



Analysis and suggestions on the causes of problems found by water conservation supervision and inspection

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Abstract. In order to improve the current situation that the level of water conservation management in various parts of the province is generally not high, the water administrative department of Guangdong Province has continuously carried out on-site supervision and inspection of water conservation throughout the province in the past five years, and the on-site inspections are carried out through a combination of information access, on-site surveys, face-to-face inquiries and filling in survey forms. The water-saving problems of cities and counties (districts) found in the inspection process were sorted out and analyzed, and rectification opinions and suggestions were put forward. These have significantly improved the level of water-saving management of water administrative departments in various cities and counties (districts), and stimulated the enthusiasm of water-using units to save water to a certain extent.

Keywords: water conservation; planned water use; quota standards; Periodic verification; Unconventional water sources.

1 Introduction

At present, many countries in the world regard saving industrial water, using reclaimed water and wastewater, adopting water-saving water facilities, strengthening pipeline leakage control, and strengthening water-saving management as the key work of water conservation. In China, in Chapter 16 of China's Agenda 21, it is mentioned that "open source, water conservation, protection and management" is identified as an important policy for water control, and the necessity of water conservation is mentioned in many places throughout the text [1]. It can be seen that management is very important in water conservation, and on-site supervision and inspection of water conservation is an important means of water conservation management [2]. Since 2019, special water conservation supervision and inspection work has been carried out throughout China. Previously, water conservation supervision and inspection was carried out as part of the supervision and inspection of water resources. Since 2019, Guangdong province has

carried out supervision and inspection of water conservation in the province for five consecutive years [3] [4].

Every year, there are about 100 water administrative departments and water units randomly inspected in the province, and a total of about 480 have been randomly inspected since 2019. The water units sampled included general non-residential water units and universities. There are three types of on-site checklists: water administrative departments, general non-residential water use units, and universities. Each checklist includes about 20 checklists. For water use units, the contents of the checklist mainly include: whether to use water-saving appliances, whether the planned water is used every year, whether the water use efficiency exceeds the provincial water quota standard, whether to use unconventional water resources such as reclaimed water, etc. For water administrative departments, the inspection mainly includes: whether the main indicators of water conservation are incorporated into the government's performance evaluation system, whether it is found that the water quota for use should be used but not used is approved, whether the water use units that exceed the plan or quota are treated, whether unconventional water sources are allocated when preparing and issuing annual water use plans for water-scarce cities, and so on.

2 Analysis of the problems found in the inspection and their causes

In the past five years, through on-site supervision and inspection of cities and counties (districts) in the interior of the province, it has been found that there are two main problems: the problems of the water administrative department and the problems of the water use unit.

2.1 Analysis of problems and causes of municipal and county (district) water administrative departments

The problems existing in the water administrative departments of cities and counties (districts) mainly include the following four categories: irregular issuance of water use plans, inadequate implementation of the progressive tariff increase system for over-planned and over-quotas, unused unconventional water sources in water-scarce areas, and advanced water quotas for planning and new and reconstruction and expansion projects. The proportion of various types of problems is shown in Figure 1.

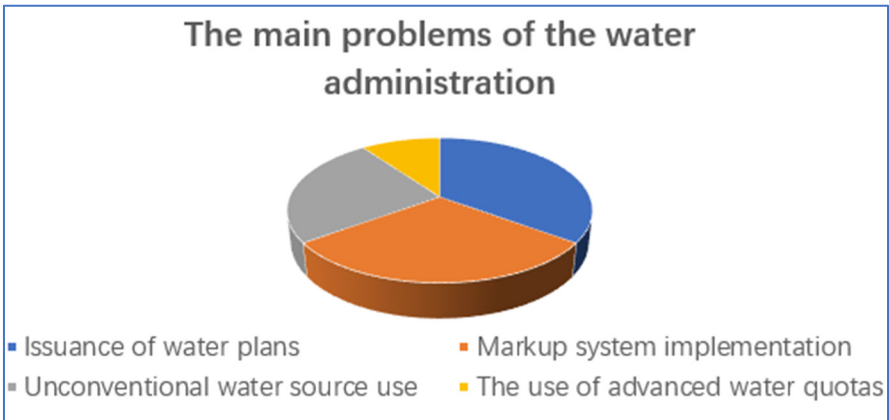


Fig. 1. The main problems of the water administration

(1) There are many problems in the issuance of water plans. Almost all of the water use plans of prefectures, cities and counties (districts) inspected did not have a detailed process of accounting for the use of water quotas, and were not based on actual water consumption in recent years or water quotas, or neither was considered; The issuance of the water use plan is not standardized, the water use plan is not issued in accordance with the prescribed time limit, or the notice of the water use plan is missing the date of issuance, and the water consumption of the water plan is not broken down to the month; The amount of water that is planned to be issued by the licensed water user is the permitted amount of water; The actual water consumption differs significantly from the planned amount of water used; The scope of planned water management is incomplete, and some prefectures and cities have not included all water units with an annual water consumption of more than 120,000 cubic meters into the planned water management. The water use plan is not approved according to the actual water consumption in recent years and is not based on the water quota, which is related to the fact that the water administrative department has not fully grasped the main parameters of water consumption production and water use by water use units. There are two main reasons why the scope of planned water management is incomplete: first, some old buildings in the old cities of prefectures and cities are old, the water pipe network is complex, the water used by residents and non-residents is mixed and difficult to separate, and the non-residential water users in the pipe network cannot achieve separate measurement and cannot approve and issue water use plans; Second, some water users have been drawing water in recent years, but their use is temporary in nature. The excessive value of the water use plan may be related to the fact that the local authorities consider that the lack of manpower is unable to bear the huge workload of exceeding the planned price increase and reduce complaints from water users[5] [6] [7] .

(2) The progressive markup system for over-planned and over-quotas has not been implemented or strictly implemented, and the problem of over-planned water use or over-quota water use in some water units has not been dealt with in a timely manner.

This is related to the lack of manpower, technical strength or neglect of management by the water administration responsible for supervision.

(3) Where counties and districts in water-scarce areas have the conditions to use unconventional water sources, most counties and districts do not associate water use plans with unconventional water sources. This is related to the fact that sewage treatment plants are far from water units that can use unconventional water sources, and it takes a lot of money to lay pipes to divert water, and most water users prefer to use tap water for cost reasons.

(4) The advanced value of unused water quotas for planning and new and reconstruction and expansion projects is related to the lack of strict review and control by the water administrative department.

2.2 Analysis of the problems and causes of water use units

The main problems existing in water users include the following five categories: water use exceeding the planned quota, failure to report or report the planned water use recommendations on time, water balance testing work not carried out as required or expired, water metering facilities for undivided sources and uses, and water meters not regularly verified in accordance with relevant measurement standards. The proportion of various types of problems is shown in Figure 2.

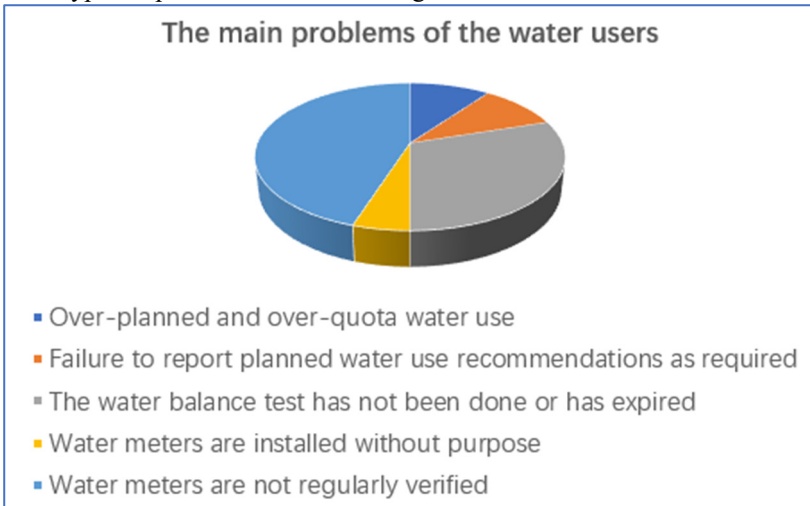


Fig. 2. The main problems of the water users

(1) A very small number of water users have exceeded the planned quota of water use. Part of it was caused by the three-year new crown epidemic, and many units suddenly increased their temporary water use due to the epidemic, and there was no separate measurement, and they could not deduct this part of the temporary water use, resulting in over-planned water use; However, most of them are caused by factors such as leakage of the water unit pipe network, incomplete realization of sub-purpose metering, or backward production technology and large water consumption.

(2) Some water users did not report or did not report planned water use proposals on time. Some are caused by the lack of cooperation and initiative of enterprises; Some of them are because the actual water consumption of the company in the current year can only provide the first 11 months.

(3) Water balance testing for some water units was not carried out as required or expired. This is related to the failure of the water administrative department to publicize the relevant regulations and requirements, and also to the lack of attention or limited business level of water users.

(4) Some water users did not install water metering facilities according to the sources and uses. This is related to the old and complex structure of the pipe network of some water units, and also related to the change in the use of some places in some water units, such as the laboratory of a university becoming a classroom.

(5) In addition to primary water meters, more than 90% of level II and below water meters are not regularly verified in accordance with relevant measurement standards. In many water units, level II and below water meters have not been verified after installation and use, except for the verification at the factory. The reason given by the water user unit is that the internal operation of the water unit requires 24 hours of non-stop water, and the water meter needs to be removed for verification. In fact, the current verification technology can be verified without removing the water meter. The water user unit does not have a complete understanding of the latest verification technology[8] [9].

2.3 Analysis of other existing problems and causes

There are no quota standards for 7 products or services, including: seafood market, water amusement facilities, wildlife park, mobile phone screens of different specifications and sizes, sports shoes, freight, toys, etc. The nature of water use by various water units is complex and diverse, and it is inevitable that the quota standard will not cover everything.

3 Rectification opinions

In view of these problems discovered by supervision and inspection, through in-depth analysis of the reasons for their existence, the following specific rectification opinions are put forward:

(1) Rectification opinions on the water administrative departments of cities and counties (districts).

(1) For the irregular filling of the planned water meter, it is recommended that the competent water administration department uniformly update and refine the format of the report on the water use plan in accordance with the relevant requirements and standards, conduct relevant training for the water use unit, scientifically approve the water use plan reported by the water use unit according to the actual water consumption and water quota standards of the water use unit in recent years, standardize the issuance

of the water use plan, and include all the water use units that should be included in the scope of planned water management into the scope of management.

(2) For those who fail to implement or do not strictly implement the progressive tariff increase system for exceeding the planned and over-quota quota, it is recommended that the water administrative department should strictly review the water use efficiency of the water use unit in strict accordance with the Ministry of Water Resources or local quota standards, and increase the implementation of the progressive price increase exceeding the planned and over-quota in strict accordance with the relevant regulations of the Ministry of Water Resources or local water conservation.

(3) The competent water administrative department should encourage water users who have the conditions to use unconventional water sources to use more unconventional water sources, truly relieve their concerns and difficulties in using unconventional water sources, and take into account the planned utilization of unconventional water sources when using water use plans.

(4) The water administrative department should strictly control the quality, and absolutely not approve and approve the planning and new and reconstruction and expansion projects that do not use the advanced value of the quota.

(2) Rectification opinions on water users

(1) Water users who exceed the planned water quota should find out the reasons for their excessive water quota as soon as possible, prescribe the right medicine, rectify as soon as possible, control the unit water efficiency within the general value of the quota, and control the unit water consumption within the planned range.

(2) If the water use plan is not reported or is not reported on time, the planned water use proposal shall be reported in a timely manner. If the actual water consumption of the current year cannot be provided through communication and consultation with the competent water administration department, the actual water consumption of the 12 months from December of the previous year to the first 11 months of the current year can be submitted as the reference value of the actual water consumption of the current year.

(3) If the water balance test is not carried out in accordance with the requirements of relevant regulations, the relevant unit shall be entrusted to carry out the water balance test as soon as possible.

(4) Where water metering facilities are installed without water sources or uses, water metering facilities should be installed as soon as possible by water source and use.

(5) If the water meter is not verified within the specified period, the relevant unit should be entrusted to verify the water meter as soon as possible.

4 Recommendations

(1) Carry out the implementation of problem rectification and reform, and strengthen the daily supervision and management of water users. Water administrative departments at all levels should conscientiously perform their responsibilities for water-

saving supervision, promptly formulate rectification plans for problems found in on-site inspections, and fully implement rectification tasks .

(2) Further raise awareness and strengthen multi-party joint supervision. The competent water administration department will cooperate with other relevant departments to establish a joint work supervision mechanism, improve the daily supervision system, improve the regular notification mechanism, and continuously improve the effectiveness of work.

(3) Strengthen the supervision of water use data and consolidate the foundation of supervision and management.

(4) The competent water administration department establishes a relatively fixed team of water conservation management personnel, and at the same time strengthens the business training of water conservation management personnel.

(5) Improve local quota standards. As soon as possible, we will supplement the formulation of quota standards for seven products or services, including seafood markets, water amusement facilities, wildlife parks, mobile phone screens of different specifications and sizes, sports shoes, freight, and toys.

(6) Relevant competent departments for water conservation have introduced affordable and feasible water-saving incentive methods to increase the enthusiasm of water-using units.

5 Conclusion

The results of water-saving on-site supervision and inspection work for several consecutive years are obvious. The level of water-saving management of water administration departments in various cities and counties (districts) has been significantly improved, and the enthusiasm of water-using units to save water has also increased a lot. In the next step, the province will further strengthen the training of water-saving management personnel of water administration departments in cities and counties (districts) to further improve their professional level.

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