

Discussion on Existing Problems in the Total Amount Control of Water

Pollutants in China

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Abstract: The basic concept of total amount control of water pollutants was first illustrated, and then the development history of the concept of total amount control management system in China was summarized. After that, the existing problems in the total amount control in China were analyzed. Finally, the development prospects of research on the total amount control of water pollutants in China were described.

Keywords: Water pollutants, total amount control

1. INTRODUCTION

The total amount control of water pollutants refers that total pollutant load is controlled within the carrying capacity of natural environment through controlling total pollutant discharge and taking the corresponding pollutant disposal measures according to natural environment of one basin, region or area and its self-purification capacity and environment quality standards. It consists of three elements: total amount of pollutant discharge, pollutant discharge region and pollutant discharge time ^[1]. The guideline for total amount control of water pollutants is to take administrative, economic and technical measures based on the socio-economic development status of the basin or region to gradually control the total pollutant discharge within the capacity of water environment. As far as the method is concerned, the planned management measures are taken through controlling the allowable pollutant discharge in some region and optimizing the distribution of pollutants, hence achieving the expected water environment quality objective ^[2].

2. HISTORY AND CURRENT SITUATION OF TOTAL AMOUNT CONTROL

The total amount control of pollutants was originally proposed in Japan in the 1960s and developed in Japan, Europe and the United States in the 1970s, and finally it has been gradually

implemented in the environmental management ^[3, 4, 5]. The research on the total amount control of water pollutants in China began in the late 1970s; the earliest exploration and practice was based on the development of standards for BOD total amount control of the First Songhua River. In the “Sixth Five-Year” period, on the basis of taking Tuojiang River as the research object, the research on water environment capacity and total pollution load distribution and the quantitative evaluation of water environmental capacity were conducted. In the “Seventh Five-Year” period, the study on water environment function areas and discharge permit releasing were conducted successively in the Yangtze River, Yellow River and Huaihe River and other waters such as Baiyangdian, Jiaozhou Bay and Quanzhou Bay based on the total amount control plan. In the mid-1980s, some explorations on the self-purification capacity and environmental capacity of environmental pollutants in the offshore areas were carried out in China. The former National Environmental Protection Bureau (SAA) organized the research on the self-purification capacity of marine environmental pollutants in the “Seventh Five-Year”. In March 1988, the former National Environmental Protection Bureau issued the *Interim Measures for Water Pollution Discharge Permit Management* centering on the total amount control and notice on carrying out the pilot work for discharge permit, which marked that China began to enter a new stage of the total amount control and water environment management enhancement. In 1996, the “*Ninth Five-Year*” *Plan for National Economy and Social Development and Outline of Long-range Objectives for 2010* was adopted at the National People’s Congress, in which the total amount control of pollutants was officially taken as a major measure of environmental protection in China. In accordance with the problems and situations in the implementation of total amount control, the State Council promulgated the *Regulations on the Implementation of Water Pollution Prevention and Control Law* on March 20, 2000, in which the detailed and more feasible regulations on total amount control were stipulated in some clauses. The *National “Eleventh Five-Year” Plan for Environmental Protection* was published in 2007, which was a historic transformation in environmental protection promotion through the total amount control work. It transformed from traditional GDP growth and total amount balance planning to the plan focusing on regional coordinated development and promotion in the transition of economic development method. The State Council promulgated the statistical, monitoring and assessment methods for total amount control of pollutants (such as *Monitoring Methods for Total Discharge of Main Pollutants*, “*Eleventh Five-Year*” *Verification Methods for Total Discharge of Main Pollutants* (trial)) and began to implement the responsibility system for discharge reduction targets, laying the foundation for discharge data accounting ^[2, 6]. Over 40 years, the total amount control of water pollutants has gradually become one major measure for water environment management in China, which plays an important role in urging local governments to mutually coordinate in developing economy and protecting environment.

3. EXISTING PROBLEMS IN THE TOTAL AMOUNT CONTROL OF WATER POLLUTANTS IN CHINA

It is an effective way to exercise the total amount control over regional water pollutants, which helps reduce and distribute pollutants in the river basin. As the pollutants in the area can be effectively controlled within the environmental carrying capacity, the quality of water environment in the river basin can be effectively improved. However, in the implementation of the total amount control system, affected by various factors, there are still some urgent problems and difficulties, which are reflected mainly in the following aspects:

(1) In the current total amount control, the focus is mainly on the industrial point source instead of domestic pollution source and agricultural sources and other non-point source pollution. Moreover, in the industrial point source pollution control, not all the industrial pollution sources can be monitored online; only those enterprises under national control, provincial control and municipal control have established the online monitoring systems for pollution discharge. As some small and medium enterprises fail to establish the corresponding online environmental protection monitoring systems in the planning investment, their pollution discharge situations can be monitored and known only through the routine monitoring of the environmental protection monitoring department. So the consecutive 24-hour uninterrupted monitoring is not available. The relevant departments finally fail to obtain comprehensive and accurate information on pollutant control and discharge as well as total annual amount of pollutants in the region and river basin.

(2) The basic data of total discharge reduction are not solid. During the “12th Five-Year Plan” period, the total discharge reduction all over China had been based on data from the first China Pollution Source Census conducted in 2010. But due to tight schedule, heavy task and enterprises’ insufficient awareness of environmental problems, the statistical results in the first China Pollution Source Census were not satisfactory to some extent; and its obvious disadvantages were distortion and omission. On this basis, the formulated standards for discharge reduction proportion and amount were not consistent with actual situation^[7].

(3) The capacity gross control is replaced with the environment target gross control. At present, the target gross control is dominant in China’s pollution discharge reduction. The control target is a kind of responsibility target established by the administrative department as the main body, which is characterized by strong administrative intervention and clarity and ease to achieve. The target gross control of pollutants, to a certain extent, alleviated the pressure the environmental pollution brought to human environment; however, in the development process, as the environmental carrying capacity in the region or basin was not thoroughly considered, there is no way of fundamentally solving the problem that the pollution discharge had brought damage to the limited environmental capacity.

(4) The total amount control indicators of water pollutants are extremely limited. The total amount control of pollutants as an environmental protection policy was proposed in the “Ninth Five-Year Plan” period; at that time, there were eight indicators (COD, petroleum, cyanide,

arsenic, mercury, lead, cadmium and hexavalent chromium), but a long-term effective mechanism for supervision and management has not been formed. In the “Eleventh Five-Year” period, COD was listed as a binding indicator for total amount control of water pollutants; in the “Twelfth Five-Year” period, NH₃-N was listed as a binding indicator for total amount control of water pollutants. The water environment quality has improved to some extent, but the total amount control of main pollutants such as phosphorus and some heavy metals which do harm to water environment and human health has yet not been excised. As a result, some water fails to fully meet the the industrial and living requirements in terms of utility.

4. CONCLUSION AND ANALYSIS

Since the implementation of total amount control, we have made great progress in the control of water pollutants and alleviated the deterioration of water environment in key river basins and regions. With further advance of total amount control work of water environment in China, for some prominent problems, we must gradually seek solutions. For the research on total amount control targeted at improvement of water environment, we consider as follows:

(1) If we only focus on target gross control but ignore the capacity of the water itself, we will fail to meet the target requirements for water environment improvement. But the great-leap-forward or one-step implementation of total amount control was not appropriate in China. According to the existing economic conditions and the current water pollution situation and adhering to the principle of seeking truth, we should combine three methods at the present stage: industry gross control, target gross control and capacity gross control to construct a comprehensive model for total amount control at the premise of dynamic water quality objects; meanwhile, the calculation of water environment capacity in each region or basin is conducted, laying a good foundation for taking environmental capacity as the basis for total amount control.

(2) The breadth and depth of total water pollutant control shall be intensified. The control over discharge of water pollutants from agricultural sources shall be enhanced; the scale of rural livestock and poultry breeding shall be controlled; those livestock and poultry farms should be encouraged to adopt the waste recycling model for producing biogas and compost. The on-line monitoring system for water pollution enterprises shall be gradually established in some areas and basins meeting the relevant conditions. In addition, for the water-related production enterprises, 24-hour uninterrupted monitoring shall be implemented.

(3) On the basis of scientific research, the indicators for total amount control of water pollutants shall be gradually increased. As industrial and agricultural types and environments all over China are quite different, characteristic factors of water pollution vary greatly. So, according to the types of water pollution and local environmental carrying capacity and on the basis of comprehensive consideration of local economic development level, we should increase the types of factors for total amount control of water pollutants in the regions or basins and carry out the total amount control work of water pollutants adapting to local conditions.

(4) Preparations for the second China Pollution Source Census shall be well made to ensure that the statistical data are true and comprehensive. Through the reflection on problems and shortcomings in the first China Pollution Source Census, we should carry out the relevant work intentionally and strategically in terms of technical staff allocation, funding sufficiency and software updating.

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