

## Research on construction of performance audit evaluation index of water pollution prevention and control

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**Abstract:** With the increasing threat of water pollution to public health and safety, in order to investigate the effectiveness of the government to fulfill the responsibility of water pollution prevention and control, the performance audit of water pollution prevention and control has gradually become an important responsibility of audit institutions. Because of the imperfection and unsystem of audit evaluation index, the evaluation and supervision function of performance audit of water pollution prevention and control is seriously hindered. Therefore, based on the new public management theory and centering on the process of "policy implementation - fund raising and use - project construction and operation - target and task completion" of water pollution prevention and control, this paper constructed the performance audit evaluation index system of water pollution prevention and control, in order to provide reference for related performance audit of water pollution prevention and control.

### 1. Introduction

Water pollution prevention and control is one of the important projects that the government does for the people. At present, water pollution still exists in major river basins in China, and various kinds of pollution pose increasing threats to public health and safety. In order to improve the quality of water environment and further improve residents' living standards, local governments have successively issued special policies and invested huge amounts of money in water pollution prevention and control. As an independent supervision and evaluation activity, audit is necessary to evaluate the economy, efficiency and effectiveness of water pollution prevention and control and put forward suggestions. With the development of government performance audit of water pollution prevention and control, China has made breakthroughs in this field. At present, most domestic scholars focus on the definition, content and methods of performance audit of water pollution prevention and control, and a few scholars carry out more in-depth research on its evaluation index system. Due to the lack of evaluation index system, the performance audit of water pollution prevention and control is difficult to achieve its evaluation and supervision goal, and cannot effectively supervise the performance level of government water pollution prevention and control activities. In order to help relevant government departments improve the efficiency of water pollution prevention and control, this paper intends to establish a set of performance evaluation index system centering on the whole process of water pollution prevention and control.

### 2. Construction principle of indicators

Water pollution prevention and control is a project to benefit the people. Government departments control the public resources of water pollution prevention and control. It is an important responsibility of the government to ensure the scientific, efficient and accurate use of water pollution prevention and control resources to benefit the public, and paying high attention to the performance and responsibility of the government is the core feature of the new public management theory. The new public management advocates that the government should take the market or the public as the guidance, use the cost-benefit analysis method to determine and evaluate

the government work performance, improve the government service efficiency, and build the government with public satisfaction. The organic combination of performance audit and water pollution prevention practice can evaluate and supervise the implementation of government water pollution prevention policy, fund management and use, and project operation benefit, and minimize the interest difference between the government and the public. This theory provides a new idea and value orientation for the design of performance audit indicators of water pollution prevention and control.

### **2.1. The principle of public guidance**

The goal of performance audit of water pollution prevention and control should be shifted from the government and audit institutions to the public. In the performance audit evaluation of water pollution prevention and control, residents' evaluation of water environment quality and pollution prevention and control and their satisfaction degree shall be included in the audit evaluation criteria.

### **2.2. The principle of combining results with process**

The new public management model emphasizes the goals and results, so it must pay attention to the process control and staged output of water pollution prevention and control, so as to objectively and comprehensively evaluate the achievement degree of the performance goals of water pollution prevention and control projects.

### **2.3. The principle of combining quantitative and qualitative**

In the evaluation, the qualitative and quantitative evaluation will be considered comprehensively, and the factors that cannot pass the quantitative evaluation will be embedded into the performance audit evaluation system of water pollution prevention and control through the qualitative method, so as to achieve the comprehensive evaluation from multiple perspectives and improve the evaluation quality.

## **3. Construction of performance evaluation index system for water pollution prevention and control**

Chinese scholars' research on related performance audit evaluation index system can be roughly divided into three aspects: first, the PSR model is used to build evaluation index system; second, the balanced scorecard and its principles are used to build evaluation index system; third, the evaluation index system is built around "3E" or "5E". These performance audit evaluation index system is the core content of the performance evaluation of universal economy, efficiency, effect, and considering the environment effect, but the build the evaluation index system are not necessarily correspond to audit content in the practical work, may be deviated from the actual work, is not conducive to guide the practice of water pollution prevention and control performance audit work. Therefore, in this paper, on the basis of the related research results, using the method of field investigation, expert interview, according to the specific audit content, water pollution prevention and control of performance audit, capital management, project benefits from the policy implementation and the target task to complete four aspects set, around "policy evaluation - money - project evaluation - goal task completion" the entire process of execution, The performance evaluation index system of water pollution prevention and control is constructed.

### **3.1. Policy performance indicators**

When auditing the implementation of policies and systems, focus on investigating whether local governments have implemented relevant policies of the central and provincial governments properly. Specific indicators include: whether according to the requirements of the introduction of the implementation of superior policy opinions related documents, whether the development of water pollution prevention and control specific plans and implementation plans, there is no entity operation and the office of special personnel, through the meeting minutes to check whether the meeting to study water pollution prevention and control problems. At the same time, we will focus

on inspecting the implementation of the river chief system, compensation for ecological protection, compensation for ecological and environmental damage, red lines for ecological protection, shoreline development and management, and sewage discharge permits.

### **3.2. Fund performance indicators**

Audit the fund management mainly on the fund-raising, allocation and use of special funds for water pollution prevention and control, focusing on the availability rate and fund-raising rate of funds for water pollution prevention and control, whether there is idle funds, whether there is embezzlement or corruption; Whether the financial departments timely disburse funds, whether there is the problem of withholding and deducting funds; Whether there are false transactions between the competent departments of water pollution prevention and control projects and project units for capital arbitrage and so on. The set indicators are: fund allocation rate, fund utilization rate, fund allocation schedule compliance rate, illegal fund ratio, fund utilization rate, budget expenditure completion rate;

### **3.3 Project performance indicators**

The audit of water pollution prevention and control projects includes verification of the construction situation of sewage treatment projects, the source of funds for pollution control projects, and supervision of the quality and operation rate of pollution control projects. Specific indicators include the construction status of sewage treatment projects (qualified rate of single project, completion rate of planned period, completion rate of designed capacity), the operation status of completed projects (investment payback period, utilization rate of designed functions, sewage treatment rate, pollutant reduction capacity);

### **3.4. Target task performance indicators**

For the performance audit of water pollution prevention and control objectives and tasks, including evaluation of the completion of binding indicators in water pollution prevention and control related planning, specific indicators are: In major rivers and lakes, the water quality of water functional areas is up to or better than class iii, the surface water quality is inferior to Class V, and the total amount of chemical oxygen demand emission is reduced, and the total amount of ammonia nitrogen emission is reduced. Changes in residents' satisfaction are also taken as indicators to achieve the targets of water pollution prevention and control.

## **4. Performance audit evaluation method of water pollution prevention and control**

In the performance evaluation of water pollution prevention and control, the advantages of various evaluation methods can be utilized according to different characteristics and evaluation aspects of the evaluation content to promote the organic combination of methods, so that the evaluation information is more comprehensive and the evaluation conclusions have more credibility and guidance. Based on relevant literature and supported by the new public management theory, this paper uses investigation method, public evaluation method, contrast method and comprehensive evaluation method to quantitatively evaluate the performance of water pollution prevention and control.

### **4.1. Investigation method**

The prevention and control of water pollution is a popular project, which should respect public opinion and serve people's livelihood. Interviews and questionnaires were used to find out whether water pollution prevention and control projects really improved water environment quality and residents' living environment .Make written records according to the answers of relevant personnel as the evaluation basis of water environmental performance.

### **4.2. Contrast method**

By comparing the performance target with the performance result, the historical situation and the

current situation, the achievement of the performance target is comprehensively analyzed and evaluated. For example, this paper evaluates the fund performance by calculating the fund raising rate and fund utilization rate and comparing them with the set performance goals. By comparing the changes of COD discharge and total ammonia nitrogen discharge in recent years, the control effect of total pollutants is analyzed. By comparing the pictures before and after water pollution prevention and control, the water quality of the functional area is evaluated, and whether the water environment has been significantly improved.

#### **4.3. The public evaluation method**

For some qualitative indicators, questionnaires can be used to investigate the benefits of water pollution prevention and control projects to judge their benefits. This method is mainly applicable to the evaluation of public facilities, which has the characteristics of democracy and openness. The water pollution prevention and control projects in this paper mainly involve sewage treatment plants and other public facilities. A questionnaire was designed to evaluate the performance of water pollution prevention and control, and residents' satisfaction was included in the audit evaluation.

#### **4.4. Comprehensive evaluation method**

Firstly, the index is screened, and then the weight of each index is assigned. According to certain weight value and index value, the comprehensive benefit index is calculated and evaluated. The comprehensive evaluation method has higher accuracy and more comprehensive evaluation results. In this paper, auditors score item by item according to the indicators of the whole process of water pollution prevention and control, and finally get a comprehensive evaluation of the performance of water pollution prevention and control.

### **5. Conclusion**

The development of performance audit evaluation of water pollution prevention and control is still in the embryonic stage and active exploration stage. Government environmental performance audit as a high-level audit, the environmental factors such as water pollution prevention and control into the performance audit, to achieve economic development and environmental protection of the dual goals. In order to promote the progress of water pollution prevention and control, it is necessary to construct performance audit evaluation index system. This paper puts forward a new evaluation index system to provide guidance for the development of performance audit evaluation of water pollution prevention and control.

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