Collaborative legislation on the control of toxic and harmful substances in drinking water resources of Yangtze River Delta

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Abstract. With the determination of China's Yangtze River Delta integration development strategy, the importance of cross regional drinking water resources protection has become increasingly prominent. At present, there are still many problems in the practice of legislative collaborative protection. In this paper, the Yangtze River Delta as a flora, through the analysis of the current water quality of the mainstream and lakes in the middle and lower reaches of the Yangtze River, on the basis of listing the cross regional water resources collaborative protection, find out the needs of legislative coordination, and further clarify the mechanism, mode selection, process and way of regional legislative cooperation in the Yangtze River Delta. This study is of great significance to promote the rational allocation and sharing of water resources and improve the quality of regional comprehensive development.

1. Introduction
Cross-regional drinking water resources protection is the key and priority of environmental protection legislation. It is necessary to break through the limitations of traditional local legislative thinking and mode, and truly realize cross-regional unified protection through legislative collaborative protection.

The safety of drinking water in the Yangtze River Delta region is related to the integrated and high-quality development of Yangtze River Delta and needs to be further improved in the regional legislative cooperation mechanism, and mode selection, procedures as well as approaches to the legislative cooperation [1].

For this reason, the Yangtze River Delta Region should base itself on the cross regional drinking water resources collaborative protection, focus on issues of common concern, find out the demand for legislative coordination, and promote the safety and sharing of water resources in the entire delta region through legislative collaborative protection.

2. Materials and methods

2.1. Study area of the water quality
This study take Dingshan Lake, a provincial lake in the lower reaches of the Yangtze River as a representative, the data of its water quality from 2008–2018 were obtained and analized.
2.2. Analysis of current problems
This paper analyzes the existing problems from the perspective of national and regional legislation, combined with the current situation of water resources and environmental protection law.

3. Results

3.1. The water quality of this area
In recent years, the concentrations of total nitrogen and total phosphorus in the Yangtze River mainstream have remained high. In particular, the water source of Taihu Lake has the pollution characteristics of high algae, high organic matter, high ammonia nitrogen, high odor and algal toxins [2]. Lakes and drinking water sources in the lower reaches of the Yangtze River are eutrophic polluted with total phosphorus and total nitrogen as the main pollutants. There are the impact of industrial pollution, the massive discharge of the surrounding agricultural and domestic sewage, and the impact of aquaculture. Inter-provincial lakes such as Dianshan Lake and Jinze Reservoir are important drinking water sources in Shanghai [3]. The upstream water is the leading factor affecting its water quality. The water quality and quantity are important to the safety of drinking water sources in Shanghai.

Taking Dianshan Lake as an example, studies have pointed out that although the water quality of Dianshan Lake is getting better, it still maintains a mild eutrophication level [4]. From 1998 to 2018 (Table 1), the TLI value of Dianshan Lake was between 50 and 65. The water quality is generally safe, but there are still hidden dangers that affect health. It should be noted that the economic prosperity of the Yangtze River Delta has also been accompanied by negative results of water pollution. Enterprises, factories, and population along the River are dense, with industrial and agricultural wastewater and domestic sewage continue to be discharged into downstream waters. The inorganic nitrogen, active phosphate, mercury, chromium and other elements in the water source exceeds the standard, which poses a great threat to drinking water.

| Time  | Comprehensive pollution index | Trophic state index |
|-------|------------------------------|---------------------|
| 2008  | Moderate Pollution 1.55 ~ 2.18 | Eutrophic (>50)     |
| 2010  | Moderate Pollution 1.55 ~ 2.18 | Mesotrophic (30-50) |
| 2012  | Mild Pollution 1~1.55        | Mesotrophic (30-50) |
| 2014  | Mild Pollution 1~1.55        | Mesotrophic (30-50) |
| 2016  | Mild Pollution 1~1.55        | Mesotrophic (30-50) |
| 2018  | Mild Pollution 1~1.55        | Mesotrophic (30-50) |

According to statistical data, the comprehensive pollution index of Dianshan Lake has shown a downward trend in the past 10 years, and the trophic state index has also declined year by year, indicating that the overall water quality of Dianshan Lake has been improving [5]. The water quality of Dianshan Lake from 2008 to 2011 was moderate pollution, and from 2016 to 2017 was mild pollution. In 2008, the trophic state index was 52.3, showing eutrophic state, and the trophic state index of 2009-2017 was 49.8-44.7, showing mesotrophic state. However, according to the monitoring situation in 2019, among the 70 monitoring points located in the 41 major rivers, lakes and other specific functional areas in Shanghai, the water quality of 9 monitoring points was worse than the Class V standard, showing a deteriorating trend, especially the two monitoring points, Jishuigang Bridge and No. 4 Navigation Mark, of Dianshan Lake are inferior to the Class V standard, which need to be pay urgent attention to [6].

3.2. Current problems on environmental protection
After the Yangtze River Delta integration development strategy was determined as the national strategy, water resources and other environmental protection problems are considered to be the focus and priority of legislation. The three provinces have carried out legislative cooperation on cross-regional environmental governance issues. Regional environmental protection legislation has been changed from
system design to specific implementation stage, but there are still many problems that need to be broken through and resolved.

A review of the laws of drinking water source protection shows that there is an obvious phenomenon of "fragmentation". First of all, in terms of national legislation, the *Environmental Protection Law of People’s Republic of China* is the basic law of environmental resources protection. The *Water Law of People’s Republic of China*, the *Law of People’s Republic of China on Prevention and Control of Water Pollution*, the *Law of People’s Republic of China on Flood Control* and other laws and regulations have legal provisions for the protection of drinking water source, but these laws and regulations are not uniform. From the perspective of coordinated control of water pollution in the Yangtze River Delta, in terms of macro-legislative planning, the central legislation still lacks a unified regulation of transboundary water pollution prevention and control in the Yangtze River Delta. The existing laws and regulations are not closely connected, the legal layout is not perfect and the scope and object of regulation cannot be complementary to each other, so there is a legal lacuna. Secondly, in terms of local legislation, the provinces of the Yangtze River Delta have local laws and regulations on water resources protection, but due to lack of coordination, they cannot come to coherence in terms of supervision and management, transboundary drinking water source protection zone delineation standards, transboundary drinking water source monitoring and information disclosure, etc. There is still no consensus on important provisions concerning the coordinated development of regions. These laws and regulations lack specific provisions for the protection of transboundary drinking water source, which makes this work difficult and insufficient, and hidden dangers to the safety of water source are gradually emerging.

Of the legislative process, the provinces of the Yangtze River Delta do not have a unified legislative plan. Besides, the legislative time gap is large, and the legislative mode is relatively loose. *The Regulation on Protection of Drinking Water Resources in Shanghai*, *The Regulation on Protection of Drinking Water Drinking Water Resources in Zhejiang*, *The Regulation on Protection of Drinking Water Drinking Water Resources in Anhui* were enforced in 2010, 2011 and 2016 respectively, and Jiangsu Province modified *the Decision on Strengthening the Protection of Drink Water Source* in 2019. During this period, *the Environmental Protection Law of People’s Republic of China* and the *Law of People’s Republic of China on Prevention and Control of Water Pollution* were revised successively. The water pollution prevention and control legislation of various provinces in legislative plan, legislative progress, and legislative time is not synchronized and consistent. Without a consensus on before the legislation and any other specific modes of legislative coordination, which is not compatible with the demand to solve the common regional environmental problem of water pollution. The collaborative legislation approach of soliciting opinions from other places in the legislative process did not have substantial results. Secondly, from the perspective of rules and regulations, there is no coordination and consistency between the legislation of various provinces and the higher level law. This leads to conflicts, gaps and inconsistencies among the laws and regulations in terms of legislative structure, legislative purposes, legislative principles, and specific legal responsibilities. Besides, in terms of basic principles and requirements for joint prevention and control of water pollution, there are also situations that the higher level law has not been specifically refined, even failed to reflect. Finally, there is no consistency in the legislative structure, legislative purpose, legislative principle and other guiding rules, as well as the water pollution early warning and emergency mechanism, the responsible subject of scientific research cooperation, the penalties of environmental legal liabilities, and other specific rules.

The current legislative coordination of drinking water resources protection in the Yangtze River Delta is still in the initial stage, which is mainly based on local conditions without consideration of the environmental integrity and mobility. It is urgent to overcome the regionalism and fragmentation of administration, formulate a unified assessment system and indicators on the basis of legislative coordination, so as to facilitate the indicator-oriented legislative work in the Yangtze River Delta Region. At present, the legislation of drinking water resources protection in the Yangtze River Delta has not achieved substantial coordination. During the critical period of the comprehensive development of legislation in the Yangtze River Delta region, it is necessary to establish a unified assessment system and indicators to promote continuous development and post-legislative assessment, for the purpose of
summarizing experience from practice and providing reference and guidance for the development and improvement of legislation. This is also an important means to improve the quality of legislation, so as to force the development of local legislation, promote the improvement of regional legislation coordination, and ultimately promote the Yangtze River Delta regional drinking water resources protection legislation from formal coordination to substantial coordination.

4. Discussion

After the Yangtze River Delta integration development strategy was determined as the national strategy, the legislative coordination of drinking water resources protection needs to break through the limitations of traditional local legislative thinking and mode, and be further improved in the regional legislative cooperation mechanism, and mode selection, procedures as well as approaches to the legislative cooperation.

The Agreement on Deepening Coordination of Local Legislative Work of the Standing Committee of the People's Congress in the Yangtze River Delta Region clarifies that the provinces of the Yangtze River Delta will mainly promote the planning, drafting, advancement and achievements sharing of legislative cooperation. The Regulation on environmental protection in Shanghai and the Provisions on Water Resources Management in Shanghai are also cleared that establish a coordinated protection mechanism for the ecological environment of key areas and watershed in the Yangtze River Delta with relevant provinces. Therefore, the establishment of transboundary drinking water source protection cooperation mechanism should focus on three points.

Firstly, it is necessary to specially study on the related matters of legislative coordination, as well as negotiate and deploy the phased targets and main tasks. From the holistic perspective of coordinating water environmental protection planning, in order to promote the institutionalization of the water source protection cooperation mechanism in the Yangtze River Delta region, the power and responsibility of water source ecological environment supervision and management, and the legal nature and status of the government joint conference system should be made clear.

Secondly, it is necessary to base on local legislative competence and carry out cooperation and co-construction and sharing on the basis of maintaining the unity of the legal system. We should focus on the common demands of the Yangtze River Delta in industrial upgrading, water sharing and other benefits and development, and jointly maintain the safety of drinking water resources.

Thirdly, through multi-party coordination, strengthen the communication and consultation between the People's Congress legislative plan and the annual legislative plan, inform each other of the relevant preparations and solicit opinions from each other, as well as prioritize the promotion of legislative projects for the drinking water resources protection in the Yangtze River Delta and strengthen collaboration.

5. Conclusion

The Control of Toxic and harmful substances in Drinking Water Resources of Yangtze River Delta is an important legislative project related to the integrated development of the Yangtze River Delta and the health and safety of the people in the watershed. Legislative coordination aims to address the publicity, mobility and integrity of environmental problems, with cross-regional environmental governance as the goal, and focuses on the legislative guarantee and institutional supply in key fields of integrated and high-quality development in the Yangtze River Delta region. In the aspects of legislative mode, institutional content and implementation, it is emphasized to break down the administrative and interest barriers of the three places and realize the coordination and integration of regional environmental rule. In this process, it is necessary to give full play to the active role of local legislative organization and coordination, strengthen the joint construction, common protection and shared governance of the regional ecological environment, with equal emphasis on source prevention and control and end-of-pipe treatment. It should be noted that not only pay attention to the integration and coordination of relevant laws and regulations, but also pay attention to clearing up the laws and regulations on drinking water resources protection that are not compatible with the integrated development of the Yangtze River Delta,
and further promote the formation of a relatively unified and perfect legal environment for the ecological civilization construction in the region.

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