Discussion on the Demand Management of Water Resources

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Abstract

Scientific and rational and efficient water demand management of water resources management system reform in China is an important program and innovation, though analysis of the concepts, methods, measures and content of the research and implementation of water demand management explore the smallest, most cost effective and integrated resource planning principles into the description of water demand management, to strengthen water demand management, control demand growth will help to meet the water demand and supply with the sustainable use of water resources.

1. Introduction

In the light of rigid constraints of insufficient water supply conditions, following the principle of "need for the set", integrated use of administrative, institutional, economic, and policy and other management tools to regulate behavior of human resources utilization inhibit, it needs to realize the excessive growth of water demand and to achieve optimal allocation of limited water resources and sustainable use. In view of Chinese severe water crisis, water demand management is an effective solution. It allows people’s knowledge to turn from the traditional ideas which water resource is the "public good" to become a "financial product".

2. The Concept of Water Demand Management Mechanism

During the management of water resources allocation decisions, considering the water quantity that owners of water resources could provide, through government policies and regulations, economic leverage, engineering measures and normal water use assurance, it reaches to cut expenditure target, and turns the savings of water into disposable consumable water.

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The essence of water demand management is to provide the proposed method to solve water problem from water users, its perspective focuses on water consumption behavior of water users. Through the effort of the water supply, water plant and social intermediary organizations, water users and other collaborative improve end-use efficiency and change water use patterns to meet the same functionality while reducing water consumption and water demand in this way, guidance and suggestions are given to solve problems, but also makes the water demand management include water resources management sweep all levels, and can address the various issues facing the region-specific solutions.

3. Target of Water Demand Management Mechanism

The goal of demand management is to take water as an economic resource or commodity, for the purpose of improving water efficiency and wanting people to find a balance between water supply and demand. The main purpose has three aspects.

- Urge national economy industrial sectors and water resources to realize optimal recombination in the structure, quantity and spatial distribution.
- Set and guide the water users of water resources, rational consumer behavior and consumption patterns to reduce water demand and achieve the purpose of reducing revenue costs.
- Encourage using advanced water saving technology equipment and advanced sewage treatment technologies and facilities, which makes the water sector and water users share water conservation and water re-use benefits.

4. Approach of Water Demand Management

- Relevant laws and regulations must be introduced, we should transform water resources management to river basin management, separate administrative region or run separate management systems, definite the right to water basin management committee dominance, and enable environmental assessment indicators to assessing the ecological maintenance of regional governments evaluation index system, improve the ecological system of accountability. A legal measure is a coercive step to manage all urban water affairs. On the one hand, water demand management depends on the laws and regulations, water resources exploitation and protection is regulated in the form of legal, on the other hand we must enforce the law strictly, in other words, the laws are existed and must be observed So far, a lot of work has been done in terms of legislation, however, the legislation for water demand management is still not comprehensive enough and perfect. And the systematic and scientific rationality of existing laws and regulations need to be tested and further modifications, enrich and improve by the law enforcement practice.
- Rationalize water use of the market price and implement the ladder price, through leverage measures,. and the use of a market economy, in order to form a economic regulation and control through the use of market instruments, it is necessary to form a strong and effective restraint and incentive mechanisms to promote the value of compensation, water user forms the awareness of conservation in the production and life. Water demand management incentives primarily adopt peak and valley time price and water-saving incentives two means to achieve efficient water-saving applications, ultimately realize the goal that optimal allocation of water resources efficient utilization and sustainable social and economic development goal of the whole community.
- It is necessary to improve the level of science and technology of water resources management, involving information technology, simulation, optimization, decision-making technology and monitoring technology based on the systems theory, the letter information theory, which is the key of the level of technology to improve water resources management.
- By means of increased propaganda of water demand management, users are awareness of the benefits to themselves, so they can take the initiative to change, water efficiency would be promoted and water
demand would be reduced. Water authority and the environmental protection departments have the power to propagate through Syndication, organizing campaigns to make demand management policy enjoy popular support (Fig. 1).

![Implementation mechanism of water demand management](image)

5. Content of Water Resources Demand

5.1. The content of agricultural water demand management

Develop greenhouse agriculture and dry farming, change crop planting habit, construct various irrigation projects and take effective measures to apply irrigation, soil water-saving technology transformation draw up appropriate agricultural programs, scientific irrigation. Take full use of all water resources, such as rainwater. Mobilize farmers’ enthusiasm to construct rainwater harvesting projects.

5.2. The content of domestic water demand management

Water rationing should be planned, seasonal price and price ladder should be implemented according to the characteristics of the city formulating policies and encourage households to use water-saving devices to replace the supporting.

Accelerate the technological transformation of urban water supply networks; reduce leakage in water transmission and distribution. Increase the urban sewage treatment and recycling efforts.

5.3. The content of industrial water demand management

Enterprises should plan for water and implement ladder price to promote optimal allocation of water resources. Popularize urban water conservation equipment, and accelerate the technological transformation of urban water supply networks, centralize sewage treatment, though these measures water use efficiency could improve the industrial water recycling rate, eliminate the process water consumption, implement the national industry water management system strictly, and play in the water reuse market.
5.4. The content of Eco-green water demand management

Choice green type reasonably, improve the efficiency of irrigation water, urban greening, and use recycled water and rainwater irrigation technology actively. With the city water system pipe network construction, medium and large squares, gardens and green space should maximize the use of water for irrigation, it will reduce the volume of urban ecological green fresh water. According to the area that are not conducive to the laying of the pipe network, rainwater collection systems can be built underground, it can also use artificial ground water features, ponds for water harvesting and irrigation. This measure can save the environment 80% water of fresh water.

6. Conclusion

- Water demand management is not only an effective system engineering on different industries, different companies, different departments, but also is the future trend, If it could be promoted and used, enormous economic, social and environmental benefits can be brought. Water administrators and water users, water operators need to participate the action, especially those who need water to mobilize the whole society to participate in the implementation policy by guidance, administrative and economic incentives to achieve the formation of long-term mechanism step.

- We should learn to grasp and use new opportunities brought by current socio-economic and technological development, promote water demand management actively. Water demand management alleviates the current contradiction between water supply and demand effectively, and provides a good reference to address water use with low efficiency and the water crisis. Therefore, it should be promoted vigorously.

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References


