, not implemented in place, and the allocation of rights and responsibilities is not clear, which is specifically reflected in the division of areas and financial division in financial water pollution control work. The prevention and control of water pollution is relatively systematic, complex, specific, and uncertain. New problems of varying degrees will arise in the process of governance. Therefore, adequate funds are needed, as well as the joint participation, cooperation and collaboration of multiple departments. Many regions lack corresponding perfect mechanisms, which makes it difficult for different departments to work together and affects the effectiveness of water pollution prevention.

3.3 Imperfect Treatment Measures for Industrial Water Pollution

The cooperation between local governments and local enterprises is relatively close, and some large enterprises provide greater support for local economic development. Therefore, it is easy for the government to fall into a dilemma for local wastewater treatment. On the one hand, the government should deal with local water pollution in a timely manner; On the other hand, the government is more worried about the large-scale transformation of enterprises, which will affect the local economic benefits, which easily increases the concern of local governments, which is also the main reason for the water pollution of some enterprises.

3.4 Relative Lack of Prevention and Control Measures for Urban Domestic Sewage

With the continuous progress of urbanization, the quality of people's life has significantly improved. In this context, the impact of human living environment on the ecological environment is also growing. This is mainly due to the rapid growth of urban domestic sewage discharge, which increases the difficulty of sewage treatment. If the urban domestic sewage does not meet the standard, it is easy to pollute the local available water resources.

3.5 Lack of Management of Water Pollution Prevention in Agricultural Production

From the development in recent years, the water pollution caused by agricultural production is quite important, and the prevention and control of water pollution is lack of useful technology, and most local farmers lack the awareness of ecological protection, and lack a clear understanding of water pollution prevention, which leads to the difficulty of using water resources in a scientific and reasonable way in actual agricultural production and life, so the difficulty of local agricultural water pollution control is increased to a certain extent. Moreover, most of the business entities in rural agricultural areas are not centralized, which leads to the obvious lack of regulatory measures and hinders the treatment of water pollution.

4. Optimization Strategy of Water Pollution Prevention and Control Technology

4.1 Improve the Attention Paid by All Sectors of Society to Water Pollution

Seen from the current water pollution prevention and control work in China, the government and most social departments pay enough attention to it, but they lack sufficient support in the actual regulations and related policies. However, in the ecological environment, the harm caused by water pollution does not appear quickly, and the governance process also needs a long period to see the corresponding results. It can be seen that many cities do not pay enough attention to the prevention and control of water pollution, and are unwilling to invest more energy in the prevention and control of water pollution. This will easily affect the effectiveness of water pollution prevention and control, and all departments should pay more attention to it. Among them, local governments can issue a series of regional prevention and control policies for publicity and guidance, coordinate with multiple departments, and work together to improve the effectiveness of water pollution control.

4.2 Improve the Coordination and Management Mechanism of Regional Departments

The prevention and control of water pollution has been carried out for a period of time, but there is a big difference between the actual and the expected, and different types and degrees of water pollution treatment methods are also obviously different. The specific implementation of the treatment measures is facing many obstacles, including some objective factors, and also some subjective factors that are difficult for many departments to coordinate. It can be seen that during the actual treatment of water pollution, a relatively complete water pollution prevention and control system has not been formed in most regions. During the specific water pollution prevention and control period, it is difficult for the relevant departments and their units to play a leading role. Therefore, the coordination mechanism between various departments in the water pollution prevention and control work should be optimized, and the effective management of water pollution work by various departments should be strengthened to ensure that the water pollution control can be effectively implemented.

4.3 Optimization of Industrial Water Pollution Prevention Technology

At present, industrial wastewater discharge in China is also increasing, especially in fossil chemical enterprises and equipment manufacturing enterprises. The production and operation of these enterprises will have a great impact on the ecological environment. Therefore, the local government needs to pay enough attention. However, due to financial constraints, the treatment of industrial wastewater pollution has always been a major problem. Local governments should provide adequate financial support, and water pollution treatment enterprises should also use more new treatment technologies when conditions permit. For the prevention and control of water pollution, some alkaline substances, such as lime and slag, can be appropriately added to the

polluted water body to react with the acidic metals in the sewage, and the pH of the polluted water body can be adjusted to a certain extent. At the same time, it can also be combined with practice to deal with the problem of sediment solidification, which is very effective for sewage control.

4.4 Optimization Technology of Urban Sewage Prevention

With the increasing discharge of urban wastewater in China, people's living standards have been improved and various cleaning reagents have been used, leading to the increasingly complex treatment of urban domestic sewage. Therefore, more new technologies should be adopted in combination with the actual situation. For water pollution prevention and control, physical prevention and control measures can be used, and the application effect of sewage interception and diversion technology is obvious. In specific practice, urban sewage pipes are mainly used to reasonably control urban sewage and ensure the effectiveness of management. Therefore, based on the actual situation, we should reasonably plan the urban sewage drainage pipeline, so that it can be put into practice, ensure that the separate sewage interception and drainage can be effectively implemented, and strengthen the effectiveness of sewage prevention. In general, we will strengthen the construction of sewage intercepting pipelines, pumping stations, etc., and make rational use of them, which is the basic premise to ensure the effective use of this technology.

Sewage purification and regeneration can meet the needs of urban water use to a certain extent. With the development of chemical technology, the chemical structure of pollutants in sewage is relatively complex, and the concentration and turbidity of sewage are also significantly improved. The traditional primary treatment technology and secondary treatment technology are difficult to meet the needs of current sewage treatment. It can be seen that SPR high turbidity sewage treatment technology has emerged as the times require, which is a combination of chemical and physical sewage treatment technology. First, the colloidal particles and suspended particles in the pollutants are separated by chemical reagents, and then the separated colloidal particles and suspended particles are transformed into large flocculent objects by the method of physical adsorption. After filtering, swirling and other methods, the flocculent objects are separated, and clear water can be obtained through filtering. Next, SPR technology can be used for treatment to reach the standard of Grade III water. This part of water can be used for urban greening, industrial production, green land irrigation, and vegetation growth. The generated sludge can be made into sidewalk tiles to avoid secondary pollution. The relevant data indicate that the SRP technology can achieve a BOD removal rate of more than 90%, a SS removal rate of 100% and an effluent turbidity of less than three degrees. It can be seen that the application of SRP technology is quite effective for sewage treatment. And these data still reach the corresponding effluent standard under the condition of low investment, which is also an incomparable part of the current conventional primary and secondary treatment, so SPR can be used as the optimal scheme for urban sewage treatment.

4.5 Optimization of Water Pollution Control Technology in Agricultural Production

During the agricultural production period in China, the water pollution is quite serious, but most of the farmers in China are self-employed, which is difficult to manage scientifically, so it is easy to increase the difficulty of water pollution control. The way of water pollution caused by agriculture requires the local government to increase efforts to establish sewage treatment measures in rural areas, further reduce the use of pesticides, adapt to green agriculture as much as possible, and promote the further transformation of agricultural production. Special sewage treatment base stations can be established around large agricultural production areas to further control water pollution in agricultural production and prevent further diffusion of agricultural water pollution. For example: solidification microorganism method. The solidification microorganism method mainly uses the strong adsorption of microorganisms gathered in a certain area to treat sewage. This method requires microorganisms to keep high sparks to effectively adsorb and solidify pollutant targets. The amount of sludge obtained through this method is relatively small, which is also convenient for subsequent treatment and has less pollution to the subsequent environment. Moreover, the solidified microorganism itself has environmental protection characteristics and can also be recycled, which is more in line with the concept of green development. The current

application scope of this method is relatively small, but under the current development of green economy, there is still much room for the development of solidified microorganism method.

5. Conclusion

There are many ways of sewage treatment, among which the microbial treatment is relatively new. Compared with the traditional sewage treatment methods, the biological treatment method is more environmentally friendly. Although the treatment efficiency is relatively low, the treatment quality is relatively high, and secondary pollutants are not easily generated. It is very suitable for being put into the urban water reuse system, which is more in line with the basic requirements of current sustainable development. Therefore, the use of biotechnology to treat sewage requires careful screening in combination with the types of pollutants, so as to suit the remedy to the case, in order to improve the effectiveness of sewage treatment.

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