

Charge Reform in China's Wastewater Treatment Sector

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Abstract

China has made efforts on charge reform in wastewater treatment sector by issuing various policies and regulations since late 1990s and this process is still on the move. China has not only worked on the policies development for wastewater treatment, but also on the charge formation and level, the charge regulation and the financial approaches etc. The underway research on benchmarking system conducted by the Ministry of Construction is expected to introduce the internal competition among the companies of wastewater sector, providing the government an effective instrument for cost control, charging regulation and performance supervision. Charge reform is a necessary step in the transition to a market economy and an important step for Chinese wastewater management, but this reform is a complex and slow process and cannot be resolved in a 'one-shot' reform. This reform has been present in most cities of China, but the reform is facing a number of difficulties.

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1 Introduction

Water tariff¹ reform including wastewater treatment charge reform is a necessary step in the transition to a market economy, also an important step for China's wastewater management. The objective of charge reform is to lead to a long-term sustainable development of urban wastewater service and adequate financing for wastewater utilities. This reform is a complex process and cannot be resolved in a 'one-shot' way. Water tariff reform includes substantial changes not only in tariff formulation and levels, but also in water regulation, business environment, financial approaches, subsidies and public regulation. China has made and is making considerable efforts for collecting wastewater treatment charge and increasing charge rates since late 1990s. With the promotion of the marketization reform² of water sector by introducing competition and

¹ A *tariff* is the system of procedures and elements, which determines a customer's total water bill (any part of that bill can be called a *charge*, measured in money/time units or money units alone; and any unit price can be called a *rate*, usually measured in money/volume units). In China, a *water tariff* is a system composed of four major parts: water resource charge, charge of water engineering, water supply price, and wastewater treatment charge, the State Council of China, 2004.

² The so-called 'marketization reform' means to move the centralized planning economy to the market economy, this reform process including the organizational reform of water service providers, introducing competition, involving private sector, creating multi-levels governance, institutionalizing the water management etc.

opening to private sector since 2002, Chinese Government calls for the charge reform and emphasizes to increase the charge rates in order to accelerate the development of wastewater treatment sector; also with the support and technical assistant from the ADB, the WB, the OECD and other international organization, the Ministry of Construction (MOC), the State Environmental Protection Agency (SEPA) etc. have conducted relevant researches on urban water sector management. Referenced from the latest research report of the WB and the MOC, Chinese Government is attempting to establish benchmarking systems of water supply sector and wastewater sector in order to introduce competition within the sector and reduce cost, to control the cost and to improve the sector performance, and this system is expected to be applied for setting charge rates and regulating charge system of wastewater treatment later. All have done positive contributions to wastewater management though there are still a number of problems to be solved.

This paper provides an overview for charge policies in wastewater treatment sector in China. In the next section we will summarize the development of China's charge policies and regulations of urban wastewater treatment and introduce policy's implementation up to now. This will be followed by an analysis of the key issues in the current charge system for urban wastewater treatment. The final section provides conclusions and remarks of this paper.

2 Charging policies and regulations of urban wastewater treatment

It was the central and local governments that invested, operated and managed the WWTPs and the publics were not charged for wastewater treatment before 1980s. From 1984, the State Council proposed to collect charges for urban sewerage facilities in order to improve water use efficiency and water conservation (the State Council, 1984, 1987) and cities began to collect charges for sewerage facilities in succession since 1993³. However, there was no specific charge defined for wastewater treatment until 1997. Up till now, we could divide the development of charging wastewater treatment into two phases since 1997.

This first phase between 1997 and 2002 is a period of introducing the notion of wastewater treatment charge, and also institutionalizing the charging system. This is a reflection to the fact that rapid urbanization and economic growth in China has resulted in an increased pollution of surface waters, and rivers are losing their functions for drinking water resources, swimming, sporting, and even landscaping and irrigation. With the promulgation of *PRC Water Pollution Prevention Law* in 1997, the Central Government claimed to collect wastewater treatment charges from all water users for constructing wastewater treatment infrastructures in order to prevent the deterioration of surface water quality. Meanwhile, the Central Government commenced experimental practices in the cities in the Three Rivers (the Huai River, the Hai River and the Liao River) and Three Lakes (the Tai Lake, the Chao Lak and the Dian Chi Lake) basins.

Since then, all the issued policies and regulations in respect of water supply price, water conservation or the water sector reform claim to foster the establishment of charge

³ On 23 April 1993, the state price authority and the Ministry of Finance issued a specific circular on charging and collecting the urban drainage facilities. It required the municipal construction authorities to charge all enterprises, undertakings and individuals who discharge wastewater to the sewers directly or indirectly. The charge rate should be made and approved by the provincial construction authorities and price authorities.

system for urban wastewater treatment and increase the charge rates to assure the least cost for wastewater service in the long run. The main relevant policies and regulations are listed as following: the *Administrative Method on Urban Water Supply Price* (the SC, 1998), the *Circular on enhancing the collection of wastewater treatment charges and establishing the municipal drainage discharge system and common treatment system* (No.1192 Price Policy Paper by the NDPC, MOC and SEPA, 1999), the *Circular on Enhancing Water Conservation in Urban Water Supply and Prevention of Water Pollution* (No.36 Policy Paper by the SC, 2000), the *Circular on Accelerating the Reform of Urban Water Supply Price* (No.515 Price Policy Paper by the NDPC, MOF, MOWR and SEPA, 2002). All cities are required to collect wastewater treatment charges according to the No.1192 Price Policy Paper issued by the NDPC, MOC and SEPA in 1999. The charges for wastewater treatment are calculated based on the volume of water consumption and collected along with the water supply cost. The governments also proposed to set the charge rates in terms of the economic O&M cost for wastewater treatment and to increase the charge rates by steps to meet the requirement of a full-cost recovery of wastewater treatment in due time.

With the promulgation of the *Circular on Advancing the Industrialization of Urban Wastewater Treatment and Municipal Solid Waste Disposal Sectors* (No.1591 Policy Paper by the NDPC, MOC and SEPA, 2002), China started to broaden the finance channels for constructing wastewater infrastructures and introduce private sectors to invest, operate and manage the urban wastewater treatment system, as well as to reform the management system of wastewater service and the charging system. The second phase of the charging system for wastewater treatment is characterized by applying the economic approaches, such as the notion of full-cost recovery to set the charge rate of wastewater treatment. Subsequently, the following issued policies, as the *Circular on Accelerating the Reform of Water Price, Promoting Water Conservation and Protecting Water Resource* (No.36 Policy Paper by the SC, 2004) and the *Opinions on Strengthening the Regulation of Urban Wastewater Treatment Plants* (No.153 Policy Paper by the MOC, 2004) have also emphasized to accelerate the charge reform of urban wastewater treatment by applying economic rules and market mechanism.

3 Key issues of the charge system for wastewater treatment in China

The Chinese Government has promulgated charge policies and other relevant policies for urban wastewater treatment charge reform, concerning the charge rates making, the setting process, the means for billing, the administration of collected charges, the creation of a market environment etc. In the past 10 years, the notion of wastewater treatment charge has been introduced to all urban residents and embodied in the water tariff in many cities.

On the other hand, the empirical evidences of existing practices have demonstrated that the charge reform process is a long-term and very complex reform and cannot meet the targets in a short period. The charge reform for wastewater treatment is put in a difficult situation due to various social, economic, political factors. The current charge systems of wastewater treatment in China are facing many problems concerning low charge rates far from cost recovery, low collection rate of wastewater treatment charges, slow reform process, non-transparent charge setting process, ill-institutions, lack of regulation etc. In this paper, we just focus on the following four key issues within current charge systems for wastewater treatment, but we also consider the problems faced are much more than the below for current charge system of wastewater treatment in China.

3.1 Cost recovery problems

Cost recovery is one of the general principles of charge reform. It means the revenue produced from charges could be sufficient to meet the financial needs of the utility, including operations, maintenance, and administration. Up till now, the real charge rates are still at a low level, far from the full-cost. Referenced from a survey conducted by the NDRC and the MOC in 2003, 325 of total 668 cities from 30 provinces (excluding Tibet) have established and run the charging system of wastewater treatment by 2003. The charge rates in most of cities are still quite low and cannot cover the O&M cost. About 34.5% of the 325 cities which have collected wastewater treatment charges have a low charge rate of less than 0.30RMB/m³ (see Table 1).

Table 1 Charge rates of wastewater treatment (2003)*

Rates of WWTC (RMB/m ³)	Less than 0.30	0.30-0.50	0.50-0.70	More than 0.70	uncertain	total
Numbers of cities	112	80	17	10	106	325
Percentage (%)	34.5	24.6	5.2	3.1	32.6	100

Note: the charge rates are ones for households.

(Source: Survey Report on the industrializations and marketization of wastewater treatment and MSW treatment by SDRC & MOC, Dec 2003)

In sum, the charge rates are still quite low and very far from cost recovery in most cities. According to the latest charge rates of 27 provincial capitals (see Table 2), about 50% of the 27 cities are implementing a low charge rate of less than 0.5RMB/m³ up till now. At present, most cities are required to increase charge rates of wastewater treatment, and have organized public-hearing to hear the public's voice. However, the process has encountered difficulties and the public refused to increase charge rates in some cities.

Table 2 Charge rates of wastewater treatment of provincial capitals (2005)*

City name	Charge rate (RMB/m ³)	City name	Charge rate (RMB/m ³)	City name	Charge rate (RMB/m ³)
Beijing	0.90	Harbin	0.50	Wuhan	0.80
Tianjin	0.60	Shanghai	0.90	Changsha	0.40
Shijiazhuang	0.60	Hefei	0.51	Guangzhou	0.70
Taiyuan	0.25	Fuzhou	0.45	Nanning	0.50
Huhehaote	0.35	Nanchang	0.22	Haikou	0.45
Shenyang	0.50	Jinan	0.36	Chongqing	0.60
Changcun	0.40	Zhengzhou	0.65	Chengdu	0.35
Guiyang	0.40	Kunming	0.50	Xi'an	0.36
Lanzhou	0.30	Xining	0.27	Yinchuan	0.40

Note: the charge rates are ones for households.

(Source: database of www.h2o-china.com, June 2005)

Though cost recovery is regarded as one of the basic functions of charges, we cannot neglect the specifics of wastewater sector. The wastewater services, including collection, treatment and sludge disposal, are purely public goods as no one can be excluded from pollution. According to the principle of "who pollute, who pay", each resident has the

responsibility to pay for the wastewater treatment. At the same time, the charges for wastewater treatment have an obvious social impact and this impact should be addressed using governmental subsidies, which are beyond the wastewater utility operations and competence. It is obvious that charge policies have a positive contribution for wastewater sector development; however, the reform process should be implemented by steps and guided by a systematic planning, taking into account the specifics of wastewater sector, in particular the characteristics of public goods, also taking into account the historical and social reasons, in particular the interest of poverty.

3.2 Benchmarking system is expected to address the problem of deficient information of cost and performance for governments

Charge setting is a necessary step of charge reform; it includes not only the charge structure and levels, but also the rationality of calculated elements. Traditionally, the wastewater service was provided by the government, which means it was the government sector or undertaking unit to operate the infrastructure. As it were, the governments didn't concern about the cost of wastewater treatment and said nothing of the rationality of the cost formation. The deficient information in hands for governments has caused many difficulties for cost regulation in water sector.

In order to address this problem, the MOC conducted the research on benchmarking system for wastewater sector which, has been considered as one of effective instruments for cost control and performance supervision and applied in many countries or organizations, such as IWA, the UK, Chile, and the Netherlands etc. Benchmarking system is a long-term and continuous process, searching for the best practice within the wastewater sector, comparing the performance, analyzing the advantages and disadvantages, and improving the performance to meet the best one. Meanwhile, the establishment of benchmarking systems is a complex process, concerning the selection of appropriate indicators, the institutional reform, the organization and process for implementation, and the policies development etc. Up till now, the conceptual study has been finished and the MOC intends to commence the continued research and brews to conduct an experienced project.

It is difficult to give an assessment for the underway research now, but it is a reflection of the fact that Chinese Government has kept an eye on the regulation issue and is making some considerable efforts. It is a good start to develop the benchmarking system for water sector management.

3.3 Slow reform process putting the sector development in a difficult situation

Wastewater charge reform is already taking place in most cities of China. The governments put the charge reform process into an integrated market environment. The hardships are the reduction of the governmental financial support both from the state and local-level during transitional phase, changing the governmental attitude toward economic and sustainability goals of water sector. However, this process is slow. The conducted wastewater treatment charges and increased charge rates have resulted in a low billing percentage. This unbilled problem also impacts the billing percentage of water supply because both are calculated in one bill and collected by the water supply company. Up till now, not only the charge rates are still at a low level, but also the collection rate of wastewater treatment charge still keeps a low level. Referenced from the survey conducted by the NDRC and the MOD in 2003, less than 15% of the 325

cities reach a collection rate of over 90% and about 15% of the cities had a lower collection rate of less than 50% (see Table 3).

Table 3 Percentage of wastewater treatment charge collection (2003)*

Percentage of charge collection	Less than 30%	30 – 50%	50 – 70%	70 – 90%	More than 90%	uncertain	total
Numbers of cities	16	31	56	69	40	113	325
Percentage (%)	4.9	9.5	17.2	21.3	12.3	34.8	100

Note: calculated only for households.

(Source: Survey Report on the industrializations and marketization of wastewater treatment and MSW treatment by SDRC & MOC, Dec 2003)

Charge reform delay of wastewater treatment also directly puts the national strategy of water sector marketization reform in a difficult situation. Charges based on cost recovery are one of the incentives for private sector. Both the low charge rates and the unbilled charges make the private sector hesitate to participate in this sector because the charges are the main funding for governments to pay for the wastewater services, in particular for most local government with poor financial and economic status.

3.4 Current charge setting systems do not function well

There is a huge discrepancy between the charge setting of wastewater treatment and the price setting of water supply though both of them are calculated in the same bill. In China, the water supply price is decided mostly by the municipal-level governments and it is one of the income sources for water supply enterprises. In contrast, the charge of wastewater treatment is decided by the provincial-level governments and collected as one of the income sources of public finance and turned over to the competent authorities of wastewater treatment. The collection and appropriation of wastewater treatment charges are in two ways respectively.

The current charge setting system has resulted in ill-defined accountabilities between the provincial and municipal government for water tariff setting in practice, also the dissatisfaction of water supply companies where the water supply and wastewater services are separated. Furthermore, the local governments have deficient cost information for regulation and the current employed cost-based scheme cannot reflect the real cost of wastewater service. Up till now, no city has establish an effective framework for cost regulation and charge regulation of wastewater management in China, even some governments have not been aware of the critical situation of regulation.

4 Conclusions and recommendations

Charge reform of wastewater treatment is on the move in China, the process is complex and slow. Wastewater services, as purely public goods, need all-levels governments' accountabilities to foster the sector development, including the charge reform. All-levels governments should make the charge reform strategies for wastewater treatment, the charge targets, the charge rates and the charge setting process in terms of the specifics of wastewater sector, requiring comprehensive restructuring of socio-economic relationships.

China Government has to do more efforts on the charge reform according to the current policies framework and empirical evidences. The following elements should be concerned in the subsequent reform:

- Governments should collect and analyze the information on wastewater utility performance and cost.
- Government should keep financial support for wastewater sector though the charges are expected to meet all the financial need of utility in the long run, in particular in the transition phase.
- Government should create incentives for increasing water use efficiency in consumers and the utility operation efficiency in service providers.
- Make clear-defined accountabilities among different levels governments.
- Government should establish an effective regulatory framework, including cost regulation, setting process regulation and final charge regulation.
- The process of charge making should be transparent.
- Shift the wastewater treatment charge as an environmental tax.
- The public must have access and participate in the charge decision process.
- Governments should foster and accelerate the institutional changes, including the public-private-partnership.

Abbreviations

ADB	Asian Development Bank
IWA	International Water Association
MOC	Ministry of Construction
MOF	Ministry of Finance
MOWR	Ministry of Water Resource
NDPC	National Development and Planning Commission
OECD	Organization of Economic Co-operation and Development
PRC	People's Republic of China
SC	State Council
SDRC	State Development and Reform Commission (formerly NDPC)
SEPA	State Environmental Protection Agency
WB	World Bank
WWTP	wastewater water treatment plant

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