

Analysis of Water Conservancy Policy in Zhejiang Province, China

-- Total of Five Water Treatment --

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Abstract: This paper aims to judge the prospect of waterside landscape construction in Zhejiang Province, by analyzing current situation of water related issues and grasping key points of corresponding strategy called total of five water treatment. The background, structure and principal measures and mechanism of this strategies was clearly clarified. Our results show that this policy is essentially focusing on three issues -- water qualities and water quantity and water disasters, namely no evident indication that the construction of waterside landscape would boom in Zhejiang Province before 2020.

1. Introduction

The policy called *Total of Five Water Treatment* was released by Zhejiang Province Government on November 29th, 2013, as the supreme strategy by 2020 for solving its water problems. ^[1] Zhejiang Province, locates in Eastern coast of the People's Republic of China as showed in *Figure 1*, and has a population of 55.1 million at the end of 2014, among whom 64.9% belongs to urban population. ^[2] It lies just south of the Yangtze Delta, with a land surface area of 0.1 million km², 70.4% covered by hills and mountains, 23.2% of plains and basins, and 6.4% of rivers and lakes. Its terrain is higher in the southwest and lower in the northeast.



Figure 1. Map of Zhejiang Province ^[3, 4]

2. Current Situation of Water in Zhejiang Province

Its water quality is relatively good in upper reaches, lakes and reservoirs; however, opposite in those reaches at downstream plain areas and urban areas, with organic pollution as a main cause. ^[5] The reaching standard quality for domestic water accounts for 85.0% among those centralized sources above county level. Besides, the urban sewage treatment rate accounts for 89.8%. ^[6] Regularly,

flash floods tend to strike the upstream because of large stream gradient and waterlogging frequently occur in the downstream as its low-lying and flat landform. Due to its harsh natural conditions including the uneven distribution of rainfall, a rapid economic growth as well, considerable floods and waterlogging occurred 81 times from 1949 to 2012, average 1.3 times per year. ^[5] In 2014, its annual per capita water resources are merely 2052.8 m³, on the other side, its water resources utilization rate is only 19.5%. Most of water deficit happen in Hangjiahu Plain, usually caused by poor quality. ^[7] *Table 1* followed shows the water deficit under three patterns of probabilities of water supply.

Table 1. Water Deficit in Zhejiang Province ^[8]

| Probability of Water Supply | 50% | 75% | 90% |
|---|-----|-----|-----|
| Water Deficit (Billion m ³) | 11 | 18 | 38 |

3. The Policy of *Total of Five Water Treatment*

This policy highlights the treatment of wastewater and flood management, and planned 3 phases and set a final goal that achieve a qualitative level change by 2020. Its planned routine is taking the water quality as an index to force the industry transformation and update.

Based on existed data and literature review, its structure and principal measures were summarized in priority order in *Figure 2* next page. We found that though the five treatment separates distinctly, they still involve intensively. Noteworthy is that:

(1) The activities of reutilization of recycled water from wastewater contribute to reduce water supply and achieve water saving in some cases. Besides, water saving enables less wastewater production and water supply as a result of less water consumption.

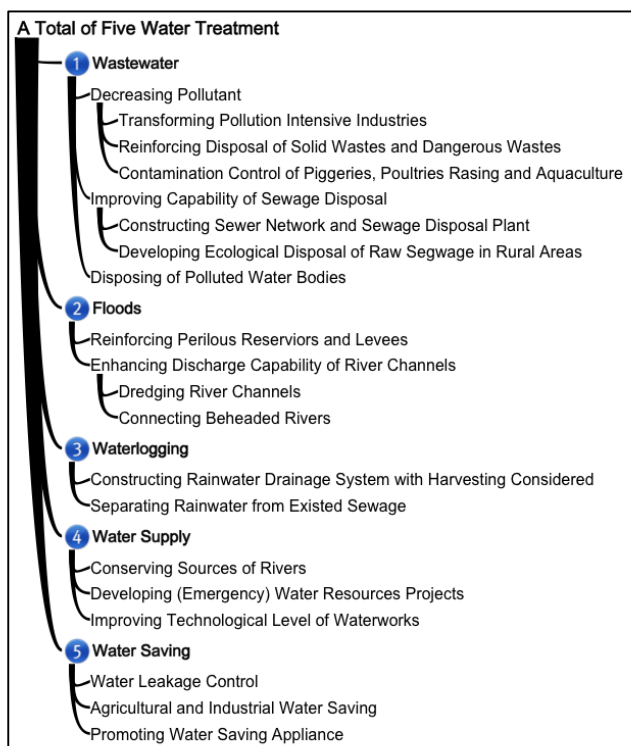


Figure 2. Outline of Total of Five Water Treatment^[1, 7, 9]

(2) Dredging water bodies conduce to not only management of floods and waterlogging by upgrading the discharge capability, but also disposing of polluted water bodies in some degree. So does connecting beheaded rivers.

(3) Separating rainwater from sewage will alleviate wastewater disposal as rainwater can be drained to water bodies directly without any segment disposal. Moreover, utilization of collected rainwater also relief the intensity of water supply and draining, meanwhile achieve water saving.

(4) Less water supply leads less wastewater, promotion of water saving and vested versa. And decreasing pollutant, improving capability of sewage disposal system and relieving polluted water bodies can also facilitate water supply, by making it easier to conserve sources of rivers, develop water resources projects and process water at waterworks.

4. Conclusions

It can be essentially concluded that the treatment of wastewater is mainly for improving water quality; the treatment of floods and waterlogging is mainly for the management of water disasters; and the treatment of water supply and saving is mainly for enlarging water quantity.

As the sewage disposal system as well as rainwater collection and drainage system, reservoirs, dredging of

water bodies and connecting beheaded rivers have multiple functions, thus they should be more enhanced and persisted as efficient measures. Besides, leakage control of water supply and should be reinforced. In addition, a mature and broad financing system consists of both fiscal expenditure and private capitals need to be established in the future.

In conclusion, this study indicates that in Zhejiang Province, or even in a larger scale of China, the construction of waterside landscape would not boom by 2020 since it is inferior to other basic tasks at present and in the near future.

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