China's sewage treatment industry status quo and improvement measures

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Abstract. Sewage treatment has greatly affected the promotion and implementation of China's sustainable development policies. At this stage, urban domestic and industrial wastewater discharge has become the main source of pollution for urban water resources in China. Urban domestic and industrial wastewater treatment is the top priority for saving water resources and protecting urban water bodies both now and in the future. This article analyzes the current status of China's sewage treatment from three aspects: policy, process, and industry operation status. It finds problems in China's sewage treatment, and puts forward reasonable suggestions.

Keywords: Sewage treatment, Status quo, Problem, Suggestion

1. Research background
With the rapid development of China's economy and urbanization process, development needs have caused social environment and natural resources. Great pressure. China has a large population, but it is dry and has little water. The per capita freshwater resources are only 2200m³, inhabited at the end. Therefore, to reduce water pollutant emissions, recycle water resources, and promote sustainable development of water conservancy projects. This is the fundamental solution to the problem of severe water shortage in China. With the rapid economic development, the pressure of water shortage is also increasing, and mankind finally realizes that water consumption has exceeded the range of natural water cycle carrying capacity. Mankind is increasingly aware of the rational use of water resources. The importance of the source can only be fully respected by the laws of nature's water cycle, and the renewable water resources can be recycled many times. Maintaining the balance of the natural water cycle is the effective way of sustainable recycling of water resources. And the sewage treatment system The establishment and application is an inevitable choice for the sustainable development of human society.

In order to discharge the sewage to a certain natural water body to meet the water quality requirements for reuse, the process of purifying is collectively called "sewage treatment". At present, with the increasing public attention to environmental protection, many sewage treatment projects have been introduced in the field, including environmental protection, petrochemical, medical, construction, metallurgy, etc. It can be said that with the people everyday life has inextricably linked relationships.

At present, urban domestic and industrial wastewater discharge has become the main source of pollution for urban water resources in China. Urban domestic and industrial wastewater treatment is the top priority in saving water resources and protecting urban water bodies both now and in the future.
2. The significance of sewage treatment
From the perspective of water quality and sewage treatment technology, domestic sewage contains more organic matter. It must be treated by sewage before it can be applied in areas with low water quality requirements, such as irrigation water, construction water, and cooling water. People have developed a variety of wastewater treatment technologies. Among them, wastewater treatment and recycling technology can be well applied to the purification and reuse of urban domestic sewage, thereby providing multi-purpose water for urban development.

From the perspective of water volume, most of the city's water will eventually be discharged in the form of urban sewage, so the water consumption and sewage discharge should be roughly equivalent. In addition, the rainfall provides the city with recycled water and effectively supplements the water consumption and sewage discharge. The difference part of the quantity.

3. Current status of China's sewage treatment industry

3.1. Analysis of policy environment
China's sewage treatment work began in the late 1970s and entered the 21st century. China's water quality has deteriorated seriously and the problem of water eutrophication has become prominent. The national and local people's governments attach great importance to this and have increased the intensity of urban sewage treatment plants. For the old sewage treatment plant to carry out the upgrading work. The “Thirteenth Five-Year Plan for National Urban Sewage Treatment and Recycling Facilities Construction Planning” requires that by the end of 2020, urban sewage treatment facilities must be fully covered, urban sewage treatment rate needs to reach 95%, county towns need to reach 85% The town needs to reach 70%. The "Thirteenth Five-Year Plan" made it clear that more capital will be invested in the construction of sewage treatment and recycling facilities, and encourage more private capital to actively participate in the construction of sewage treatment facilities.

3.2. Main processes used in sewage treatment
At present, China's sewage treatment mainly adopts five types of biological dephosphorization and denitrification process (A² / O), oxidation ditch denitrification and dephosphorization (A² / C), membrane bioreactor (MBR) and aerated biological filter (BAF). Process, A² / O process as shown.

3.3. Analysis of operation status of sewage treatment industry
From the perspective of water resources per capita, China's water resources per capita is only 2125 m³, which is far lower than the world's average level. China is facing severe water shortages. Saving water is the responsibility of every citizen. From the perspective of water consumption, with the development of the economy and society, coupled with the acceleration of the urbanization process, the total amount of water used in the country has continued to increase. As of 2013, it has increased to 617 billion m³, an increase of 11.21% compared to 2004. In terms of use, domestic water use has steadily increased, production water use has been relatively stable, and the overall situation is rising. This is in line with China's urbanization strategy, rapid economic development, and population growth. It is predicted that by 2030, China's water demand will increase to 700-800 billion m³, especially the largest increase in urban water demand. In summary, China's drought and lack of water, per capita water resources ranked at the end of the world, in the process of urbanization, urban water demand continues to increase, the water supply industry is facing heavy pressure. In this regard, the implementation of water resources recycling through technical means can provide an effective supplement to urban water use, which creates opportunities for the development of the domestic sewage treatment industry.

The main operating modes are mainly EP, EPC, BOT, BT, ROT, TOT, PPP and other modes. Among them, PPP mode refers to the government’s purchase of services, franchising or equity cooperation in order to enhance the supply capacity of public products. A cooperative relationship of risk sharing and benefit sharing. The project sponsor bids to the society. After the enterprise wins the bid, the government or the entrusting party shares the project company established by the winning bidder. The project
company signs a PPP agreement with the local government and obtains the project's franchise right to take charge of the project's investment, construction and operation. During the concession period, the project company's revenue includes construction revenue during the construction period and operating revenue during the operation period.

4. Problems encountered in sewage treatment in China

4.1. The construction of sewage facilities is not in place, and the sewage treatment rate is generally not high.
Relevant data show that there are still some cities in China that have not built sewage treatment plants. This situation is more common in administrative divisions at the town level. This also results in inefficient urban sewage treatment. In addition, the sewage treatment efficiency shows a geographical imbalance. Generally, the sewage treatment rate in the eastern region is higher than that in the western region, and the sewage treatment rate in the southern region is higher than that in the northern region. The main reason for this situation is the imbalance of economic development, which is also a problem that needs to be focused on in the future.

4.2. The average energy consumption of sewage treatment is high.
Sewage treatment involves many links and inevitably involves energy consumption. Urban sewage treatment plants often use electrical energy as the driving force for sewage treatment. But at this stage, many sewage plants have low technical indicators, resulting in higher average energy consumption in the sewage treatment process, which will not only increase the cost of urban sewage treatment, but also bring environmental pollution from another aspect.

4.3. Low employee performance.
In recent years, the global economy has become increasingly competitive, and wastewater treatment companies have continued to control labor costs through labor dispatch. Due to the special situation of this kind of labor relationship, dispatched workers often encounter severe unfair treatment, which greatly reduces their work performance. As a subjective factor, it also has a serious impact on the efficiency of sewage treatment.

In summary, China's sewage treatment not only has the objective problem of imperfect facilities construction, as an important strategic resource for enterprises, people are also very important subjective factors that affect sewage treatment. How does organizational fairness affect the performance of wastewater treatment work? In order to better improve wastewater treatment, this paper conducted an empirical study of employees in wastewater treatment enterprises to open the black box between organizational fairness and job performance.

5. Empirical research on the performance of sewage treatment plants

5.1. Inquiry objects and investigation process
The sample of this research comes from the front-line workers of enterprises such as Capital Capital, Zhongshan Public Utilities, Xingrong Environment, Jiangnan Water, etc. The first-line workers involved in the survey are all dispatched laborers. In the end, a total of 300 questionnaires were sent out, 270 were retrieved, and the remaining 265 were removed after ineffectiveness. The effective recovery rate was 98.1%. Among them, in terms of gender, the majority of male labor dispatch workers accounted for 81.1%. In terms of age, the majority of employees under 30 years old (including 30 years old) accounted for 84.2%. It can be seen that dispatched laborers are younger. In terms of academic qualifications, it is mainly junior college or below, accounting for 72.1%; in terms of working years, the majority of employees with 1-3 years account for 95.2%; in terms of job distribution, the number of grass-roots employees accounts for the vast majority, accounting for 91.7%. In terms of monthly income, the number of people below 2,500 yuan accounted for 83.4%. It can be seen that the educational background
of labor dispatch workers is generally low, the working period is short, and the development potential in the enterprise is small. Most of them are ordinary employees or front-line workers. At the same time, the wages are generally low.

This paper uses social contract theory to construct the four dimensions of organizational justice: distributional equity (E), procedural equity (F), information equity (G), and interpersonal equity (H) as independent variables, organizational identity (A) and organizational support sense (B) is an intermediary variable, the two-dimensional task performance of job performance (C) and relationship performance (D) are dependent variables, and the theoretical framework is put forward. Hypotheses H1a-H4b: the four dimensions of organizational equity and work performance The three dimensions are positively correlated; Hypothesis H5: Procedural fairness is positively correlated with organizational support; Hypothesis H6a-H6d: The four dimensions of organizational fairness are positively correlated with organizational identity; Hypothesis H7a-H8b: Two intermediary variables are associated with job performance The two dimensions are positively correlated.

This study used interviews and questionnaires. A total of 10 interviews were sought, confirming the rationality of the research framework and theoretical model. The concepts in this study use mature scales developed by researchers at home and abroad. Each method of scoring uses Likert's five-point scale, with a score of 1 to 5 ranging from "totally inconsistent" to "fully in line". In this paper, the establishment of structural equation model and the test of intermediary effect and the use of SPSS17.0 and LISREL8.7 software for descriptive statistical analysis, reliability analysis, exploratory factor analysis and confirmatory factor analysis, and by constructing a structure without intermediary variables Equation models, structural equation models with intermediary variables, and complete structural equation models are used to verify the hypotheses between variables.

5.2. Research results

Based on previous scholars' research, this paper has conducted an empirical study on the mechanism of the impact between the organizational fairness and job performance of labor dispatch workers in transportation companies. Research shows that for labor dispatch workers in the sewage treatment industry, there are four Concepts will positively affect job performance, with procedural fairness affecting the greatest degree, followed by distribution fairness and interpersonal fairness, and information fairness having the least impact. But the four concepts of organizational justice have different effects on the two concepts of job performance, which have a positive impact on task performance, and only information fairness will not affect relationship performance. The analysis in this study is probably due to the particularity of the research object. Since the dispatched workers are treated very unfairly in terms of salary, rewards and various benefits, they are more looking forward to fair distribution and fair respect, while they do not expect much from the fairness of access to information. In addition, in terms of the impact on task performance, organizational identity has a complete mediating effect on the relationship between interpersonal justice and task performance, while the other three constructs regarding organizational justice have a partial mediating effect. In terms of impact on relationship performance, organizational identity has a partial mediation effect on the relationship between distributional fairness, procedural fairness, interpersonal fairness and relationship performance. Organizational support has a partial mediating effect on the relationship between program justice and relationship performance.

6. Recommendations for sewage treatment in my country

Strengthen the construction of sewage treatment plants. Insufficient construction of sewage treatment facilities is an important reason for the difficulty of improving the efficiency of urban sewage treatment in China. Therefore, in order to effectively solve this problem, it is necessary to increase capital investment and enhance the construction of urban sewage treatment plants. At the same time, the old sewage treatment equipment that has been in existence should be improved and optimized in time to improve its sewage treatment efficiency, ensure the compliance rate of drainage, and reduce pollution to the ecological environment.
Reduce the average energy consumption of water treatment. Excessive energy consumption is the main factor that causes high operating costs of urban sewage treatment plants in China. Therefore, in order to minimize the cost of sewage treatment on the basis of environmental protection, it is necessary to adjust and improve the energy consumption links of sewage treatment. Reduce the average energy consumption of water treatment, and promote the development of energy-saving sewage treatment.

From the system level, we will vigorously improve the various concepts of organizational justice. Sewage treatment enterprises should create a series of fair and effective salary performance management systems for dispatched laborers to ensure the fairness of the final distribution results. Companies should also create a series of labor dispatched workers participation, grievance and monitoring systems to help improve employees' sense of organizational justice.

Sewage Enterprises should establish a set of labor dispatch workers participation, appeal and supervision system, give full play to the role of collective bargaining, and at the same time strengthen the protection role of labor unions for labor dispatch workers' rights. For labor dispatch workers, there is currently no formal organization that can guarantee their right to appeal, which is extremely detrimental to labor dispatch workers. The scope of rights protection of trade union organizations should be expanded, and the rights of labor dispatch workers should also be included in the scope of protection. Performance.

Focus on the improvement of sewage factors from the corporate culture level to increase job performance. Improve the connection between the enterprise and the labor dispatch workers and the formal employees, and build a harmonious cultural atmosphere and communication place. When making decisions and evaluating the performance of subordinates, superior leaders should be objective and fair. Managers should have a spirit of tolerance and humbly adopt the suggestions of subordinates, so that employees can dare to express their point of view. Secondly, labor dispatch workers should also get along well with regular employees and labor dispatch workers, and maintain good communication and interaction with each other. Communication can eliminate conflicts, enhance cohesion, form a harmonious working atmosphere, and improve work performance.

Proper disposal of sludge. The process of sewage treatment will be accompanied by the generation of a large amount of sludge. If it is not effectively and properly disposed of, it may cause environmental pollution. For disposal, according to the actual situation, rationally choose sludge disposal methods, such as sanitary landfill, incineration, etc., and strive to achieve better disposal results with smaller inputs.

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