Evaluation System of Ningbo's Water-saving Society Construction under the Digital Economy

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Abstract. In response to the difficulties and problems in the construction of a water-saving society and the construction of a water-saving society in Ningbo in recent years, with rivers as the main canal, the digital economy water-saving society management model was innovatively proposed, and the evaluation index system for social construction was built in the water-saving society, combined with the connotation of the digital economy, a water-saving society evaluation method was put in Ningbo, and suggestions and countermeasures also referred.

1. Introduction
The concept of a water-saving society was first proposed in China in the Tenth Five-Year Plan[1]. In 2001, the state approved the establishment of the country's first water-saving society pilot, namely Zhangye City. Afterwards, the establishment of a water-saving society was added to the "Water Law". In 2014, the Ministry of Water Resources held a meeting on the preparation of the "13th Five-Year Plan" for water conservancy development. Building a water-saving society has become an important part of the "13th Five-Year" plan. The construction of a water-saving society is in full swing. In order to scientifically and comprehensively assess and evaluate the effectiveness of the construction of a water-saving society, scholars have also carried out research on the construction of a regional water-saving society, mainly in the establishment of indicator systems, evaluation methods and research. There are three aspects to the weight of indicators. Zhang Yi et al. (2017) first formulated a set of primary evaluation index system using frequency statistical method and theoretical analysis method, and then used the expert investigation method to analyze the initially formulated indicator elements (3 first-level indicators and 28 second-level indicators) Screen again[2]. Zhu Jie et al. (2019) used AHP-Fuzzy Comprehensive Evaluation (Analytic Hierarchy Process and Fuzzy Comprehensive Evaluation Method) through a large number of reading materials, and used Haikou as an example to establish an evaluation index system and build AHP for building a water-saving society[3]. Model to analyze the current level of water-saving society construction in Haikou City. These studies are of great significance to the construction of a water-saving society, but the current research is mainly aimed at the construction of regional cities. Each city selects different index systems for evaluation and research according to the characteristics of the region and the status quo of water resources[3-5]. There is a lack of universal evaluation models and complete evaluation indicators.

With the development of the Internet and the digital economy, new challenges have been raised for the construction of a water-saving society. The model of social construction is shifting from one-way management to two-way interaction, from offline to online and offline integration, and from pure government supervision to more emphasis on social collaborative management. These changes and development trends will guide the construction of a water-saving society in my country into a
"decentralized" new ecosystem with multi-stakeholder participation in collaborative management.

2. **Current status of water-saving society construction in Ningbo**

   The construction of a water-saving society has effectively promoted the transformation of economic development mode, realized the adjustment of water use structure, and greatly improved water use efficiency[6-8]. Although the construction of a water-saving society has achieved initial results, in the process of building a water-saving society, there are still some difficulties and problems in ideological and working methods, which hinder the development of a water-saving society. On the whole, the internal driving force for the construction of a water-saving society has not yet been fully formed, showed as fig.1.

![System design scheme](image)

First, the construction concept has not yet been fully implemented. Although governments at all levels and some social organizations have carried out various forms of water-saving publicity and education, and have achieved certain publicity effects, the public's awareness of water resources and water-saving awareness is a slow increase.

Second, the establishment of institutional mechanisms needs to be improved. The construction of a water-saving society requires the establishment of a series of laws, regulations, standards and policy systems to escort it. At present, my country's water-saving laws and regulations system is not perfect. Although it is proposed to "build a water-saving society" at the legal level, the formulation is relatively general, and there is no clear basic requirements such as who will build and how to build a water-saving society. Lack of adequate legal support.

Third, the channels for investment in construction funds are limited. The construction of a water-saving society, whether it is "soft water-saving" or "hard water-saving", or large-scale institutional changes, requires a large amount of capital investment. Investment channels can be divided into government financial investment and non-government investment. Non-government investment mainly includes self-raised funds by enterprises and the public. However, the current cost of water saving is generally much higher than the price of water taken, which results in the lack of
incentives for water saving, and the lack of incentives for companies and the public to save water.

Fourth, relying too much on government promotion From a practical point of view, the government currently bears the main responsibilities for the design and formulation of water-saving social system policies, planning implementation, and capital investment, and the government's leading role is obvious. In contrast, market regulation is not strong enough, and social organizations are not involved enough.

3. The evaluation system of Ningbo's water-saving society construction under the digital economy

The construction of a water-saving society is a systematic project. Starting from the significance of establishing a more scientific evaluation index system for the sustainable development strategy of Ningbo’s economy, it investigates the construction of a water-saving society in the construction area of Ningbo’s "Three Rivers and Six Tang Rivers" water system. Guided by the scientific theory of economic development, the development of a digital water-saving platform will enable multiple parties to release information, so that each subject has an equal opportunity to participate, focusing on the collaborative governance of platform governance, government governance, corporate governance, and user governance. Stakeholder coordination management mechanism and water saving system[9-10].

3.1. Analysis of the management model of a water-saving society in the digital economy

Theoretical analysis of the connotation, basic characteristics, new technologies and basic principles of management of the digital economy, puts forward the concepts and characteristics of the new real water economy and the new smart water economy of the digital economy environment, and develops digital water-saving platforms to enable governments, platforms, enterprises, Users and farmers can release information from multiple parties, forming a “decentralized”, “disintermediation” and “de-pyramid-style” management method, exploring the multi-stakeholder collaborative management mechanism and water-saving system based on this, and analyzing the digital economy Impact on the evaluation of a water-saving society, and propose a new model for the construction of a digital economy and a water-saving society.

3.2. Establish an evaluation index system for the construction of a water-saving society

According to the overall requirements and key actions of the National Water Conservation Action Plan, the water-saving systems of the nine construction areas with the "Three Rivers and Six Ponds" as the research object are proposed, and data dual control, agricultural water saving, industrial water saving, and urban water saving are selected. Water and key areas water-saving subsystem, science and technology innovation platform and comprehensive policy platform 7 are the first-level indicators, and 26 items such as total water consumption, water use intensity, water-saving target responsibility, and water-saving irrigation are second-level indicators. To build an evaluation index system for a water-saving society, use knowledge engineering methods to automatically obtain various index evaluation standards, and study index weight calculation methods based on extreme learning machines and gray theory.

3.3. Evaluation method of water-saving society based on artificial intelligence algorithm

Investigate and obtain water-saving index data sets of the nine construction areas, adopt a comprehensive evaluation method based on neural networks, support vector machines and extreme learning algorithms to evaluate the construction of water-saving societies in the nine construction areas, and determine the most Optimal evaluation models and methods, and adjust the secondary indicators of the model.

3.4. Cross-empirical analysis of the construction research area

Data screening and sorting of water-saving index data in the study area will be carried out, and
evaluation methods for the construction areas of Yongjiang, Fenghua, Yao, Qiantang, Zhongtang, Houtang, Nantang, Zhongtang, and Xitang Rivers will be carried out Cross-validation analysis, and determine the evaluation model and method, and select typical construction points to carry out empirical analysis, feedback and update and adjust the construction mode.

4. Countermeasures and suggestions for building a water-saving society

In response to the difficulties and problems in the construction of a water-saving society and the construction of a water-saving society in Ningbo in recent years, combined with the connotation of the digital economy, the river system is used as the "main canal" to innovatively propose a management model for the digital economy and water-saving society. To build an evaluation index system for the construction of a water-saving society, focusing on several key points.

4.1. Taking the river system as the research object can expand the research space-time distribution of the water-saving society construction area

At present, most of the domestic research on the construction of water-saving society is based on administrative regions. There are differences in the development and utilization of water resources, management status, problems to be faced, and the focus of water-saving society construction between regions. This subject takes river water systems as the research object, constructs evaluation index systems and methods, provides a scientific basis for the construction of inland river basin construction areas and water-saving society construction, and is conducive to promoting the development of water-saving society practice work across the country.

4.2. Leveraging on the digital platform to achieve "decentralized" water-saving management and construction from the perspective of digital economy

The development of science and technology at any time, with "artificial intelligence + big data + cloud platform" as the technical support, explore the "decentralization", "disintermediation" and "de-pyramid" management structure, and build a multi-stakeholder participation ecological system allows each subject to have equal opportunities to participate, pays attention to the coordinated governance of platform governance, government governance, and user governance, completes water-saving society construction indicators and evaluation models and calculations, and provides social governance methods under China's digital economy Reference ideas.

5. Conclusion

The construction of a water-saving society is a systematic project. Starting from the significance of establishing a more scientific evaluation index system for the sustainable development strategy of Ningbo’s economy, it investigates the construction of a water-saving society in the construction area of Ningbo’s "Three Rivers and Six Tang Rivers" water system. Guided by the scientific theory of economic development, the development of a digital water-saving platform will allow multiple parties to release information, so that each subject has an equal opportunity to participate, focusing on the collaborative governance of platform governance, government governance, corporate governance, and user governance. Stakeholders coordinate the management mechanism and water-saving system, and then propose a new model for the construction of a water-saving society in the digital economy. Comparing the overall requirements and key actions of the National Water Conservation Action Plan, focusing on research and experimentation on water-saving indicator data in nine construction areas, screening indicators at all levels based on artificial intelligence methods, and exploring the construction of water-saving society construction evaluation indicators system. A knowledge engineering method is formed to automatically obtain various index evaluation standards, and an index weight calculation method based on intelligent algorithms is obtained. Finally, we use this method to study water-saving society evaluation methods based on artificial intelligence algorithms, carry out cross-empirical analysis of research areas, and determine the best evaluation model and method for each construction area to complete the construction of water-saving society.
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