Research on Drinking Water Sources Environment Protection Funds

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Abstract. Drinking water sources protection was related to human health. However, outstanding problems existed in effectively raising the funds needed to protect the drinking water sources. This paper aimed at summarizing the relevant experience and practices of drinking water source protection funds at home and abroad, proposing the preliminary conception of constructing government-led application of drinking water source environmental protection fund in China. The construction ideas were put forward from the aspects of source of funds, use of funds, and management methods of funds.

Introduction

Environmental protection of drinking water sources was an important part of ensuring the safety of drinking water and human health. At present, the sources of funds for China's drinking water source protection projects mainly include relevant national special funds, provincial financial funds and local financial funds. The amount of the money was not stable and the money was conditioned by multiple factors. It was difficult to form a stable protection mechanism for drinking water sources. Exploring the establishment of drinking water source funds was an effective way to establish diversified investment channels, and promoting effective supply of drinking water source protection funds.

Research Background and Significance

The use of funds at home and abroad had achieved remarkable results. It had been confirmed that government input alone was unable to solve complex environmental problems. It was especially important to stimulate the enthusiasm of enterprises and society for environmental protection. The United States had successful experience in using market-based mechanisms to solve water environmental problems. The Clean Water State Revolving Fund built in 1987 played a larger capital amplification role. It attracted corporate and social capital into the field of environmental protection. During the past thirty years, it Provided more than $89 billion in financing for the United States. In addition, the US Drinking Water State Revolving Fund had also played an important role in guiding social capital investment in the protection of drinking water sources. China's SME credit guarantee fund, which was established in Suzhou, Jiangsu and other places, had accumulated successful experience in breaking through the bottleneck of SME financing.

Research and promoting establishment of drinking water source environmental protection funds was important to absorb social capital and supplementary financial input. On the one hand, establishing a reasonable income mechanism to absorb the social capital. on the other hand, the fund could be used to support the drinking water sources protection engineering. The mode adopted could be free subsidy or Interest-free or low-interest loan. The fund could also encourage social capital to implement projects in PPP mode.
Domestic and Foreign Drinking Water Source Protection Fund Research

Stable Source Channels Ensure Continuous Injection of Funds

The Clean Water State Revolving Fund established in 1987 in the United States played an important role in Fund raising for drinking water protection. The federal and state governments injected capital in a 4:1 ratio, and the federal government contributed about $1.1 billion one year. The main sources of the Hazardous Materials Fund in the US Superfund included Petroleum and certain inorganic chemical industry taxation, the environmental tax imposed by the government and $220 million from federal finances. Taiwan, China established the Soil and Groundwater Pollution Remediation Fund in 2001. The fund came from petroleum-related compounds imposed on manufacturers and importers, also from treatment costs for about 125 chemical substances in 6 categories including chlorinated hydrocarbons.

Fixed and Clear Funding Was Conducive to Centralized Use of Funds and Significant Improvement in Effectiveness

State Drinking Water Revolving Fund established in the United States in 1997 was designed to help states and localities improve the infrastructure of drinking water systems, and also funding for various activities such as water source protection and water system management projects. The super fund established in the United States in 1980 to manage the large number of brown plots left after many companies moved. Soil and Groundwater Pollution Remediation Fund established by Taiwan in China in 2001 was designed to promote the measures of soil and groundwater pollution emergency, investigation and remediation.

The Use of Funds Based on Paid Use Was Conducive to the Appreciation of Funds and the Improvement of the Use of Funds

From 1987 to 2001, the US Clean Water State Revolving Fund provided a total of $34.3 billion in low-interest loans to 10,900 clean water projects. Through low-interest loans, the fund financed wastewater treatment projects for local governments, communities, small businesses, farmers and non-profit organizations. Nationally, the average interest rate of the clean water state revolving fund was 2.2 percent, while the average market interest rate was 4.8 percent. In this way, the clean water state revolving fund could cost 21 percent less. And it could provide all the funds needed for the project. The US State Drinking Water Revolving Fund also used low-interest loans (1.0 percent to 1.5 percent) and other paid use methods. The above-mentioned use of funds, such as low-interest or interest-free loans, were beneficial to the fund's value-added and the use of funds.

Cycle Rolling Mechanism Ensured Continuous Increase in Funds

Under normal circumstances, the environmental fund could make appropriate profit. The fund could be used to issue loans, buy and sell government bonds, and other financial instruments with good liquidity, including listed securities investment funds, stocks, corporate bonds with credit ratings above investment grade, financial bonds et al. For example, the US Clean Water State Revolving Fund initially received financial input from the federal and state governments. After the project received the proceeds, the repaid loans and interest were re-entered into the fund to support the new projects. This model promoted the multiplication of fund assets and ensured that the size of funds continues to increase.

Fund Asset Mortgage Guarantee Was Conducive to Inciting Social Capital Investment

The Clean Water State Working Capital Fund was established in 1987 in The United States. In order to expand the size of the funds, 27 of the 50 states that established the rolling fund issued mortgage-free bonds with the assets of the Clean Water State Revolving Fund as collateral. It raised another $20.6 billion in funding for the fund. The Polish Environmental Protection Fund also provided financing guarantees for the private environmental sector. The above-mentioned use of
funds secured by mortgage guarantees could attract social capital investment and produce better capital amplification effect.

**The Professional Services Provided by the Custodian Bank Helped To Improve the Level of Fund Management**

The US Clean Water State Revolving Fund and the US State Drinking Water Revolving Fund all adopted custodian bank management. The custodian bank was usually operated by an independent commercial bank. Its main responsibilities were that accepting commissions from the fund management department, responsible for asseting revenue and expenditure management, handling loans, settlement, and issuing government bonds. Relative to the environmental management department, the professional services provided by the custodian bank were conducive to improve the level of fund management.

**Research on Establishment of Drinking Water Source Environmental Protection Funds**

China's drinking water source environmental protection fund was oriented to the government-led capital injection, in order to mobilize the enthusiasm of the market for environmental protection, break through the bottleneck of corporate financing, and alleviate the lack of government financial resources. It aimed at giving full play to the role of the market in fundraising and achieving rolling value.

**Source of Funding Research**

At present, the source of funds for China's drinking water source protection fund mainly included three aspects drawing on the operating mechanism of domestic and foreign government guidance funds. First of all, in the initial stage of establishment of the drinking water source protection fund, the integration of some funds for special funds related to water and environmental protection should be considered. Because the development of this channel was relatively mature, and the sources of funds were stable. Secondly, in the initial stage of the establishment of the drinking water source protection fund, the state may request the local government to pay for the water quality guarantee for the cross-border section. For provinces whose water quality in cross-border sections was not up to standard, they could be withheld from the state-to-provincial general transfer payment through year-end settlement. The provinces that failed to pay the cross-border water quality guarantee on time were similarly deducted from the state-to-provincial general transfer payment by year-end settlement. The income from all withholding income would be included in the drinking water source protection fund. Thirdly, the social funds would also be a source of the drinking water source protection fund.

**Research on the Use of Funds**

China's drinking water source environmental protection fund should support projects mainly include sewage interception facilities, isolation facilities, protective facilities and identification facilities. Development and demonstration of drinking water source protection would also be an important support area. Including agricultural non-point source pollution control technology, water source protection and pollution prevention and control of high-tech and key technologies, advanced technology demonstration and promotion. The use of funds could be based on low-interest loans, financing guarantees, equity investments, subsidies, etc.

**Fund Management Research**

The drinking water source protection fund management organization should organize and manage according to the fund company model in the market economy. The core of its management model was to establish effective checks and balances and constraints among fund owners, managers and custodians.
Conclusion

Due to the limited financial resources of the government, a diversified fundraising strategy was needed. Establishing a fund was an important part of building a diversified investment and financing mechanism. In the early stage of the establishment of the guiding fund, it would be possible to give priority to cooperation with market-oriented fund operating institutions with certain capital scale and risk carrying capacity. The government could increase support for the fund, formulate preferential policies that could conducive to the development of the fund, and cultivate a group of institutional investors, and encourage various financial institutions to participate in the drinking water source protection fund.

The purpose of the establishment of the Drinking Water Source Protection Fund was to use government investment and policy to promote social investment, solve the problem of inadequate funding for local drinking water sources, and optimize resource allocation. In the case of some types of drinking water source protection, due to the large initial investment scale, long return period and high risk, individual investors and individual institutional investors were less involved. The guiding fund should focus on such projects, use funds reasonably, and strengthen the guiding role of the fund.

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