UDC 338.49+332.021.8

CHINESE GOVERNMENT'S ENVIRONMENTAL MANAGEMENT IN SPONGE CITY CONSTRUCTION UNDER THE DIGITAL BACKGROUND: PROBLEMS AND COUNTERMEASURES

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With the rapid development of urbanization, continuous high-intensity development has made the urban ecological environment overwhelmed. In order to solve this problem, after fully studying the relevant knowledge of foreign sponge cities, China has carried out relevant pilot work according to the current situation of the city taking into consideration local conditions. In the context of digital-driven government management, the construction of sponge cities requires more comprehensive and accurate urban planning, so as to complete the cooperation of various stakeholders at different levels. The article mainly discusses the potential problems and countermeasures faced by the construction of sponge cities, provides decision-making support and theoretical suggestions for the construction of future smart ecological environment cities, inspired by environmental governance research.

1. Reasons and Present Situation of Sponge City Construction in China

1.1. Reasons for Sponge City Construction in China

In the past 30 years, China's urbanization has played a vital role in promoting economic and social modernization. However, due to the extensive urban development model, "urban diseases" are very prominent, resulting in a series of serious resource and environmental problems. It is mainly manifested in three aspects. First, the pattern and micro-topography of rivers and lakes have changed in the process of urbanization, the regulation and storage capacity of rivers and lakes has decreased, and urban floods have occurred frequently. Second, the discharge load of urban pollutants has exceeded the carrying capacity of rivers and lakes, resulting in the deterioration of the water environment and water ecology, and aggravating the shortage of water resources. Third, the pressure in water supply and demand has become increasingly obvious, and the shortage of urban water resources is widespread. More than 400 cities in China are short of water [1, p.793]. These three aspects of urban water problems are intertwined, which have become prominent problems affecting urban public safety and human settlement environment, and seriously restrict the sustainable development of Chinese cities.

At present, China's urban construction is basically extensive, and rivers, lakes, and green spaces around the city are buried to build houses, or roads and parking lots are built on the hardened ground, so the original natural ecological environment and water system of the city cannot be protected. After the urban ground hardening construction, the water that can seep into the ground when it rains, especially when it rains heavily, gathers on the ground to form surface runoff, resulting in urban waterlogging. Rainwater can't be used effectively, which leads to the problem of "water logging in every heavy rain and overflowing with every small rain" in many cities across the country. Urban construction pays no attention to the protection of natural water ecology, the utilization of natural water resources, the treatment of water pollution, and the guarantee of water safety. Urban construction pays less attention to underground drainage and water absorption system and attaches importance to hardening and lighting facilities on the ground. The urban drainage system has a single goal, low standard, lack of systematic consideration, and lack of response to natural disasters. Urban waterlogging, water pollution, and other issues cross, which are common problems with current urban construction, reflecting the importance and urgency of sponge city construction.

1.2 The current situation of Chinese government building sponge city

To solve these problems, the Chinese government has carried out relevant pilot work according to the current situation of cities and local conditions. In the context of digital-driven government governance, the construction of sponge city needs more comprehensive and accurate urban planning, so as to complete the cooperation of various stakeholders at different levels.

In November 2014, the Ministry of Housing and Urban-Rural Development issued «the Guide to Sponge City Construction - Low Impact Development System» [5]. In January 2015, the Ministry of Finance, the Ministry of Water Resources and the Ministry of Housing and Urban-Rural Development jointly organized the construction of 16 pilot cities. In October 2015, the Office of the State Council issued «the Guiding Opinions on Promoting the Construction of Sponge City» [4], which clearly pointed out the objectives of sponge city construction. After 2015, 30 cities in China have carried out sponge city pilot work, so as to explore the way to promote sponge city and accumulate construction experience. At the same time, based on the construction of national pilot cities, many provinces also put forward the appeal of building provincial pilot cities of sponge cities, which vigorously promoted the promotion and application of the concept of sponge city in construction projects around the country. In the process of sponge

city planning, practice, evaluation, and operation, its construction concept, technical reform, and evaluation standard are also constantly changing with the development of The Times. The newly released White Paper on the Construction of Sponge Cities in China 2018 puts forward the idea of accelerating the construction of "Sponge Cities in China", and points out the road to building intelligent sponge cities digitally in the future.

2. The basic connotation of sponge city

Sponge city refers to a city that, like a sponge, has good "elasticity" in adapting to environmental changes and cop with natural disasters. When it rains, it absorbs, stores, seepages and purifies water, and "releases" the stored water and makes use of it when needed [2, p.82].

To build a sponge city is to make the city retain rainwater to the greatest extent, and set up a number of plots as sponges in various areas of the city. These sponges are usually leisure parks for citizens, and they become water storage places when there is heavy rain. Mud, grassland, forest, small rivers, lakes, sewers, reservoirs, etc. can absorb a lot of rainwater. In this way, the rainwater can be digested locally, so as to prevent the rainwater from pooling together to form a flood of a rainstorm. When a large amount of rainwater is absorbed by the sponge, there is no accumulated water and no water logging in the city. The rainwater fully absorbed by sponge can be widely used again, such as watering flowers and plants, washing cars, flushing toilets, etc, which can alleviate the shortage of water resources to a certain extent.

Sponge city requires the protection and utilization of natural rivers and lakes, the reduction of reinforced concrete drainage pipes and reinforced concrete reservoirs as much as possible, the combination of drainage facilities with existing urban green spaces, gardens, and landscape water bodies, and the solution to the problem of water pollution caused by sewage overflow from urban sewage drains and toilets after a rainstorm. From an economic point of view, the construction of a sponge city, firstly, reduces the cost of urban construction, secondly, reduces a series of economic losses caused by water logging, and thirdly, exerts the ecological benefits of the city. The schematic diagram of a sponge city is shown in Fig. 1.

Fig. 1. – The schematic diagram of sponge city [2, p.92]

The construction of an intelligent sponge city requires that in the context of digital-driven governance, the concept of government governance should be innovated and a new concept of digital governance should be added. At the same time, intelligent city governance is carried out. Through the use of intelligent big data information analysis and other information technologies, a business monitoring cloud platform is built to improve the intelligent perception level of urban rainwater resource status, promote data sharing and social participation, and realize the intelligent construction, operation, and maintenance supervision of sponge city. This will provide new ideas about solving the problems that hinder the process of present, and is also the only way for the construction of sponge cities in the future [3, p.89].

3. Problems with the construction of sponge city by the Chinese government

3.1. Segmentation of management system, the government actively promotes the construction of information platform, and realizes the sharing of complete information and data by various subjects, thus completing the optimal allocation of resources. The government plays a leading role in the information sharing platform, manages the relationship to all subjects in an overall way, coordinates the rights and interests of all parties, and provides firm policy supported for the digital management of Sponge City.

3.2. The concept of understanding is not in place, planning and construction time and space fragmentation. First, the application and service are low. Sponge city construction is an ecologically sustainable project. In sponge city construction, some cities pay too much attention to the early infrastructure construction but neglect the maintenance and supervision in the operation process, and the actual efficiency is far from satisfying. Secondly, the construction mode is fragmented, and extensive urban water conservancy construction still exists. For example, the work in some cities is not in place, which is only a shallow analysis of policies and simply imitates the paradigms of other pilot cities.

3.3. The concept of sponge city has not been popularized, and the social participation rate is low. Because of the lack of knowledge reserve for reusing rainwater, people did not support the construction of sponge city where their hometown is located. There are a distance and barriers between government policies and the masses, which leads to the government's work not being supported by the masses.

3.4. The construction concept is backward, and the trend of intelligent digital governance has not been followed up in time. The concept of sponge city was put forward before the big data development strategy. Sponge city projects in many cities still stay in the traditional fragmented and mechanical construction mode, and the operation and maintenance supervision of construction facilities and the effective solution of water problems such as urban water logging was not discussed.

4. Suggestions of the Chinese government to build sponge city from the perspective of digital governance

The construction of an intelligent sponge city requires that the concept of government governance should be innovated and the new concept of digital governance should be added in the context of digital-driven government governance. At the same time, intelligent urban governance will be carried out, and a business monitoring cloud platform will be built through the use of intelligent big data information analysis and other information technologies to improve the intelligent perception level of urban rainwater resources, promote data sharing and social participation, and realize the intelligent construction and operation and maintenance supervision of sponge cities. This will provide new ideas about solving the problems that hinder the process of the present, and it is also the only way to build a sponge city in the future.

4.1. Build an intelligent government decision-making system

First, constructing a data collection scheme based on the regional geographical knowledge which accords with the regional characteristics and advantages and disadvantages, and constructing an efficient and real-time operation system, so as to provide a solid data foundation for the sponge city construction under the guidance of digital governance background.

Secondly, exploring the new development of environmental data in the era of big data. On the basis of existing data, promote the central role of the government in the process of sponge city construction by improving information processing technology, establishing a new concept of data information analysis, and broadening the sources of information data, and promote the intelligent decision-making of government decision-making system and the integration of comprehensive and accurate analysis data.

4.2. Multi-subject governance of the micro-level

1) At the government level, the government should constantly improve the level of administrative intelligence, so as to change into the digital governance model; actively promote the construction of information platforms, realize the sharing of complete information and data by various subjects, and complete the optimal allocation of resources; take the leading position in the information-sharing platform, manage the relationship to all subjects as a whole, coordinate the rights and interests of all parties, and provide solid policy supported for the digital management of Sponge City.

2) At the enterprise level, it is necessary to give full play to the strengths of the enterprise, provide accurate information on the government, and coordinate the cooperation between government and enterprises, so that the information platform led by the government has a more perfect information support system. At the same time, different enterprises should not only have healthy competition but also need to cooperate with each other to complement each other. In the digital platform, it is possible to realize benign interaction between government enterprises and enterprises and jointly promote the harmonious development of sponge city.

3) At the level of social organizations, social organizations should actively participate in the social governance of sponge cities, and provide more social support for the reform of government governance. Actively participate in the construction of information and data sharing channels, and further promote the digital governance of sponge cities.

4) At the citizen level, citizens should take the initiative to participate in the social construction of sponge city, be good at finding and raising problems, and actively report and solve problems. By participating in social organizations and other forms, we can promote more positive social energy and help the further construction and development of sponge cities.

4.3. Application of digital governance model

The relevant data onto regions are managed by the local governments where each region is located, and the non-circulation of information about local governments greatly limits the integrity of sponge city construction. Therefore, relevant departments should increase relevant investment, promote information sharing, and build an information exchange and interactive platform to ensure the right to know of all parties, thereby reducing negotiation costs and improving the efficiency of sponge city construction.

First of all, the construction of a real-time ecological environment monitoring system will help each subject to grasp the environmental data in time and accurately, and provide authoritative information data onto the government to judge the ecological environment situation scientifically and reasonably;

Secondly, in the construction process, it is necessary to ensure the accuracy and effectiveness of the construction and transformation areas, and make timely adjustments or stop operations when the measures are not obvious or inappropriate, so as to avoid useless measures. Finally, attention should be paid to the operation and maintenance after the project is completed, and depreciation facilities should be replaced in time to ensure the construction effect and prevent the ecological environment from being damaged again.

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