

Governing Urban Water Flows in China

Promotor:

Prof.dr.ir. A.P.J. Mol

Hoogleraar Milieubeleid

Wageningen Universiteit, Nederland

Samenstelling Promotiecommissie:

Prof.dr. S.W.F. Omta

Wageningen Universiteit, Nederland

Prof.dr. W. van Vierssen

KIWA Water Research, Nederland

Prof.dr. Jining Chen

Tsinghua University, P.R. China

Dr. N. Heerink

Wageningen Universiteit, Nederland

Dit onderzoek is uitgevoerd binnen de onderzoekschool SENSE Graduate School.

Governing Urban Water Flows in China

Lijin Zhong

Proefschrift

ter verkrijging van de graad van doctor
op gezag van de rector magnificus
van Wageningen Universiteit
Prof.dr. M.J. Kropff,
in het openbaar te verdedigen
op maandag 17 december 2007
des namiddags om 13.30 uur in de Aula

Zhong, Lijin

Governing Urban Water Flows in China/Wageningen University

PhD-Thesis Wageningen University

ISBN 978-90-8504-831-2

To my deeply beloved parents

Preface

Four years ago, when I firstly came to Wageningen University and touched upon the discipline of environmental sociology, I did be interested in and inspired by its ideas and successful application in addressing various environmental problems within different contexts. While the traditional management of Chinese water sector is argued to have complicated institutional problems during its modernization process, it is a promising attempt to understand and deal with these problems with the environmental sociological perspective. As shown on the cover, the Dragon, the Chinese mythical god in charge of water, is going to govern water by new means.

This doctoral research had been implemented in the framework of ENRICH (Environmental Management in China) projects, a collaborative education and research program between Wgeningen University in the Netherlands and Tsinghua University in China. The project was sponsored by SAIL foundation, to which I am quite appreciated.

I am quite lucky to be the student of Professor dr. Arthur Mol and full of gratitude to his invaluable support and suggestions not only to this research topic but also to my research career. This thesis cannot come into being without his great enthusiasm of and commitment to this research topic. What I have learnt from him will benefit me greatly for my future lifetime.

I highly appreciate Prof. dr. Jining Chen, the program leader of Tsinghua University. I could never have come to the Netherlands for this research without his trust and recommendation. Special thanks go to Prof. dr. P.P.S.Ho and Dr. Pengfei Du, the program coordinators of the ENRICH project, for their all helpful arrangements which enabled me to actively participate in this programs as well as to concentrate on my PhD research.

I would extend appreciation to Dr. Bas van Vliet for his stimulating comments on my dissertation. I owe many thanks to Dr. Tao Fu for providing me great supports for my field work. I am grateful to Dr. Lei Zhang, Dr. Yi Liu, Prof. dr. Gert Spaargaren, Prof. dr. Jan van Tatenhove, Dr. Peter Oosterveer, Dr. Simon Bush, Mr. Michael Rouse, Mr. Keith Stallard, Mr. Joe Zhao, Mr. Michael Wong, Dr. Can Wang, Prof. Tianzhu Zhang, Dr. Miao

Chang, for their helpful discussion on either the theoretical issues or the ideas on Chinese water governance.

I owe many thanks to the officials and experts and friends that have helped me during my field works. Special thanks go to Mr. Yue Zhang, Mrs. Lizhen Zhang, Mr. Wentang Pan, Mrs. Wei Han, Mr. Yang Wang, Mr. Zipin Cai, Miss Lily Fong, Mr. Felix Fan, Mr. Shaohua Zeng.

I am grateful to all colleagues and fellow PhD candidates at the Environmental Policy Group in Wageningen University for their kind support, encouragement and academic sharing, as well as for the harmonious and friendly working environment. I wish to extend my special thanks to Ms. Corry Rothuizen, always being there, for her support to me and my family. My special thanks go to Dr. Dries Hegger for his helpful and enjoyable discussions and Drs. Elizabeth Sargant for her help on the Dutch translation.

I would like to thank all my Chinese friends both in the Netherlands and Tsinghua University. Special thanks go to Dr. Junming Li, Dr. Qiu Sun, Dr. Mingpeng Chen, Dr. Fu Sun, Miss Xin Dong, Mrs. Yuan Ma, Mrs. Lingyun Zhu, Drs. Xiucheng Fan, Drs. Dan Liang, Drs. Juanwen Yuan, Drs. Yuan Zhang, Mr. Yiding Wang, Drs. Jingyi Han, Drs. Guangqian Peng, Drs. Zhongkui Sun, Prof. Jihua Yu, Prof. Lu Zhang, Prof. Hanping Mao, Mrs. Lingzhi Li, Mr. Chunguang Li, Mr. Zhi Lin, for their helps and sharing of joys and sadness with me.

I am in great debt to my parents, sister and beloved Xinlong, for their love, understanding and support over the years.

Beijing, October 2007

Contents

Preface	i
Contents	iii
Lists of Tables, Figures, Boxes, Maps and Appendices	vi
Abbreviations	ix
Chapter 1 Introduction	1
1.1 General Introduction	1
1.2 Urban Water Governance in China	5
1.2.1 Urban Water Sector Development in China	6
1.2.2 Government Organizations for the Urban Water Sector in China	8
1.2.3 Reform in the Water Services Enterprises	11
1.3 Research Questions	12
1.4 Structure of Thesis	13
Chapter 2 Modernizing Urban Water Governance in Transitional China	15
2.1 Introduction	15
2.2 Ecological Modernization Theory: A Historical Perspective	16
2.3 Ecological Modernization Theory in China	21
2.4 Modernizing Urban Water Governance for China	23
2.4.1 Water Institutions and Urban Water Governance	24
2.4.2 Ecological Modernization of Urban Water Governance	25
Intermezzo: Research Methodology	33
A. Introduction	33
B. Research Design	33
C. Research Strategy	35
C.1 Large Scale Survey Research	36
C.2 Case Studies Research	38
C.3 Quantitative Modelling	43

Chapter 3 Water Price Reforms in China: Policy-Making and Implementation	45
3.1 Introduction	45
3.2 Ecological Modernization and ‘Economizing of Ecology’	47
3.3 Water Pricing Reforms in China	49
3.4 Water Tariff Reforms of Guizhou Province	60
3.5 Conclusions	67
Chapter 4 Public-Private Partnerships in China’s Urban Water Sector	73
4.1 Introduction	73
4.2 Private Sector Participation as Part of Modernizing Urban Water Governance	75
4.3 Privatization Policy in China’s Water Sector	78
4.4 The current Landscape of Private Sector Involvement	81
4.5 Three Case Studies of Public-Private Partnerships	88
4.6 Conclusions	101
Chapter 5 Private Participation in China’s Wastewater Service under the Constraint of Charge Rate Reform	107
5.1 Introduction	108
5.2 Dependence of Private Participation on Public Investments	109
5.3 Public-Private Partnerships in China	114
5.4 Conclusions	117
Chapter 6 Participatory Environmental Governance in China: Public Hearings on Urban Water Tariff Setting	119
6.1 Introduction	119
6.2 Participative Policy-Making and Public Hearings	122
6.3 Setting Water Tariffs: Institutionalizing Public Participation	124
6.4 Public Hearings Implemented: Maanshan City and Guiyang City	130
6.5 Public Hearings on Water Tariff Setting	136
6.6 Conclusions	145
Chapter 7 Conclusions	151
7.1 Introduction	151

7.2 Institutional Changes for Modernizing Urban Water Governance in China	152
7.3 Trends of Ecological Modernization in China	158
7.4 Ecological Modernization Theory for State-in-Transition	160
7.5 Implications for Future Research	165
References	167
Appendices	183
Summary	187
Samenvatting	191
About the Author	195

Lists of Tables, Figures, Boxes, Maps and Appendices

List of Tables

Table 1.1 Major National Organizations in China's Water Management	10
Table C.1 Major Methods of Data Collection	36
Table 3.1 Overview of Major National Water Policies with Economic Incentives	50
Table 3.2 Rates of Raw Water Fee of Water Resource System	62
Table 3.3 Rates of Water Resource Fee in Guizhou Province, 1993	64
Table 3.4 Rates of Water Resource Fee in Guizhou Province, 2007	66
Table 4.1 Different Forms of Private Sector Participation in China's Water Sector	82
Table 5.1 Percentage of WWTC Collection, 2003	117
Table 6.1 Number of Questionnaire Samples in 17 Cities	142

List of Figures

Figure 1.1 China's Economic Growth and Urbanization, 1978-2005	2
Figure 1.2 Water Supply Capacities in China, 1991-2005	7
Figure 1.3 Wastewater Treatment Capacities in China, 1991-2005	8
Figure 1.4 Hierarchical Government Administrations for Water Management in China	9
Figure 1.5 Liberalization and Commercialization of Water Service Providers	12
Figure 2.1 Government to Governance for Urban Water Sector	26
Figure 2.2 Major Actors and Their Relations in Urban Water Sector Governance	28
Figure 3.1 Water Tariff Structure	55
Figure 3.2 Average Costs and Water Tariffs of 36 Key Cities in China, 2000-2003	56
Figure 3.3 Average Annual Growth Rate of Water Tariffs, 2001-2004	57
Figure 3.4 Domestic Water Use and Industrial Water Use, 2000-2005	59

Figure 3.5 Domestic Water Use by Provinces, 2002-2005	59
Figure 3.6 Water Use for Households and Industries in Guizhou Province, 2002-2005	67
Figure 4.1 Private Sector Participation in Water: Distribution over Modalities, 2005	84
Figure 4.2 Distribution of Private Sector Participation in Water Projects by Capacities	86
Figure 4.3 Distribution of Private Sector Participation in Water Projects by Provinces	87
Figure 4.4 Organizational Structure of Maanshan Water Supply System	90
Figure 4.5 Total Length of Pipes and Annual Water Provision in Maanshan, 1995-2004	92
Figure 4.6 Monetary Flow within Maanshan Water Supply	93
Figure 4.7 Organizational Structure in Macao Water Supply	95
Figure 4.8 Annual Water Demand-Provision and Water Loss of Macao, 1982-2005	95
Figure 4.9 Water Tariff Rates of Macao, 1982-2005	96
Figure 4.10 Monetary Flow within Macao Water Supply	97
Figure 4.11 Private Sector Involvement in Shanghai Wastewater Treatment	99
Figure 4.12 Monetary Flow within Shanghai Zhuyuan Greenfield Project	100
Figure 5.1 The WWTC Rate and the Required Ratio of Public Investment	112
Figure 5.2 Ratio of Public Investment at a Certain WWTC Rate	113
Figure 5.3 The Major PPP Types Applied in China's Wastewater Sector	114
Figure 5.4 Dependence of Private Investment Scale on Public Investment	116
Figure 6.1 Institutional Arrangements and Actors in Water Tariff Setting in China	129
Figure 6.2 Water Tariffs for Different Consumers	131
Figure 6.3 Participants in 2003 Water Tariff Public Hearing, Maanshan City	134
Figure 6.4 Number of Public Hearings for Setting Water Tariffs	138
Figure 6.5 Residents' Perception and Familiarity on Price Public Hearings in 17 Cities	143

List of Boxes

Box 1.1 Recent Water Pollution Events Reported in China	3
Box 1.2 China's Administrative System	8
Box 6.1 Major Policies and Regulations Related to Water Price Management	125
Box 6.2 Maanshan Price Public Hearings Manual [Maanshan Jiage Tingzheng Shouce]	132

List of Maps

Map 1 Location of Guizhou Province, China	40
Map 2 Location of Maanshan City, Shanghai City and Macao City	41
Map 3 Location of Maanshan City and Guiyang City	43

List of Appendices

Appendix I List of interviewees	183
Appendix II Major Data Sources	185

Abbreviations

ADB	Asian Development Bank
BCG	Beijing Capital Group
BJDRC	Beijing Development and Reform Commission
BOD	biological oxygen demand
BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
CCICED	China Council for International Cooperation on Environment and Development
CD	the competent department (of water sector, e.g. Maanshan Construction Commission)
COD	chemical oxygen demand
EM	Ecological Modernization
FYP	Five Year Plan
GDP	Gross Domestic Product
GO	government organization
GOSC	General Office of the State Council
IACM	Macao water quality regulator
IC	individual consumers elected by communities
IMF	International Monetary Fund
JV	joint venture
MAS-BCWLC	Maanshan Beijing Capital Water Co. Ltd.
MASCC	Maanshan Construction Commission
MASWSC	Maanshan Water Supply Company
MOC	Ministry of Construction
MOF	Ministry of Finance
MOH	Ministry of Health
MOLR	Ministry of Land Resources
MOP	Macao currency (1 MOP = 0.965 RMB, in 2007)
MOWR	Ministry of Water Resources
MOWREP	Ministry of Water Resource and Electric Power
MPC	Maanshan People's Congress

MPPCC	Maanshan People's Political Consultative Conference
MWC	Macao Water Company
MWSL	Macao Water Supply Ltd.
NBS	National Bureau of Statistics
NDPC	National Development and Planning Commission
NDRC	National Development and Reform Commission
NGO	non-governmental organization
NPC	National People's Congress
OECD	Organization for Economic Co-operation and Development
PCC	(local) People's Congress Council
PG	seats in public gallery
PLC	public limited company
PO	public organizations
PPP	Public-Private Partnership
PRC	People's Republic of China
RMB	Chinese currency
RW	raw water (in Chapter 6)
RW	reclaimed water (in Chapter 3)
SASAC	State-owned Assets Supervision and Administration Commission
SCNPCC	Standing Committee of National People's Congress Council
SCPCC	Standing Committee of (local) People's Congress Council
SEPA	State Environmental Protection Administration
SOE	State-owned Enterprise
SS	stock system (in Chapter 5)
SS	suspended solids (in Chapter 4)
SW	solid waste
TNCs	transnational companies
TOT	Transfer-Operate-Transfer
TVEs	Town and Village Enterprises
UC	unit consumers
UNCED	United Nations Conference on Environment and Development
USD	US dollar
VAT	value added tax

WR	water resource
WRS	water resource system (or hydraulic engineering)
WS	water supply
WTP	water treatment plant
WW	wastewater
WWTC	wastewater treatment charge
WWTP	wastewater treatment plant

Chapter 1 Introduction

Over 2000 years ago, a famous Chinese philosopher, Lao Tze, noted:

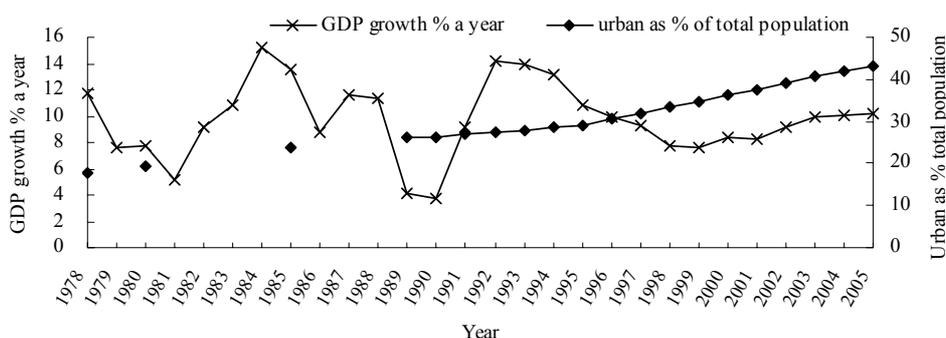
... The sage's transformation of the World arises from solving the problem of water. If water is united, the human heart will be corrected. If water is pure and clean, the heart of the people will readily be unified and desirous of cleanliness. Even when the citizenry's heart is changed, their conduct will not be depraved. So the sage's government ... consists of talking to people and persuading them, family by family. The pivot (of work) is water.

1.1 General Introduction

China is one of the most outstanding countries in the world of today in economic achievement. Together with its amazing economic growth, rapid urbanization and industrialization; it has wreaked havoc with severe environmental pollutions and degradations. Since the launch of the 'open door' policy in 1978, China has been witnessing an unprecedented period of continuous high economic growth in history, with an average 9.67% GDP growth a year in 1979-2005, and a sharp increase of the urban population to around 550 million in 2005 (43% of the total population; see Figure 1.1). However, simultaneously China has been experiencing severe environmental challenges (such as ecosystem degradation, resources shortages, and pollution). Around 60% of its rivers have been polluted and 30% are with no functional use¹, over 40% of rural residents have no access to safe drinking water and only about 30% of rural toilets attain hygienic

¹ According to the China Environmental Quality Report 2006 [*Zhongguo Huanjing Zhuangkuang Gongbao*] (SEPA, 2007), only 40% of 745 monitored sections or points of surface water (593 river sections and 152 lake points) could fulfill the water quality requirements for Type III water bodies (which are suitable for drinking); 32% met for Types IV and V water bodies; and 28% were worse than Type V water bodies (which are with very limited or no functional use) in 2006. With respect to the classification of water bodies, the Surface Water Environmental Quality Standard (GB3838-2002) classifies five types of water bodies in China in terms of water quality: Type I water body refers to natural water resources and national nature reserves; Type II water body refers to Class I protection zones for drinking water sources, protection zones for valuable fish and spawning grounds; Type III water body refers to Class II protection zones for drinking water sources, general protection zones for fish and swimming area; Type IV water body refers to general industrial water zones and water recreation areas where no direct contact with humans occurs; and Type V water body refers to agricultural water zones and scenic water areas.

standards², only half of the urban domestic wastewater was treated in 2006³, and over 400 million urban residents are living with polluted air⁴. It is widely believed that the deteriorating environmental problems are related to the rapid industrialization and urbanization. In other words, China's rapid economic growth has come along with huge environmental costs. A recent controversial report of the World Bank (2007) estimates that the cost of air and water pollution (combining health and non-health factors) for China's economy comes to around \$US100 billion a year (or about 5.8% of the country's GDP).



(Source: China Statistics Yearbook 2006, at: www.stats.gov.cn)

Notes: population data are not available for the years 1979, 1981-1984, and 1986-1988

Figure 1.1 China's Economic Growth and Urbanization, 1978-2005

At present, a number of reported water pollution accidents, such as chemical spills over rivers and blue-green algae outbreak on lakes (ref. Box 1.1), have highlighted China's growing water problems.⁵ What can we do with rivers running black? As in many countries, Chinese governmental authorities have made considerable efforts to develop technologies and expand the construction of water infrastructures (including water resource system, water supply system, sewers and wastewater treatment plants)⁶. Nevertheless,

² According to the Ministry of Water Resources, at least 312 million Chinese rural residents are currently facing water shortages or have only access to unsafe water contaminated by fluorine, arsenic, high levels of salt or other organic or inorganic pollutants (Xinhua News Agency, 2006a, 2006b).

³ According to the Ministry of Construction, only 52% wastewater was treated and 42% of the cities (247 cities) have no wastewater treatment plants built yet by the end of 2006.

⁴ Outlook Weekly, 2007.

⁵ Water pollution has exacerbated and is further exacerbating China's severe water scarcity problems; as estimated by the World Bank, the overall cost of water scarcity incurred by water pollution comes to about 1% GDP (World Bank, 2007).

⁶ For instance, noticeable water projects such as the South-to-North Water Diversion Project, the Three Gorges Project, the comprehensive pollution control and ecological rehabilitation project in the Three-Rivers and Three

failures in water pollution control (e.g. Huai River⁷) have shown the limitation of a merely technological perspective for addressing Chinese water problems, as many problems reflect inappropriate management and weak implementation of environmental policies⁸.

Box 1.1 Recent Water Pollution Events Reported in China

- July 26, 2007: a lead-zinc mine runoff spilled into Zijiang River in Hunan Province, cutting off drinking water supplies to more than 200,000 people living in the riverside city of Lengshuijiang and downstream.
- In May 2007: a large outbreak of blue-green algae on Lake Tai (eastern China) has contaminated the main drinking water source of Wuxi City, cutting the tap water supply for the city's residents for almost three days. Subsequently, series of reports regarding the outbreak of blue-green algae in other regions were released, such as Cao Lake (Anhui Province, June 11 of 2007), Dian Lake (Yunnan Province, June 24 of 2007), and Guanqiao Lake (Wuhan City, July 11 of 2007).
- A report of WWF in March 2007 indicated that Yangtze River, the longest river in China, is plagued by rising pollution (weak pollution controls of riverside cities are identified as the leading factors behind the Yangtze's decline) and the current murky Yangtze River will threaten the ambitious South-to-North water transfer project.
- In the period November 2005 to April 2006, 76 water pollution accidents were reported by the Chinese governments.
- In November 2005, a chemical plant spewed about 100 tons of highly toxic chemical benzene into the river, cutting the tap water supply for Harbin City for 4 days.

(sources: various media news)

Lakes regions, and the National Western Development Project would account for a total investment of approximately US\$ 22billion in water supply and wastewater treatment infrastructure before 2013 (US Department of Commerce, 2005). In 2001-2005, China invested US\$ 2.79billion to provide 67 million people with safe drinking water (Xinhua News Agency, 2006b).

⁷ In 1994-2004, Chinese government has invested about 19.3billion RMB to address the water pollution problems of Huai River; the water quality has not been improved but deteriorating to death.

⁸ An recent OECD report – OECD Environmental Performance Reviews: China – similarly argues that the implementation of environmental policies (such as 'polluter pays' and 'user pays' principles) in China lacks environmental effectiveness and economic efficiency, bringing out the unsatisfied environmental performance in China (OECD, 2007).

Traditionally, water flows are approached primarily by natural scientists who mainly study and report information on fundamental (biogeochemical) processes in ecosystem. China has the same tradition. A rich literature has been discussing and analyzing Chinese water problems such as water resource exploitation, flood control, and pollution issues in physical or biological terms, attempting to find solutions mainly through various technical innovations, construction of (hydraulic and environmental) engineering projects, ecological assessment, and economic analysis and modeling (cf. e.g. Liu, et al., 1996; Guo and Zhao, 1999; Zhang, 1999; Wang, et al., 2000; Ma, 2004).

Since the 1970s, a new branch of sociology – environmental sociology – developed a sociological perspective and response to the emergence of environmental problems on the public agenda, coming along with the growing awareness that environmental problems are fundamentally social problems⁹. Subsequently, social scientists started to play a role and got increasingly involved in shedding light on environmental problems and the steps that need to be taken to cope with them. Topics such as institutions, governance, stakeholder participation and shared responsibilities have increasingly become popular among scholars, policymakers and other actors involved in water problems. Pertaining to the fields of governing water flows, (environmental) sociology has shown an interest and played a role in understanding the causes, impacts, and solutions of their problems. From the 1980s onwards, the paradigms of water management have shifted in the global water debates (Figuères, et al., 2003; Conca, 2006; Arts and Leroy, 2006), more and more involving socio-political considerations next to the dominant technological and economic approaches. For instance, it is argued that water should be regarded as not only a public good but also an economic good (as emphasized in the 1992 Dublin Statement and Agenda 21 concluded at the UNCED conference); that water service can be provided not only by the public but also by the private or various public-private structures (e.g. the UK water privatization of the 1980s and the related global privatization wave); and that international rivers (as transboundary river basins) require a global regime for management. Water problems, as other environmental problems, have been increasingly linked to other fields of societal concerns (such as equal distribution of costs and benefits, democracy and participation, and effective governance).

⁹ As Dunlap and Marshall (2007), three basic features can witness the environmental problems as fundamentally social problems: first, they result from human social behavior; second, they are viewed as problematic because of their impact on humans (as well as other species); and final, their solution requires societal effort.

There is still limited social science and sociological attention given to water themes and issues in China, although some Chinese scholars have been studying and discussing integrated water resource management for years (e.g. Zeng, 1999; Liu, 2004; Shen, 2003), and international organizations (cf. World Bank, 2006a, 2006b; ADB, 2005) have conducted some primary institutional studies of water management with the Chinese government. Furthermore, in the first Chinese environmental sociology conference in June of 2007, several researchers (e.g. Mol and Zhong, 2007; Chen, 2007; Lu, 2007) have attempted to link Chinese water problems to approaches, concepts and theories in the field of sociology, studying modernization, stakeholders, and institutions.

Driven by a variety of empirical observations in Chinese water sector and inspired by a series of theoretical considerations in environmental sociology and the wider environmental social sciences, this study essentially focuses on innovations and traditions in Chinese water policies and governance, with an emphasis on the urban water sectors from an institutional perspective.

1.2 Urban Water Governance in China

Urban water sectors, a crucial nodal point of the water flows, are narrowed referring to the urban water supply and wastewater treatment system in this study. The term of “urban water governance” is defined as a complicated process in which both the government and non-governmental actors (such as market actors and civil society) play roles in and share management responsibilities for (Chinese) urban water sectors. In doing so they shape new forms of urban water management (e.g. public-private-partnership), a process also coined as one from government to governance (see Kooiman’s approach for defining governance in public administration and van Kersbergen and van Waarden’s discussion of governance in the development debate; in Nuijten, 2004).¹⁰ This section briefly introduces the development of urban water infrastructures in China and the major characteristics of Chinese governance structure in water sectors.

¹⁰ Governance, as one of a key academic concepts within various disciplines (such as institutional economics, organizational studies, political science, international relations, development studies, sociology and public administration) over the past decade, does not have a definite meaning; it is often defined specially by researchers in terms of their views on the state, civil society, power and the role of policymakers (Nuijten, 2004).

1.2.1 Urban Water Sector Development in China

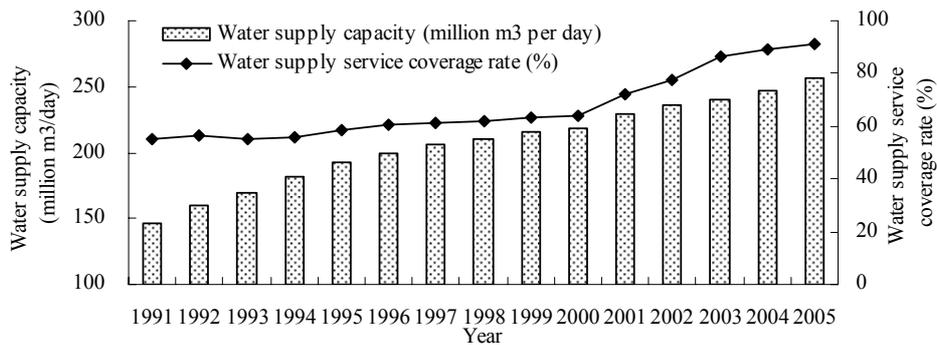
The history of water supply and its reform in China can be separated into four periods (see Fu et al., 2006). In the first period, for three decades following the creation of the Peoples' Republic of China in 1949, it was municipalities that provided water supply service, which was slowly expanded over this period. During the second period, from 1980 to 1995, in particular during the period of the 8th Five Year Plan (1991-1995)¹¹, investment in water supply infrastructure increased rapidly, bringing about an expansion of water supply services. During the third period, from the mid 1990s to 2002, the Chinese government accelerated the building of a legal framework for urban water issues after the promulgation of the *PRC Ordinance on Urban Water Supply* (No.158 Policy Paper of the State Council, 1994), and it started to emphasize the importance of economic instruments for water management (causing the first wave of increased water prices). The fourth stage of development started in 2002, symbolized by the official kick-off of marketization reform in water and other public sectors, by opening public utilities to both foreign and domestic investors.

Over the past 15 years, China has made remarkable achievement in expanding urban water supply infrastructure: the water supply service coverage increased from less than 50% in 1990 to 91% with a total water supply capacity of about 256 million cubic meters per day in 2005 (Figure 1.2).

Compared to the development of the water supply system, the urban wastewater treatment system has a shorter history. Similarly, four phases of development could be identified (Fu et al., 2006). In the first phase, which started in the 1950s and continued throughout the 1960s, only few cities built wastewater treatment plants (WWTPs) which consisted of primary treatment. From the early 1970s to the end of the 1980s, in particular following the Central Government asserting environmental protection as one of basic national policies in 1983, most provinces became concerned about waste water and requested the construction of WWTPs. However, the wastewater treatment system developed slowly due to various limitations (such as a lack of technical support and capital)

¹¹ A total investment of about 40 billion RMB counted for urban water supply service in 1991-1995, bringing out an annual increase of water provision with 9.98 million cubic meters (Fu et al, 2006).

in this second phase¹². The 1990s witnessed an eruption of various kinds of environmental pollution and problems in China. Governments were alarmed and paid increasingly attention to the control of water pollution. With the support (technical and financial) from international organizations and foreign loans, Chinese government increased the investment in expanding wastewater treatment services, leading to an increase of the number of WWTPs, to around 200 in the end 1990s.



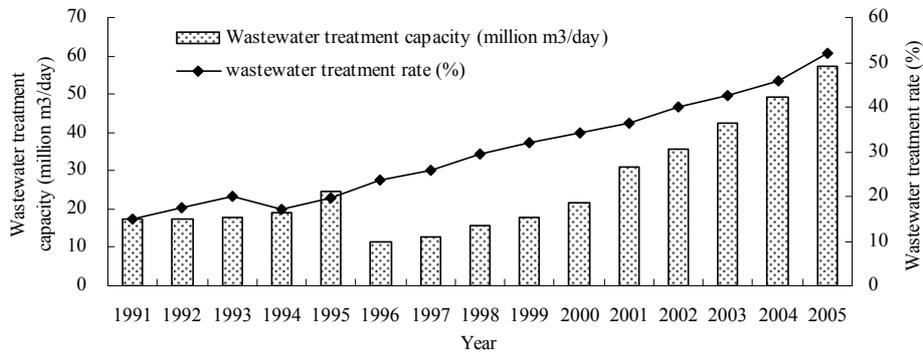
(Source: MOC, China Urban Construction Statistics Yearbook, 2005)

Figure 1.2 Water Supply Capacities in China, 1991-2005

The recent fourth phase of development began from the start of this millennium, accompanied with the marketization reform in public sectors. Over the past 15 years, China has reached a remarkable achievement in the wastewater treatment sector although the current capacity is still far from adequate given China's serious water pollution: the wastewater treatment rate increased from less than 15% in 1990 to 52% in 2005, with 792 built wastewater treatment plants and a total wastewater treatment capacity of about 57 million m³ per day (Figure 1.3). Obviously, the pollutant loads (industrial and municipal) have decreased due to municipal and industrial wastewater pollution control. However, China is still facing significant surface water quality problems following industrial,

¹² In the end of 1980s, a total of 78 WWTPs were built in Chinese cities.

domestic and agriculture pollution. In addition, safe drinking water problems in the rapidly growing urban centers as well as in rural areas have remained.



(Source: MOC, China Urban Construction Statistics Yearbook, 2005)

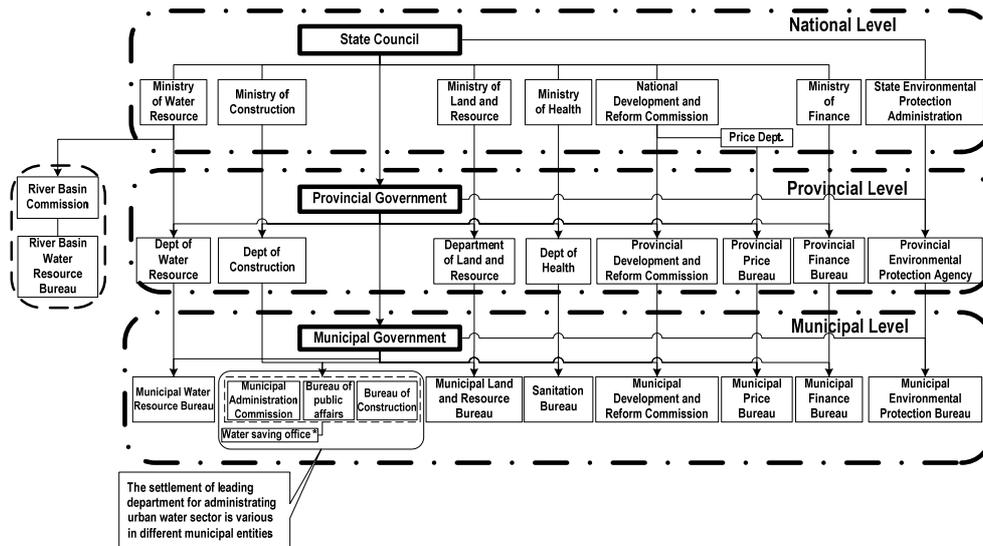
Figure 1.3 Wastewater Treatment Capacities in China, 1991-2005

1.2.2 Government Organizations for the Urban Water Sector in China

In China, there are four layers of government administration, and a set of parallel government agencies at each level for water management (see Box 1.2 and Figure 1.4). Each agency reports both to their political leaders at the same level, as well the agencies above them. And each agency monitors agencies below them.

Box 1.2 China's Administrative System

In China, the governance structure is a hierarchical and decentralized system in which functional responsibilities are delegated through a four-tiered system: 1) central level; 2) provincial level (which is administered through 23 provinces, 5 autonomous regions, 4 municipalities directly under the central government; excluding 2 Special Administrative Regions i.e. Hong Kong and Macao which have different institutional structure for water management); 3) municipal level; and 4) county level.



Note: The municipal-level authorities of construction (the branches of MOC) vary in cities. In general, 1 to 3 municipal agencies can be established under the monitoring of provincial construction department following local needs.

(Source: author)

Figure 1.4 Hierarchical Government Administrations for Water Management in China

Various ministries and commissions have been involved in Chinese water management with different responsibilities (ref. Table 1.1), shaping a fragmented governance structure. This has been argued to be one of the main reasons for the inefficient and ineffective water management. The Ministry of Construction MOC is the leading national government agency responsible for public utility development and management.¹³

¹³ Since 1990s MOWR has called for establishing an integral water authority at local (provincial, municipal and county) levels to integrate the water affairs, which have been divided in various government organs since long. According to Mr. Hu Siyi, the Vice Minister of the MOWR, a total of 1413 integral water authorities had been established at various levels by (May of) 2006, equaling 58% of total administrative entities above county level (speech at the National Water Resource Management Workshop, InterMongolia, May 28 of 2006, in: http://www.shuiziyuan.mwr.gov.cn/viewPubPage/frm_det.aspx?CNM=领导讲话&CID=1&ID=1190).

Table 1.1 Major National Organizations in China's Water Management

Organization	Abbreviation	Water responsibilities
Ministry of Water Resources	MOWR	Responsible for water resource management and hydro-affairs, including constructing and protecting hydro-engineering projects, licensing and charging water resource fee
Ministry of Construction	MOC	Control and construction of municipal water supply systems, water saving, urban flood control, water use planning, as well as construction and administration of municipal wastewater treatment facilities
Ministry of Land Resources	MOLR	Supervises the protection of groundwater resources and the exploration of the groundwater resources
Ministry of Health	MOH	Responsibilities with respect to formulating and enforcing National Drinking Water Quality Standards
National Development and Reform Commission	NDRC (former NDPC)	Responsibilities with respect to macro economic policies and investment planning
Ministry of Finance	MOF	Responsibilities with respect to the government budget and investments
State Environmental Protection Administration	SEPA	Regulates water pollution control by formulating standards for surface water quality and pollutant discharge, making the environmental planning, and monitoring environmental performance of enterprises.
State-owned Assets Supervision and Administration Commission	SASAC	Takes charge of the state-owned assets with the intention of separating assets management from the day-to-day enterprise management. The role of SASAC in relation to local government is in transitional phase and is less clear as its normative functions in water and wastewater sector.

The relations between the centre and the localities reflect the Chinese fiscal system, which is highly decentralized.¹⁴ It is municipal governments that are primarily responsible for ensuring adequate financing for their public utilities (such as water supply and wastewater treatment). In general, the municipal agencies (i.e. the municipal construction bureau/commission) take policy guidance of provincial and national agencies (only the national and provincial agencies have power to set policies, guidelines, and standards for urban public utility services). They are also heavily influenced by the municipal governments' priorities and directives.

1.2.3 Reform in the Water Services Enterprises

Traditionally, the water services enterprises in China were all in public hands and operated as government utilities. In that sense, the competent authorities (mainly referring to the municipal construction bureau/commission) took all responsibilities for water services, such as financing and investment, manager appointment, operation and production affairs.

As the reform of State-owned Enterprises (SOEs) is an important component of Chinese economy reform – moving to a more market-influenced economy – since the late 1970s onwards, the government started to call for establishing modern enterprise systems in the water supply sector in the 1990s¹⁵. This institutional reform of water SOEs can be regarded as the liberalization and commercialization of the provision of water services (cf. Figure 1.5); which is still ongoing and facilitated in particular since 2002, when the government requested to move the marketization reform into public utility sectors (including water sectors) and open the market to (foreign and domestic) private investors.

¹⁴ There are now three sets of taxes in China. Central taxes include items such as customs duties, income (personal and institutional) and consumption taxes, and profit remittances from central enterprises. Secondly, there are the central-local shared taxes; the most important revenue streams include VAT (75% for the centre and 25% for the localities), resource taxes (100% of offshore oil to the centre, other resource taxes to the localities) and securities' trading stamp tax. Thirdly, there are the local taxes that include business taxes and income taxes from local enterprises that do not fall into the first category, individual income taxes, urban land-use tax, property and vehicle tax, stamp duty and agriculture and husbandry taxes (Saich, 2004:169).

¹⁵ August 27 of 1993, the MOC promulgated the *Administrative Method on Transforming Operation Mechanisms of Enterprises Owned by the Whole People [Quanmin Suoyouzhij] of Urban Water Supply, Gas Supply and Heat Supply* (No.631 Regulation Policy Paper of the MOC [*Jian Fa Zi 631*], 1993) to conduct the SOEs reform in the field of urban water supply sector.

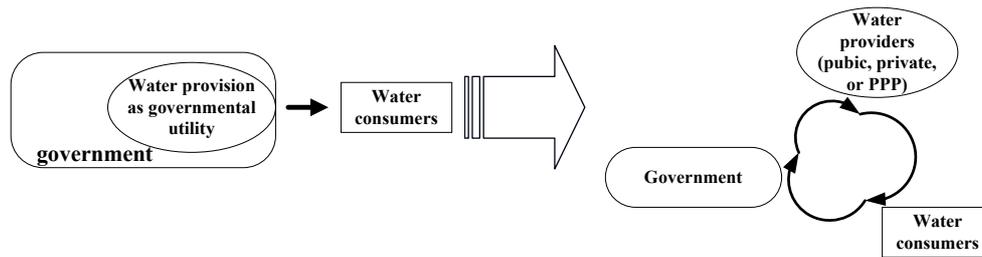


Figure 1.5 Liberalization and Commercialization of Water Service Providers

As shown in Figure 1.5, there is a separation of state and market (or of the execution and the regulation/control of water service) in the urban water sector, bringing about new defined roles of government and non-governmental actors (such as service providers and water consumers) and a new formulated structure of urban water governance. With increasing acceptance of the role of the market in the provision of water services, a demand for cost recovery rather than highly subsidized provision, and an increasing space for civil society to operate, the water sector is changing dramatically in China. All these changes need an interpretation from an institutional perspective. But it is an interpretation of processes that are unfolding and taking shape, rather than that of a well-crystallized structure that operates and functions in a stable way.

1.3 Research Questions

As illustrated in previous sectors, China is facing severe environmental challenges for water. At the same time the central planned economy is developing into a market-oriented economy. This renders the institutional structures for governing the urban water problems into a state of large flux. The central research question of this thesis essentially deals with trying to understand and assess the innovation and stability of contemporary institutions in Chinese urban water governance. In doing so, this thesis requires an analytic framework to understand and theorize the institutional changes taking place in Chinese urban water sector, for which the Western-stemmed ecological modernization theory is adopted.

To focus the research objective, this thesis focuses on three recent and major institutional reforms in urban water governance: pricing and economic policies, private sector involvement, and the emergence of public participation in policy-making process. Four main sub-questions organize the study:

- How can we understand and interpret the conventional institutions in China's urban water governance, and their innovation and reform?
- How are water policies implemented at the local level in China? What are the reasons behind differences in policy implementation between provinces?
- To what extent are these institutional changes successful in combating problems of Chinese urban water governance?
- What can we learn from the institutional changes of Chinese urban water governance for the further development of Ecological Modernization theory in China?

1.4 Structure of Thesis

This thesis contains seven chapters. The following Chapter 2 contains the theoretical part of this thesis, offering a theoretical elaboration on the role of institutional changes for modernizing urban water governance from an ecological modernization perspective.

In between the theoretical and empirical part of the thesis, a brief methodological intermezzo is developed, elaborating on the choice for a combination of large scale surveys with case-study research as a means to do theoretical and explorative research. Discussion is also made for the methods used for data collection.

The empirical part of the thesis starts in Chapter 3. Following the insight that economic and pricing approaches are an essential addition to conventional command-and-control environmental regulation, China has gradually increased attention to, research on and experiments with the application of economic instruments in urban water management. Chapter 3 analyzes the actual application and implementation of economic instruments in Chinese urban water sectors.

Chapters 4 and 5 address the developments of public private partnership (PPP) and the new formulated governance structure in China's urban water sectors. In analyzing and interpreting the further private sector involvement in Chinese urban water sector as a part of modernization of urban water governance, Chapter 4 provides a country-wide overview of current PPP development in China and makes an in-depth investigation in three distinct cases concerning new roles of governments and private sectors. In Chapter 5, a quantitative model is developed, specialized in the wastewater treatment sector. It analyzes the dependence of private investment on the sale of public investment at different rate level of wastewater treatment charge, as well as the impact of tax policies.

Chapter 6 analyzes the emergence, development and current functioning of public hearings in water tariff setting, and assesses to what extent public hearings are part of a turning point in Chinese traditional centralized bureaucratic decision-making, towards more transparent, decentralized and participative governance.

In the concluding Chapter 7, the findings of the empirical part are brought together to answer the research questions within the developed theoretical framework. This final section also includes implications for the future research agenda of urban water governance.

Chapter 2 Modernizing Urban Water Governance in Transitional China

2.1 Introduction

This study deals with tradition and innovation in Chinese urban water policies from an institutional perspective. The institutional innovations in Chinese urban water sector change the relations between governments, market actors, and civil society, and lead to the emergence of new modes of urban water governance. This process can be labeled the modernization of Chinese urban water governance. This chapter aims at developing a theoretical framework within which these institutional changes can be discussed and interpreted. In doing so, Ecological Modernization theory is taken as the principal theoretical foundation for developing such a framework.

As one of the leading sociological theories on environmental issues and environment-induced changes, Ecological Modernization theory, developed in the industrialized countries in north-western Europe (most notably Germany, the Netherlands and the UK) in the 1980s (Mol, 1995). It has matured and spread in quite different ways, for instance, at different levels (e.g. local, national and global), within different regions (e.g. developed and developing), in different practices (e.g. production and consumption, environmental movements), and with respect to different actors (e.g. government, commercial actors, civil society, NGOs).

The following section provides the general background to Ecological Modernization theory (its development, the core principles, and the relevant scholars) from a historical perspective. The emergence and development of Ecological Modernization in China is summarized in Section 2.3. Finally, a model for analyzing urban water governance in transitional China is developed in Section 2.4 based upon the basic framework and core principles of the Ecological Modernization theory.

2.2 Ecological Modernization Theory: A Historical Perspective

Firstly coined in German language by Joseph Huber (1982, 1985) in the 1980s, Ecological Modernization theory has matured as one of the dominant social theories on environmental change. The basic premise of Ecological Modernization theory emphasizes the centripetal movement of ecological interests, ideas and considerations in the social practices and institutional developments of modern societies. According to Ecological Modernization theory, two key mechanisms for environmental reform are technological change and the internalization of external cost (often referred to as the “ecologizing of the economy” and the “economizing of the ecology”, respectively; cf. Mol, 1995; Spaargaren, 2000).

A great number of studies have been discussing the origin, development, principles, and schools of Ecological Modernization theory and its critiques at different stages (see Mol, 1995; Mol and Sonnenfeld, 2000; Hannigan, 2006:22-33). From its earlier lynchpin of arguments involving technological innovation to the current globalization-based and information-governing debates on environmental changes, Ecological Modernization theory has been modified over the years. Three major development stages of Ecological Modernization theory can be identified.

The first phase of Ecological Modernization theory (during the 1980s) can be understood as a social science interpretation of how industrialized countries deal with the environmental crisis. It originally presented a complex understanding of the emergence of a post-industrial society, arguing that environmental problems can best be resolved through further advancement of technology. Thus, this early Ecological Modernization theory was characterized by a heavy emphasis on the role of science and technological innovation in environmental reform, especially in the sphere of industrial production (see Spaargaren and Mol, 1992; Mol, 1995; Mol and Sonnenfeld, 2000; van den Burg, 2006). As a technocratic, optimistic theory, it often generated questions and criticisms, among which many were rooted in two dominant schools of thoughts of the 1970s: the counter-productivity or deindustrialization theorists and the neo-Marxists. These critics pointed at the fact that the way to deal with the ecological crisis is through stopping the process of industrialization and/or capitalism, respectively, rather than through making use of industrial technologies and the capitalist market economy (Fisher and Freudenburg, 2001; for fuller discussion of the debate of neo-Marxists versus Ecological Modernizationists, see especially Mol and

Spaargaren 2000, 2005). This early Ecological Modernization theory was criticized as “too good to be true” (see Giddens, 1998:57, as cited in Fisher and Freudenburg, 2001).

From the late 1980s to the mid 1990s, the second stage of Ecological Modernization theory focused increasingly on the role of state and market dynamics in ecological transformation processes, while reducing the emphasis on technological innovation as the sole motor behind ecological restructuring (cf. Weale, 1992; Jänicke, 1991; Mol and Sonnenfeld, 2000). As Mol summarized, “during this phase, the institutional and cultural dynamics of Ecological Modernization were given more weight, as well as the role of human agency in environment-induced social transformation” (Mol, 2001:58; see also Hajer, 1995; Spaargaren and Mol, 1992; Cohen, 1997; Mol, 2000). Over this period, Ecological Modernization theory has been linked to other social theories such as structuration theory (Giddens, 1984, 1990), risk society theory (Beck, 1992), and reflexive modernization theory (Beck, 1994). The work of these related theories has contributed to a further refinement of Ecological Modernization theory (see van den Burg, 2006: 26-27). Simultaneously, critiques on Ecological Modernization theory changed somewhat in nature and most of those started to come from post-modernists (e.g. controversy on the materiality of environmental problems), eco-centrists (e.g. debates between radicalism versus reformism), and neo-Marxists (stressing that notions of power and inequality remain under-theorized) (cf. Mol and Spaargaren, 2000; van den Burg, 2006).

Recently, from the mid 1990s onwards, Ecological Modernization theory has witnessed a proliferation of research in various contexts. On the one hand, challenged by the global dynamics, the emergent sociology of flows and the work on the information age, Ecological Modernization theory has been updated in order to better interpret new debates between globalization and environmental reform (see Mol, 2000; Sonnenfeld and Mol, 2002; Mol and van den Burg, 2004; Mol, 2006a; van den Burg, 2006). More recent work of Spaargaren and van Vliet (2000) on transformations in the infrastructure and practices of consumption, the analyses of Murphy and Gouldson (2000) on industrial innovation, and van den Burg (2006) on informational governance has broadened the scope of Ecological Modernization theory. On the other hand, national studies spread from West-European countries to other regions such as non-Western European nation-states in e.g. sub-Saharan Africa (Frijns et al., 1997), and South-East Asia (e.g. Zhang, 2002; Phuong, 2002; Choy, 2007). As a consequence, the Ecological Modernization theory to date has been argued to

have three broad perspectives in common: “(i) moving beyond apocalyptic orientations to see environmental problems as challenges for social, technical and economic reform, rather than as immutable consequences of industrialization; (ii) emphasizing transformation of core social institutions of modernity – be it not beyond recognition – including science and technology, production and consumption, politics and governance, and the ‘market’, on multiple scales (local, national, and global); and (iii) positioning in the academic field distinct from counter-productivity (or deindustrialization), post-modernist (or strong social constructionist), and many neo-Marxist analyses” (Mol and Sonnenfeld, 2000:5).

Having described in brief the historical development of Ecological Modernization theory and its major critiques at different stages, I now turn to the key themes of Ecological Modernization theory, which various Ecological Modernization scholars have elaborated upon regarding environmental transformations. Five basic characteristics have been highlighted within Ecological Modernization studies, in particular:

(1) A pivotal role of science and technological change in ecology-induced transformations

In the Ecological Modernization paradigm, science and technological innovation can play a positive and pivotal role in environmental/ecological-induced reform. First, although some theorists in deindustrialization, counter-productivity and neo-Marxist schools-of-thought (e.g. Foster, O’Connor, Schnaiberg, and Gould; cf. Fisher and Freudenburg, 2001) have argued that technologies are the cause of environmental problems, environmental technologies have proved also to contribute to the reduction of pollution levels during the 1980s and 1990s, witnessing their actual and potential role in curing and preventing environmental problems. At the same time and secondly, in the contemporary world the traditional curative and repair technologies and options (e.g. end-of-pipe technologies) are being replaced by more and more preventive socio-technological approaches and systems that incorporate environmental considerations at the design stage of technological and organizational innovations, further witnessing the positive contribution of science and technology to address environmental problems.

(2) The increasing importance of economic and market dynamics and economic agents within environmental reform

According to the theory of Ecological Modernization, the state is no longer the sole actor that promotes environmental protection; private economic actors and market mechanisms play an increasingly important role. Within this process, numerous economic instruments (pricing, eco-taxes, levies, deposit-and-return systems) have been applied in pushing for environmental goals. Economic actors, such as producers, customers, consumers, credit institutions, insurance companies, the utility sector, and business associations have increasingly turned into social carriers of ecological restructuring and reform (rather than only being polluters). And various forms of public-private constructions and arrangements have been formulated, creating shared responsibilities between the state and economic actors for environmental protection and attempting to find solutions to environmental issues through these new constructions.

(3) The transformations of the role of the nation-state in environmental reforms

For a long time, the state has been assumed to be the principal actor in environmental protection (labelled as ‘environmental state’, cf. Mol and Buttel, 2002; Mol and Spaargaren, 2002), due to the perception that environmental quality is a common or public good. Initially, the ‘environmental state’ has been argued to have limited capacities and success of governing natural resources and environmental protection, bringing about a call “for more rather than less state activity and intervention in the economic process of investment, production, and even consumption” (as Mol and Buttel, 2002:2). Since its origin and development, the Ecological Modernization theory has analyzed the role of the nation-state in environment-induced transformation. In Ecological Modernization theory, the focus has shifted away from the debate on more or less state, towards the modes of state ‘intervention’. The ‘environmental state’ still plays a key role in process of environmental institutionalization but through different modes. First, the conventional top-down, centralized, hierarchical, command-and-control governmental regulation is shifting towards a trend of more decentralized, flexible and consensual styles of governance. Second, non-governmental actors (such as the private economic sector but also civil society actors) are playing an increasingly important role and are sharing the conventional tasks (in

provision of public goods and environmental services) of the nation-state. Third, globalization and the emergence of international institutions are changing the sovereign role of nation-states in environmental reform to some extent. All these changes are often referred to as “political modernization”. For recent studies that point out the linkage between Ecological Modernization and political modernization, see, e.g. Leroy and van Tatenhove (2000), Mol (2002), and van Tatenhove and Leroy (2003).

(4) A modified role of civil society and environmental NGOs in the process of ecological transformation

In the 1970s and 1980s, the role of social movements in environmental reform has remained limited to the periphery or outside the (public and private) decision-making processes. But the 1990s witnessed a change in environmental NGOs in three perspectives, according to Ecological Modernization scholars (Mol, 2000): (i) changing ideologies that prevail in the movement: the mainstream ideologies of the 1970s that were against the capitalist economic system, against major industrialization and large or complex techno-systems, and against any form of large bureaucracy have changed dramatically although they can still be found in parts of the ideological spectrum of the environmental movement; (ii) modifications in the position of environmental organizations vis-à-vis other actors: environmental NGOs have developed into one-issue organizations, with a stricter focus on environmental quality. At the same time they are losing their monopoly on environmental agenda setting and the representation of environmental interests; and (iii) transformations in the strategic operations of NGOs between state and market: instead of being on the periphery or even outside the central decision-making institutions, environmental civil society organizations seem increasingly involved in decision-making processes within the state and, to a lesser extent, the market.

(5) Changing discursive practices and emerging new ideologies

Finally a change has taken place in the dominant (environmental) ideologies. In the current environmental debates “both the fundamental counterpositioning of economic and environmental interests as well as a complete neglect of the importance of environmental

considerations, are no longer accepted as legitimate positions” (Mol, 2000:46). Although there is often a gap between ideology and practice, environmental arguments have become a solid part of (governmental and market) decision-making practices, be it in different ways to a different extent in various domains and geographies.

2.3 Ecological Modernization Theory in China

As mentioned previously, over the recent decade the Western Ecological Modernization theory has also spread to other geographical areas with different political, cultural and economic contexts, such as Thailand (see Wattanapinyo, 2006), Viet Nam (see Phuong, 2002, My Dieu, 2003, Khoa, 2006) and Malaysia (see Choy, 2007). This section provides a brief review of the conceptualization and current development of the Ecological Modernization theory in China.

As early as the start of this millennium, several Chinese academics have studied and applied ideas, models and theories of Ecological Modernization. For instance, Huang and Ye (2001), He and Wu (2001), and Zeng (2004) introduced the concept of Ecological Modernization to China and reviewed its historical development and key principles in Chinese language. Zhang (2002) applied this theory to interpret the environmental management towards Township & Village Enterprises (TVEs) in China in her PhD dissertation. Liu (2005) developed a comprehensive research approach for the Chinese societal phosphorus cycles within an Ecological Modernization perspective. And Han (2006) is studying the Chinese environmental auditing and renewable energy policies under the framework of the Ecological Modernization theory. In the meantime, some Western scholars have discussed Ecological Modernization dynamics in China (e.g. Mol, 2006b), focusing on issues such as economic approaches to environmental governance, technical innovation and environmental regulation, public participation and environmental NGOs, and globalization. In April 2006, a special issue on ‘Environmental Governance in China’ (*Environmental Politics*, 2006) gathered work of several researchers (both international and domestic) with a focus on the institutional dynamics in environmental governance that China is witnessing today. Loosely applying the theory of Ecological Modernization, this special issue dealt with the institutional changes in the economy, in the political-administrative system and in civil society, and assessed the actual transitions in

environmental governance in four sectors (watersheds, energy, industrial transformation, and genetic modification).

In short, current academic research has entered the question on the relevance of the Ecological Modernization theory for China, but Ecological Modernization has had limited influence in Chinese political, societal and academic domains. This might change soon. On 27 January 2007, an officially released 450-page report – the ‘China Modernization Report 2007: Study on Ecological Modernization’ – by the China Centre for Modernization Research (2007) officially introduced the concept, ideas, and scholarly literature around Ecological Modernization in China and enjoyed large scale media and public attention, both in China and around the world. It is obviously not the first introduction of Ecological Modernization in China. But, as an authoritative report, its broad influence (in particular the communication to the Chinese government) has an important contribution to the conceptualization and proliferation of Ecological Modernization in China.

Given that China has a long history of ‘modernization discourse’ since the New China was founded¹⁶, this report can be seen as a timely effort to insert ecological rationality into the modernization discourse, policymaking, and practices in China (see Zhang et al., 2007, for a review). Except providing an extensive introduction to the history, core principles, developments and analytical methods of the Ecological Modernization theory as it was developed in Europe (reflecting on issues such as dematerialization, the ecologizing of the economy, decoupling, prevention, clean technology), this report also emphasized a few remarkable new things, as well as several ‘omissions’.

In comparison with the recent Western literature on Ecological Modernisation, this report is following a primarily economic-technological analysis of environmental improvement, with a focus on China’s major production sectors. It understands technological innovations and economic dynamics as key to Ecological Modernization – which were also the key features of the first-phase of Ecological Modernization theory (see previous section). However, political innovations in the Ecological Modernization literature (such as political modernization, subpolitics, and the reinvention of environmental

¹⁶ As a century-old dream of the Chinese people, modernization was mainly related to ‘catching-up’ with developed countries and served to push for extraordinary economic growth in the earlier stage. Along with the ideological change towards (sustainable) development and the deteriorated environment in China, the official definition of modernization in China has included the environmental domain more recently, especially with this report.

governance) are hardly referred to in this 2007 report, while there is also limited attention to civil society participation (such as the role of environmental NGOs and the influence of citizen-consumers). Both have increasingly dominated in the Western Ecological Modernization literature in the recent decade. Thus, one can classify this report as belonging to the first – rather than third – phase of Ecological Modernisation scholarship, i.e. that focusing on technological innovation and economic institutions, rather than on consumption, participation and governance (Mol and Sonnenfeld, 2000, pp. 4-5). Or alternatively, one can classify this report as a weak version of Ecological Modernisation (cf. Christoff, 1996).

In line with the various attempts to use Ecological Modernization ideas and frameworks in understanding environment-induced social transformations in China, I will develop in the next section an Ecological Modernization-based framework for studying transformations in the urban water sector. But distinct from the 2007 China Modernization Report, the main emphasis in this study – and consequently in the developed framework – is not on technological change but rather on institutional transitions in relation to improved environmental performances.

2.4 Modernizing Urban Water Governance for China

Ecological Modernization theory has been successfully utilized to study various specific productive sectors in diverse policy contexts: for instance, the Dutch chemical industry (Mol, 1995), the Kenyan small-scale metal industries (Frijns et al., 1997), the Vietnamese rubber and shoe industries (Nguyen Phuc Quoc, 1999), the Vietnamese food industries (My Dieu, 2003), the Thai agro-industry (Wattanapinyo, 2006), and the Dutch network-bound utility systems (both water and electricity provision; van Vliet, 2002). Now the question is, on the one side, whether the theory is also helpful in studying environmental reform of urban water sectors (both water supply provision and wastewater treatment) within China's transitional economy; on the other side, can empirical findings of institutional changes within the Chinese urban water sector contribute to the further development of the Ecological Modernization theory in China. In the remainder of this chapter, I will further introduce and discuss the core theoretical framework for investigating the modernization of China's urban water system into more sustainable directions. I start, in the next section, by

clarifying two basic concepts ('water institutions' and 'urban water governance') within the context of this study.

2.4.1 Water Institutions and Urban Water Governance

'Institution' is a popular term in research domains such as public administration, policy studies, political science and sociology. It has no single, universally accepted definition to date. The literature has provided various definitions of institutions, according to specific research interests. Some consider institutions as general rules of society. For instance, Ruttan and Hayami (1984: 203) view "institutions (as) the rules of a society or of organizations that facilitate coordination among people by helping them form expectations which each person can reasonably hold in dealing with others". North defines institutions as "rules, enforcement characteristics of rules, and norms of behavior that structure repeated human interaction" (North, 1989: 1321). Andrew Schotter (1981: 155) specifies that 'social institutions' "are not rules of the game but rather the alternative equilibrium standards of behavior or conventions of behavior that evolve from a given game described by its rules. In other words, for us, institutions are properties of the equilibrium of games and not properties of the game's description. We care about what the agents do with the rules of the game, not what the rules are". Some view institutions as a substitute for the term 'political structure', emphasizing the attributes of the political system such as size, degree of competition, extent of overlap and other attributes (cf. Ostrom, 1986).

In this thesis, I do not try to deal with the debate regarding *which* of the definitions of institution is the 'right definition'. Instead, for the purpose of this study, I specify the term 'water institutions' as the system of rules, decision-making procedure, and programs that help people deal with urban water issues, assign roles to participate in water governance practices, and guide interactions among the relevant actors. In this sense, the arrangement of (urban) water institutions is an essential part of 'urban water governance'.

Following the research questions introduced in the previous chapter, this thesis aims to deal with the institutional transformation in urban water governance in transitional China. In other words, it is resolving the question what and how new forms of governance are established for the Chinese urban water sector under the conditions of a transitional

economy. Like with the term ‘institution’, there is also no single model or definition for (effective or good) governance. Most authors in the area of governance studies make a clear distinction between government, related to conventional steering actions of state authorities, and governance as a wider system of steering involving multiple agents, resources, strategies and levels. Hall (2007) argues that seven basic principles should be considered in any form of effective governance: (i) institutions should work in an open and transparent manner; (ii) institutions should be inclusive and communicative; (iii) policies and actions must be coherent; (iv) governance systems must be equitable; (v) accountability is critical to good governance; (vi) a governance system must be efficient; and (vii) governance systems must be responsive and sustainable.

Water governance should than be understood as decisions, programs and actions related not only to resource allocation and utilization, or to the economic dimensions of water related to growth and development; but also involving ethical/normative and political decisions and dimensions regarding water as a common good (or, according to some, as a basic human right) that should be available for all people. This involves issues and debates on water and poverty, water and democracy, and water and social equity. As such ‘urban water governance’ within this study includes the current hotly debated water issues in China, such as market and price dynamics, privatization and globalization of water service provision, decentralization and deregulation, and the increasing role of civil society in the governmental decision-making process. In all these debates the changing roles, responsibilities and interactions between various stakeholders involved in water governance take a central place, with a central focus on the lost monopoly of conventional state authorities and institutions.

2.4.2 Ecological Modernization of Urban Water Governance

It has been commonly recognized that the process of developing a good (urban water) governance system is a time-costing one and there is no single mode for it. In exploring the kinds of institutional arrangements that are being developed in the contemporary China for creating ‘good’ urban water governance, we can thus not take existing Western institutional arrangements as a yardstick against which Chinese developments can be ‘measured’ or assessed. But Western Ecological Modernization theory can guide our analysis of the kind

or dimensions of institutional innovations for better water governance, which can be (and are being) developed.

Figure 2.1 captures the basic crucial development in urban water governance as can be hypothesized from Ecological Modernization theory. While initially the urban water sector was predominantly governed by state authorities, or governmental organizations at various levels, following Ecological Modernization ideas this governance is diversified and has changed. This fundamental transition can also be hypothesized for China, be it that the exact ways and modes of urban water governance – and thus the roles, tasks and responsibilities of the various actors – can be quite distinct from Western models. The specific political, economic and cultural circumstances of China make that Chinese Ecological Modernization dynamics will only partly reflect those in Western Europe. But this framework helps us to look for institutional innovations in urban water governance in three domains: state (or government), economy (or economic actors) and civil society (or citizens and NGOs).

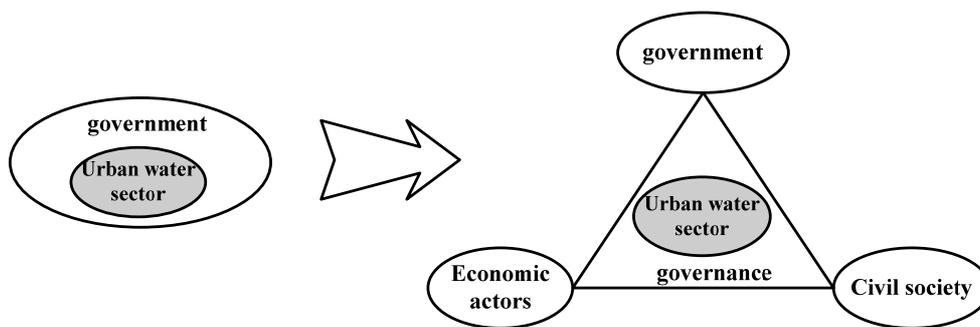
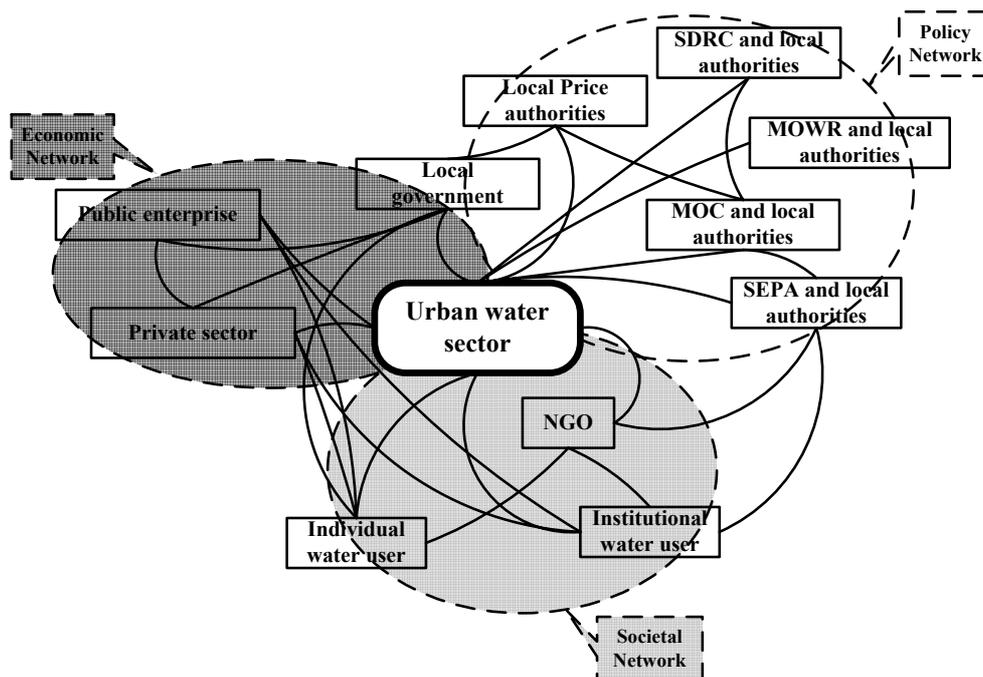


Figure 2.1 Government to Governance for Urban Water Sector

This basic scheme can be further operationalized to make it useful for empirical research, as is reflected in Figure 2.2. For each of the three domains, the relevant actor networks are indicatively mentioned, as well as the relations between these actors (together sometimes indicated as actor-networks). As such we see three interdependent networks: a political-administrative or policy network, an economic network and a socio-cultural or

societal network. Each of the three networks consists of a specific set of actors which interact with specific resources and following specific 'rules of the game'. Such a model, also elsewhere mentioned as a triad-network model and used in Ecological Modernization type of studies (cf. My Dieu, 2003; Mol 1995), is most adequate for institutional analyses, as it combines a system perspective (of the three main subsystems) with an actor perspective (actor-networks). The model helps us to analyze the major actors (the state and non-state actors) that are playing roles in Chinese urban water governance and their roles, relations and rules of the game they are confronted with and help to change. Below, this theoretical framework regarding Chinese urban water governance is further elaborated to hypothesized three types of institutional transformations in Chinese urban water governance, from an Ecological Modernization perspective. But one additional clarification needs to be made first.

In focusing on these three main domains and actor-networks for exploring institutional innovations in Chinese urban water governance this study does not explore the contribution of scientific and technological developments, as is hypothesized by Ecological Modernization theory (see section 2.2). This doesn't mean, however, that the role of science and technological innovation in the field of urban water sector reform in China is marginal. In fact, more and more water-saving devices and technologies have been invented and are adopted in the daily production, consumption and treatment of water in China. This also contributes to a decrease in both resource consumption and pollutant production (per capita or per unit of GDP), and to major technological innovations in the field of wastewater treatment to improve the efficiency and capacity of water pollution control. Various other studies have focused on the significant innovations in science and technology in China's water sector (e.g. a recent study on technological innovations for industrial water conservation: Du, 2006; numerous discussions on technological solutions for water/wastewater treatment in Chinese influential journals such as *Chinese Water & Wastewater*, *Water & Wastewater Engineering*, *China Environmental Science*, etc.). This is less the case with respect to (other) institutional innovations. Thus, our focus on institutional rather than technological innovations is not born from an idea that the latter are more important than the former, but rather that the latter are less studied than the former.



NDRC: National Development and Reform Commission; MOWR: Ministry of Water Resource; MOC: Ministry of Construction; SEPA: State Environmental Protection Administration

Figure 2.2 Major Actors and Their Relations in Urban Water Sector Governance

(1) The increasing importance of economic and market dynamics in urban water sector

As water is still commonly perceived as a public good to which everyone should have a right of access, economic approaches to water (whether it is in the form of pricing of water (services) or strong private sector involvement in water/wastewater service provision) continue to be controversial and hotly debated today. At the same time, economic approaches are increasingly seen as at least part of a solution for the various water challenges modern societies are confronted with. And over the past two decades economic and market dynamics have been playing increasing roles in water sectors globally, as theorized upon by, among others, Ecological Modernization scholars (cf. van Vliet, 2002).

Although the hey-days of full privatization in urban water sectors seems to be over, and there is growing conviction that the state needs to remain involved more than marginally in water provisioning, the participation of the private sector in water governance system continues to be seen as a way to overcome governmental failure in resource allocation and low efficient and low effective public provision of water services (see, e.g. Hall, 2007; Conca, 2006). In addition to the privatization debate on water sectors, numerous economic instruments (such as cost-covering price, green taxes, pollution levies) have been developed and applied in pushing for the goals of protecting water resources and controlling water pollution, in particular after the promulgation of Agenda 21 and the 1992 Dublin Statement. Both influential documents claimed that water should not be regarded as only a public good, but also as an economic good and emphasized the importance of economic dynamics in water governance.

With respect to China, both the development of economic instruments and private sector involvement in water service provision lags behind other (OECD) countries, but both have become subject of debate within the current reforms of the Chinese urban water sector. As a late comer in these fields, it is obviously that China can learn from experiences and lessons from other forerunners, for instance with respect to the limits and problems of full privatization of the water sector. And it is also understandable that these (pricing and privatizing) policies and developments (will) have a different outlook and performance in China due to the different political, economic, and social contexts. But the commonality seems to lie in the development that conventional fully government managed Chinese urban water sectors are being replaced by new modes of governance where the economic incentives (such as cost recovery), economic actors (such as private investors), and market dynamics (such as the market competition) play substantial roles. In Chapters 3 and 4, the emergence and functions of economic actors and dynamics in current Chinese urban water governance are analyzed, with a focus on pricing policies and private sector participation. With that, these chapters try to grasp how and to what extent economic institutions, actors and dynamics play a role in the current management of water.

(2) Transformations in the role of the nation-state in urban water sector governance

It is without question that the state has been - and still is - dominant in the urban water sector. The public goods character and social functions of water, the close relation between the level of water infrastructure and urban/economic development, the high capital intensity, sunk costs and risks involved with water systems, and the multi-purpose and interconnected nature of water resources are at the foundation of this dominant role of the state in the water sector (see also Rees, 1998).

But also in China conventional government-owned and managed urban water sectors have been seen as hopelessly overstaffed, inefficient and incapable of providing even basic service to the growing (urban) population. A (partly) transfer of traditional governmental tasks (such as finance and investment, operation and execution) to private actors has characterized the wave of privatization and deregulation from the 1980s onwards (cf. World Bank, 2004; Pongsiri, 2002; Rees, 1998). But following the growing criticism of the privatization and deregulation experiments in water governance, a rich recent literature has been debating new paradigms in water management, where dialogues, partnerships and participation between the state and non-state actors are central. For instance, *Rethinking Water Management: Innovative Approaches to Contemporary Issues* (Figuères et al., 2003) discusses new paradigms in water management such as economic instruments (e.g. tradable water right, cost-recovery price), the impact of globalization on local water management, privatization of water services and the state-market relations, and the role of the sovereign state within transboundary water management. Conca (2006) emphasizes the same topics in his recent work *Governing Water: Contentious Transnational Politics and Global Institution Building. And Governance as A Trialogue: Government-Society-Science in Transition* (Turton et al., 2007) discusses the relations between government, society and science in water governance through numerous South African case studies, as well as proposing a variety of institutional innovations where the state role is changing and economic and civil society emerge in water management. Furthermore, the agenda of various international meetings around the world (for instance, the World Water Forum) has included debates on new roles for the state in urban water governance.

As a centrally planned economy, the nation-state's monopoly role in urban water management has long remained unquestioned in China. But recently various

transformations seem to be developing. Besides the larger involvement of economic actors and private capital (see above) and the slowly emerging influence of civil society institutions (see below), one could also hypothesize, for instance, a stronger decentralization of water governance and decision-making, a stronger separation of tasks and responsibilities between different state levels in operation and control/enforcement of water governance, and a stronger emphasis on accountability and transparency of state actions in water governance. Chapters 3, 4 and 6 empirically investigate to what extent and how the nation-state role in water governance is indeed changing along lines of what in the Ecological Modernization literature has been labelled political modernization.

(3) Civil society and environmental NGOs in urban water sector

In many of the Ecological Modernization dynamics in Western societies civil society plays – directly or indirectly – a major role. As the first and still major advocates of environmental improvements, civil society organizations have from the early seventies strongly articulated environmental interests and pushed environmental agendas. While, following Ecological Modernization theory, environmental advocacy has spread over other actors and domains, civil society still play a major role in legitimizing the environmental agendas and actions of these other actors.

But this all is notably different in China, where the impact of urban citizens and environmental NGOs on the governmental decision-making for urban water issues – and many other environmental agendas - have traditionally been weak, controversial and often even considered illegitimate. Since a decade, however, there seems to be more room for manoeuvre for civil society on environmental agenda, as increasingly reported in scholarly reports (cf. Xie and Mol, 2006; Martens, 2006) but also in popular journals and newspapers. The Central Government and SEPA have on numerous accounts called for strengthening the public participation in environmental governance, and numerous environmental NGOs have been active in water matters such as anti-dam protests, water pollution and water allocation. Chinese civil society starts to appear in the arena of urban water governance in various ways, such as direct contact with governmental agencies through environmental complaints (e.g. regarding water pollutions), attending price public hearings to speak out their own views and opinions, and through civil society organizations. Chapter 6

specifically focuses on the development of public hearing institutions for setting water tariff in China, analyzing the roles of civil society in such new institutions.

Intermezzo: Research Methodology

A. Introduction

As formulated in Chapter 1, the objectives of this thesis are to analyze how the institutional arrangements of Chinese urban water sectors change in the transitional stage, how these institutional changes structure Chinese urban water governance, how this affect the roles and relations between the state and other stakeholders (such as economic actors and civil society), how the national water policies are implemented at local levels and to what extend the policy implementation has addressed Chinese water challenges. Given the nature of these questions, a qualitative approach is applied as the major research strategy to interpret which institutional transformations take place and how they influence the roles and responsibilities of various social actors (the state, economic actors, and civil society). But this qualitative research design is complemented with quantitative analyses to measure the distribution of policy innovations and institutional changes around the country.

Before approaching the empirical chapters of this thesis, this intermezzo deals with a number of methodological concerns. Subsequently, a brief summary of the research design is provided (Section B) and the research strategy (including the research methods for data generations) for this thesis is presented (Section C).

B. Research Design

The strength and weakness of qualitative vs. quantitative research approaches in the social sciences is hotly debated and a rich literature has focused on how they can be integrated in mixed methods research. In conducting empirical research on the roles and relations between various social actors (state and non-state actors) in specific institutional arrangement and how they change in developing new governance structures in the urban water sectors, a qualitative research approach is the most appropriate basic research design.

But in order to quantify the identified institutional changes and policy innovations across Chinese urban water governance, quantitative research elements need to be added.

The most commonly mentioned qualitative approaches in relation to social science research are the ethnographic approach as advocated by Robson (2002) and others, the grounded theory approach as developed by Glaser, Strauss and others (e.g. Glaser and Strauss, 1967; Strauss and Corbin, 1998), and the case-study approach as elaborated by, among others, Yin (1993, 1994) and Creswell (1994). Case study research approach, with a flexible design, has been frequently used in political science, sociology, and education. As Yin states, “the role of theory development, prior to the conduct of any data collection, is one point of difference between case-studies and related methods such as ethnography and grounded theory” (Yin, 1994:27).

Taking into account the nature of the research objectives in this thesis, case study research is the most obvious research methodology. Case study research is especially relevant if “a ‘how’ and ‘why’ question is being asked about a contemporary set of events, over which the investigator has little or no control” (Yin, 1984: 20). Yin (1994) classifies four ideal-types of case-studies in two lines: single-case and multiple-case, and holistic-case and embedded-case. Single-case designs are appropriate if the case represents a critical example for testing an already well-developed theory, or if the nature of the case is so unique that comparison would not make sense, or if the case that is analyzed can be considered as a typical case for a larger group of (more or less comparable) cases. Within multiple-case designs, the methodological challenge is to select cases and examine them in such a way that comparison is possible and valuable. Holistic-case designs are suitable when the emphasis lies on the analysis of holistic units within which no sub-units can be identified, or when the theory underlying the case is of a holistic nature. If there are more units of analysis, often identified by breaking down the general subject of analysis into smaller pieces, the design is labeled ‘embedded’.

This thesis aims to understand how the institutional innovations contribute to a new urban water governance structure in China and how the water policies and regulations operate in (local) provinces or municipalities. It is obvious that the institutional innovations of urban water sectors and the changing roles and relations between the state and the non-state actors have no clear defined boundaries. These kinds of questions cannot be addressed via quantitative survey based on large samples, but have to be answered by

carrying out in-depth case studies, which will necessarily be limited in numbers due to the fact that they are time-consuming. Another reason for adopting a case study methodology in this thesis is that the object of study (local provincial or municipal urban water governance) is complex and diverse, involving various scales and diverse economic and social conditions. In this sense, our theoretical elaboration and analytical framework cannot isolate the objects of research from their social, economic, and natural environment.

Furthermore, in order to provide an overall national picture and understanding of developments in each of the identified institutional transformations in Chinese urban water sectors, a large-scale quantitative survey has to be adopted. Such a survey allows us to understand the distribution of these institutional innovations throughout the country and provide information on the extent to which our case studies have wider relevance. Thus, in this research, a combination of large scale surveys and case-study approaches will be used.

Once decisions about research design have been made, the various possible methods of data generation must be identified such as documentation, archives, interviews, questionnaires and observations. Ideally, one would use as wide a variety of sources and methods as possible.

C. Research Strategy

This thesis investigates three kinds of major institutional transformations (i.e. pricing policies, private sector participation, and public participation) taking place in current Chinese urban water sectors, which are all related to the theoretical perspective as elaborated in Chapter 2. For each kind of institutional reform, a large scale survey is used for mapping the distribution of institutional innovations in Chinese urban water management, and a case-study approach is applied for the in-depth analyses of a limited number of cases.

Furthermore, in order to measure the dependence between the degree of private investment and the public investment at a certain given charge rate in the wastewater sector, a quantitative model is developed (in Chapter 5).

Table C.1 summarizes the major data collection methods applied for each of the three urban water sector innovations. In Appendix 1, the interviewees for this thesis are listed. Below we elaborate for each of the three research methods.

Table C.1 Major Methods of Data Collection

Themes	Nationwide survey	Case studies
Pricing policies	<ul style="list-style-type: none"> ● Document analyses ● Literature review ● Quantitative document analyses 	<ul style="list-style-type: none"> ● Document analyses ● Face-to-face interviews ● Telephone interviews
Private sector participation	<ul style="list-style-type: none"> ● Document analyses ● Literature review ● Quantitative document analyses ● Field investigation 	<ul style="list-style-type: none"> ● Literature review ● Document analyses ● Face-to-face interviews
Public hearings	<ul style="list-style-type: none"> ● Document analyses ● Literature review ● Quantitative analyses of internet-based documents ● Paper questionnaires ● Internet-based questionnaires 	<ul style="list-style-type: none"> ● Document analyses ● Face-to-face interviews

C.1 Large Scale Survey Research

Given that all the three kinds of institutional innovations (pricing, private sector involvement, and public hearings for governmental decision-making) in Chinese urban water sectors are spread around China, it is important to know the general development of the national policies supporting these innovations, and the variety of local implementation

in different social, economic, and natural contexts. In doing so, nationwide surveys are conducted using different methods of data collection.

(i) Methods of data collection for water tariffs

In this thesis, the fundamental data of water tariffs (including water tariffs for households, water tariffs for industrial use, and wastewater treatment charges) of various cities are collected mainly through the database of ChinaWaterNet (www.h2o-china.com), which provides the water tariff data of 36 key cities and other medium sized cities. This data base is complemented with relevant documents and literature, and the official websites of local price authorities (cf. Guizhou Province), and with information from interviews during field research (e.g. Maanshan City, Guiyang City, and Macao City).

(ii) Methods of data collections in nationwide surveys

In Chapter 3, the cost data of water provision of 36 key cities are collected from a major research report of the Ministry of Construction MOC (General Office of the MOC, 2005). The fundamental data of the implementation of wastewater treatment charge scheme in 661 Chinese cities are collected from a 2003 survey report of the National Development and Reform Commission NDRC and the MOC (NDRC and MOC, 2003). In addition, various data of water consumption are collected via different statistical yearbooks (cf. Appendix II).

Regarding the development of private sector participation in Chapter 4, the basic data on (both water supply and wastewater) projects with private sector involvement are collected via the 2005 nationwide survey of the MOC (in this survey, all data came from the reports of provincial-level authorities) and field surveys of Water Policy Research Center of Tsinghua University in which I have participated. In total, the data (such as modes of public-private partnership, project capacity, and project location) of 152 water supply projects and 200 wastewater treatment projects with private sector involvement are collected.

For the survey on public hearings for water tariff setting in Chapter 6, a large scale internet-based inventory and a quantitative document analysis has been conducted. Information was collected from thousands of news articles published on public websites in 2005 and 2006, including over 20,000 pieces of news collected via the search engines www.google.com and www.baidu.com, over 1600 pieces of news collected from the most popular professional websites regarding Chinese water management (ChinaWaterNet www.h2o-china.com, and info.water.hc360.com), and other news from official governmental websites and specific websites of price bureaus of all provinces as well as press websites (such as www.cctv.com and www.xinhuanet.com). In addition, to investigate the familiarity and perception of public hearings for water tariff setting among Chinese urban citizens, a paper questionnaire was distributed among a representative sample of 2050 households in January to March 2006 and 1834 valid questionnaires were returned. At the same time (early 2006), a more or less identical online questionnaire was conducted in one and a half month by ChinaWaterNet (www.h2o-china.com), raising 938 effective respondents. The two questionnaires are analyzed and compared.

C.2 Case Studies Research

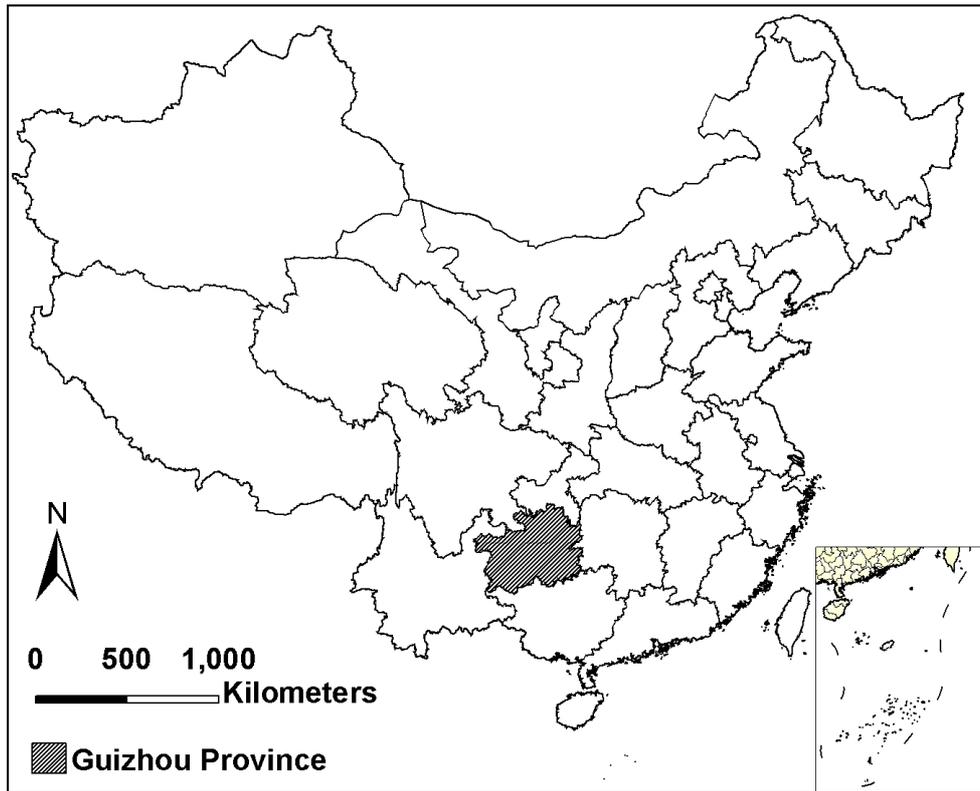
In addition to the national-level survey on the institutional changes of urban water sector in China, a case-study research strategy is applied to gain in-depth insights in the local implementation (provincial or municipal levels) of national policies and regulations for each of the three major institutional innovations.

The three institutional transformations in current Chinese urban water sector are the basis on which the case-studies designs are selected – which is thus an information-oriented selection (Flyvbjerg, 2004). In methodological terms, the cases are selected in terms of the principle of theoretical replication; the outcomes are expected to differ among the cases, but for logical reasons with generalizing meaning. Taking into account the nature of the three themes in this thesis, two different case-study design are applied: with respect to the pricing policies and implementation, a single case design (typical case-study) is applied (Chapter 3); while a multiple case-studies design is adopted to the study on private sector involvement (Chapter 4) and public participation in governmental decision-making (Chapter 6).

(i) Implementing pricing policies in urban water sector: a single case-study

The first major institutional transformation of Chinese urban water sectors is the introduction and implementation of economic and pricing instruments over the past decades. China has a tradition that the local (provincial and city) governmental agencies, as policy-takers of national policies and regulations, often react to, interpret and implement the central policies through issuing local policies and regulations. While various pricing instruments (such as cost-covering price for water provision, wastewater treatment charge, water resource fee, and raw water price) have been gradually introduced to Chinese national water policy, the speed of local governmental agencies' reaction to these national policies differs. For instance, some cities have not yet established a local scheme of wastewater treatment charges by now. This thesis takes Guizhou Province as a case study, where various pricing approaches have been applied following national policies. As a single case study, Guizhou is not fully representative for other provinces, but an in-depth analysis of Guizhou water tariff setting provides us insights on the social and economic dynamics of local water tariff implementation, which will not be too different from what can be expected in other provinces.

In this case study of pricing policy data on water consumption are based on the statistical yearbook and official gazette (online) of Guizhou Water Resource Bureau. The data on various kinds of water tariff rates (e.g. water resource fee, water tariff for households, and raw water fee) are collected through the face-to-face interviews with officials of Guizhou Price Bureau (in 2005), documents of Guizhou Price Bureau, and relevant policy papers of Guizhou. The main information on the social and policy dynamics of water tariff setting and implementation come from interviews with officials from Guizhou Price Bureau in 2005 and officials from Guizhou Water Resource Bureau in 2007.

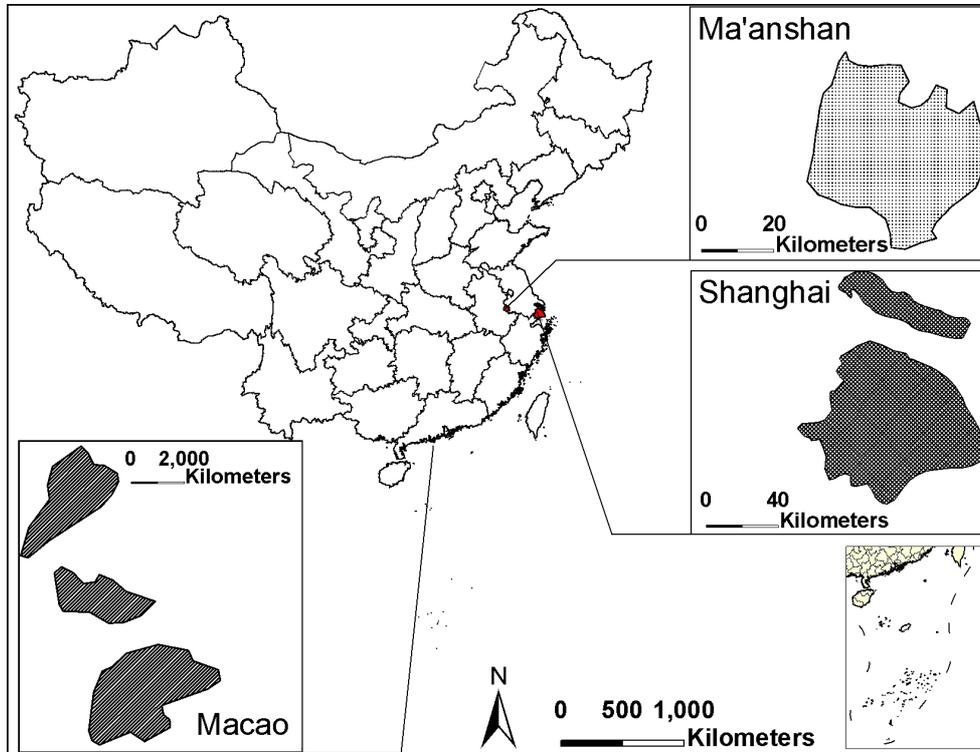


Map 1 Location of Guizhou Province, China

(ii) Private sector involvement and development in urban water sector: multiple case-studies

A second major institutional change is the involvement of the private sector and the construction of various forms of public-private partnership. In this context, a multiple case-study design is applied, because various forms of public private partnership (PPP) constructions have been experimented upon in the urban water sector and no one typical mode of PPP can be identified as dominant at this early stage of development. Taking into account the distribution of various forms of PPP projects in Chinese urban water sector

(based on the outcome of a nation-wide survey), in this thesis three influential PPP projects with different forms of PPP and in various locations are selected and analyzed (Chapter 4).



Map 2 Location of Maanshan City, Shanghai City and Macao City

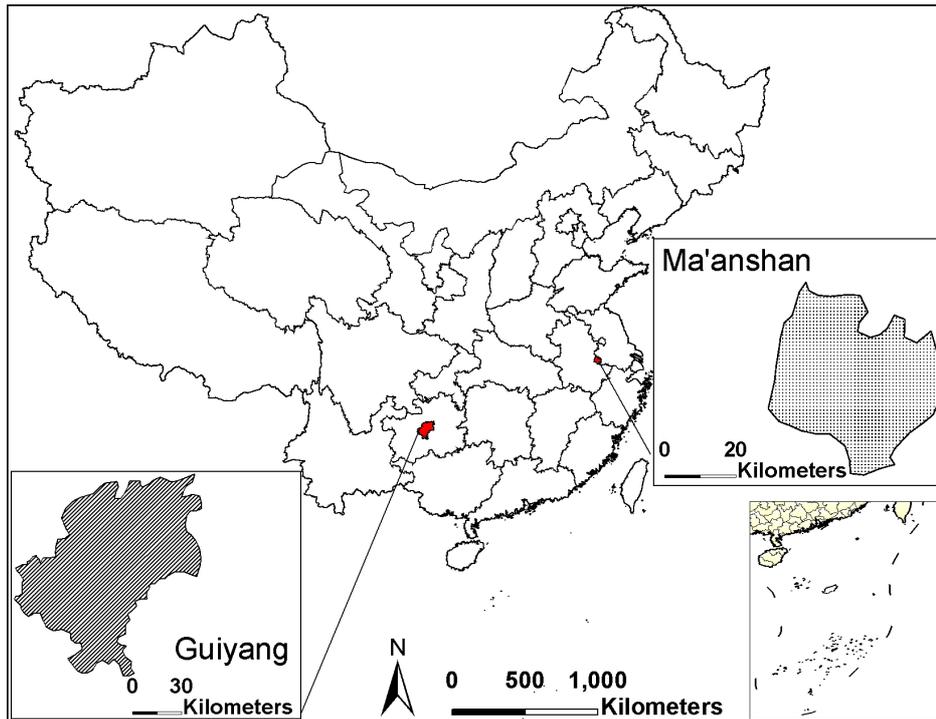
Regarding the three case studies with private sector involvement, the information of Maanshan (joint venture in water supply) and Shanghai (BOT in wastewater) were generated mainly from interviews with local officials of relevant governmental agencies and company managers, and analysis of local documents. The data on the Macao project (concession in water supply) are based on a project of the Water Policy Research Center of Tsinghua University in 2006, in which I have participated. Also here, the main information

sources were interviews with local governmental and company officials and documents of the city and involved private parties.

(iii) Public hearings and public participation in urban water sector: multiple case-studies

A third major institutional innovation is the emergence of public hearings for setting water tariffs, in which the public is provided access to and participation in the process of governmental decision-making. As municipal-level governmental agencies are the main actor in organizing public hearings for setting water tariff in contemporary China and two main decision-making processes of setting water tariffs can be distinguished in Chinese cities, two case studies are selected, with different decision-making systems and different geographic, social and economic conditions (Chapter 6).

With respect to these cases on public hearings for water tariff setting, the information was collected from the face-to-face interviews with officials of Maanshan Price Bureau and Guizhou Price Bureau, respectively. In addition interviews with some of the participants to the public hearing gave insight in the actual process during discussing and voting for price tariff proposals. Furthermore, reported news contributed to insights in various public hearings in details.



Map 3 Location of Maanshan City and Guiyang City

C.3 Quantitative Modelling

Given the fact that the level of (water) service charges often has a (direct or indirect) impact on governmental investment/subsidies, as well as on the private investment in this field, it is interesting to measure the dependence of private investment on the scale of public investment at different levels of (water) service charges, taking into account the general background of private sector participation in Chinese urban water sectors. In doing so, a quantitative model is developed in Chapter 5.

Chapter 3 Water Price Reforms in China: Policy-Making and Implementation¹⁷

Abstract

Following the conviction that economic and pricing approaches are an essential addition to conventional command-and-control environmental regulation, China has gradually increased attention to, research on and experiments with the application of economic instruments in urban water management over the past two decades. This paper analyzes the actual application and implementation of economic instruments in Chinese urban water sectors, applying an ecological modernization perspective. Research shows that Chinese style ecological modernization should pay more attention to the institutional dimensions of natural resource pricing policies, if it is to profit from economic approaches in urban water management.

Key words

Water price policies, environmental fees, environmental governance, China

3.1 Introduction

The application of economic and pricing approaches in environmental governance and natural resource management is not new. For over three decades (environmental and natural resource) economists, among others, have argued that the application of economic instruments is an effective and efficient way to achieve environmental goals. These economic approaches need to complement conventional policies of specifying technological standards and implementing these via command-and-control strategies. With respect to water systems (water resource,

¹⁷ This chapter contains a submitted article to *Society & Natural Resource* in August 2007, as Zhong, L., and A.P.J., Mol, Water price reforms in China: Policy-making and Implementation (under review).

water supply, and wastewater) this argument has received further attention and application after 1992, with the promulgation of Agenda 21 and the 1992 Dublin Statement. Both documents claimed that water should not be regarded as only a public good, but also as an economic good. Other scholars, however, have warned against a too one-sided emphasis on the economic nature of water, resulting in still ongoing discussions and debates on economic approaches in water management, touching upon issues such as valuing water resources, privatization, introduction of water pollution taxes, setting of tariff structures for different user categories, rational water pricing, and cost functions (e.g. Rogers, et al., 2002; Boland, 1997; Kim, 1995; Renzetti, 1992, 1999; Postel, 1993; Winpenny, 1994; Andersen, 1994; OECD, 1997, 1999; REC, 2001). But in all these debates, consensus seems to emerge that water should be priced.

Over the last two decades, China has witnessed simultaneously a dramatic change in its economic structure and organizing principle, and an increase in a variety of serious urban water challenges (e.g. safeguarding drinking water quality and quantity, treatment of industrial and domestic wastewater, urban water flooding). During these past two decades there has been a gradual increase in attention to, research on and experiments with the application of economic instruments in urban water management. Due to its developmental and transitional status interest of policy-makers and researchers in economic approaches in urban water management developed in China later than in most OECD countries. But at the start of the new millennium, both central and local governments have made considerable efforts to introduce economic and pricing approaches into water-related (national and local) policy papers. Currently, the issue of water pricing is seen as of central importance in water sector reform in contemporary China; topics such as setting right prices for water resources, water rights and tradable permits, full cost recovery of water services, and cost control are given priority over traditional water policies. But designing and implementing economic and pricing instruments for governing China's water system also face major challenges (in particular compared to other western countries).

This paper analyzes the actual application and implementation of economic instruments in urban water management in China, with a focus on the water tariff system (which includes a water supply price, a raw water price, a water resource fee, and a wastewater treatment charge). After reviewing ideas of economizing the ecology through pricing instruments under the framework of ecological modernization (section 2), this paper analyses the water price reforms of China in general (section 3), followed by a detailed analysis of water tariff reforms in one

province, Guizhou (section 4). In doing so, this paper aims to identify how national policies of water pricing have advanced over the last decade and to what extent these policies have been successfully implemented at a provincial and local level. At the same time the article shows the necessity of including institutional aspects in introducing natural resource pricing policies.

3.2 Ecological Modernization and ‘Economizing of Ecology’

Developed from the late 1980s onwards, first especially in Northwestern Europe, ecological modernization theory has become a leading perspective in analyzing and interpreting environmental reform (Sonnenfeld and Mol, 2002). The basic premise of ecological modernization theory is the centripetal movement of ecological interests, ideas and considerations in the social practices and institutional developments of modern societies. This results in ecology-inspired and environment-induced processes of transformation and reform of core practices and central institutions of production and consumption. In ideas of ecological modernization technological change and the internalization of external costs (often referred to as the ‘ecologizing of the economy’ and the ‘economizing of ecology’, respectively; cf. Mol, 1995; Spaargaren, 2000) are key mechanisms for environmental reform. But a successful ecological modernization should not be reduced to just technological or economic reforms (Christoff, 1996; Mol and Spaargaren, 2000). Institutional changes and dynamics are of equal importance, often referred to as political modernization, environmental capacity building, and civil society participation and involvement (cf. Mol, 1995; Andersen and Massa, 2000; Seippel, 2000; Tatenhove et al., 2000).

For quite some time ecological modernization has been mainly a western concept. But with respect to China, the release of the ‘China Modernization Report 2007: Study on Ecological Modernization’ (China Centre for Modernization Research, 2007) – with large scale media and public attention in China and around the world - changed that. Through its subtitle, literature review, and analysis, it officially and publicly introduced in China the concept, ideas, and scholarly literature around ecological modernisation. It is not the first introduction of ecological modernization in China. Several Chinese academics have studied and applied ecological modernization (e.g. He and Wu, 2001; Huang and Ye, 2001; Zhang, 2002; Liu, 2005), and western scholars have discussed ecological modernization dynamics

in China (e.g. Mol, 2006). But the background and positions of the experts and academics that assembled this 2007 study indicate that through this report ecological modernization ideas have reached relevant governmental departments.

In developing ecological modernization for China the China Centre for Modernization Research (2007) provides an extensive introduction to the history, core principles, developments and analytical methods of ecological modernisation theory as it was developed in Europe. Many of the key concepts of Western style ecological modernisation theories can be found back here, such as dematerialization, the ecologizing of the economy, decoupling, prevention, clean technology. But, besides a few remarkable new things, this Chinese interpretation of ecological modernization deviates on several point from its western counterpart (see Zhang et al., 2007, for a review). In contrast with the Western literature on ecological modernisation, the China Centre for Modernization Research (2007) follows primarily a economic-technological analysis of (and explanation for) environmental improvements. Technological innovations and economic valuation and restructuring are interpreted as key to environmental reform. But political modernisation, subpolitics, and the reinvention of environmental governance – as the more political and institutional innovations in western ecological modernisation literature – are hardly referred to. There is also limited attention to civil society participation, such as the role of environmental NGOs. Given that, one could classify this report as belonging to the first – rather than third – phase of ecological modernisation scholarship, i.e. that focusing on technological innovation and economic institutions, rather than on governance, institutions and participation (Mol and Sonnenfeld, 2000, pp. 4-5); or to a weak version of ecological modernisation (Christoff, 1996).

In investigating water pricing in urban water management we will show that this Chinese ecological modernization perspective is more than just a different theoretical interpretation, but that it has also consequences for current environmental policies. Several Western ecological modernization studies have shown that successful use of economic approaches to water problems need a strong focus on the institutional underpinnings of water pricing (cf. Andersen, 1994; van Vliet, 2002). By analysing to what extent, how and how successful China has introduced and implemented policies of economic valuation in addressing urban waters problem we illustrate the (consequences of a) neglect of governance and institutional dimensions in this field.

3.3 Water Pricing Reforms in China

The introduction of economic and pricing instruments in the Chinese legal framework for water management can be traced back to 1965, with the promulgation of the *Tentative Administrative Method on Collecting and Managing Water Charges of Hydraulic Engineering*. This legal document for the first time introduced a fee for various raw water uses (such as industrial use, use for hydropower generation, and municipal use)¹⁸, especially meant to cover (part of) the costs of constructing and maintaining water engineering facilities. However, this early experience of pricing water did not successfully address the encountered problems of funding shortage, due to a weak implementation structure and very low rates. Since the late 1970s, there has been a gradual increase in applying various economic and pricing instruments in water management in China, among which are standards with economic incentives, licensing the management of water-abstraction and wastewater-discharge restrictions (also with economic incentives), user charges, and a water pollution levy. These instruments were introduced through a variety of ministerial policy papers and regulations, especially since the second half of 1980s. Table 3.1 provides an extensive overview of the various policy documents, the major focus of each document, and the different economic and pricing instruments introduced in China's water management.

¹⁸ According to the *Tentative Administrative Method on Collecting and Managing Water Charges of Hydraulic Engineering* (No.350 Policy Paper, the MOWREP, 1965), the rates of raw water charge were as follows: 1) industrial use: 0.0005-0.002 RMB per cubic metre for water circulation, and 0.003-0.01 RMB per cubic metre for water use in production; 2) hydropower use: 0.0001-0.001 RMB per cubic metre; 3) municipal use: 0.002-0.005 RMB per cubic metre (but not exceeding 5% of the cost of water production). At that time, 1 USD equalled 2.4618 RMB.

Table 3.1 Overview of Major National Water Policies with Economic Incentives in China

Title	Document catalogue ^(a)	Issue year	Major focus	Proposed economic instruments ^(b)
Tentative Administrative Method on Collecting and Managing Water Charges of Hydraulic Engineering	No.350 Policy Paper of the formerly MOWREP	1965	WR	2
Tentative Environmental Protection Law of PRC	SCNPCC	1979	WW	2
Water Pollution Prevention Law of PRC	SCNPCC	1984	WW	1, 2, 6
Administrative Method on Accounting, Collecting and Managing the Raw Water Charges of Hydraulic Facilities	No.94 Policy Paper of the State Council	1985	WR, WRS	2
Environmental Protection Law of PRC	SCNPCC	1989	WW, WR	1, 6
PRC Ordinance on Urban Water Supply	No.158 Policy Paper of the State Council	1994	WS	2
Circular on “Administrative Method of Urban Discharge Permit” (annulled)	No.330 Policy Paper of MOC	1994	WW	1
Circular on Collecting Water Resource Fee	GOSC	1995	WR	2
Administrative Method on Urban Water Supply Price	No.1810 Price Policy Paper of the formerly NDPC	1998	WS, WW	2

Title	Document catalogue ^(a)	Issue year	Major focus	Proposed economic instruments ^(b)
Circular on the Key Issues for Carrying out the 'Administrative Method on Urban Water Supply Price'	No.611 Policy Paper of the formerly NDPC and the MOC	1999	WS, WW	2
Circular on Enhancing the Enforcement of the Wastewater Treatment Charge Scheme and Establishing Urban Drainage and Wastewater Treatment System	No.1192 Price Policy Paper of the formerly NDPC, the MOC, and the SEPA	1999	WW	2
Circular on Intensifying Water Conservation and Water pollution Prevention	No.36 Policy Paper of the State Council	2000	WR, WW, RW	1, 2, 4
Water Law of PRC (revised)	SCNPCC	2002	WR, WRS	1, 2, 6
Circular on Facilitating Water Supply Price Reform	No.515 Policy Paper of the formerly NDPC, the MOF, the MOC, the MOWR, and the SEPA	2002	WS, RW, WW, WR	2
Opinions on Advancing the Industrialization of Urban Wastewater Treatment and Municipal Solid Waste Disposal	No.1591 Investment Policy Paper of the formerly NDPC, the MOC and the SEPA	2002	WW, SW	2
Circular on Enhancing Urban Water Conservation and Ensuring Safe Water Supply	No.171 Policy Paper of the MOC	2003	WR, WS	2

Title	Document catalogue ^(a)	Issue year	Major focus	Proposed economic instruments ^(b)
Circular on Promoting Water Price Reform, Saving Water Use and Protecting Water resource	No.36 Policy Paper of the GOSC	2004	WS, WR WW, RW	2, 5
Administrative Method on Raw Water Price of Hydraulic Facilities	No.4 Policy Paper of the NDRC and the MOWR	2004	WR, WRS	2
Ordinance on Water Abstraction Permit and Water Resource Fee Collection	No.460 Policy Paper of the State Council	2006	WRS, WR	1, 2
Administrative Method on Urban Wastewater Discharge Permit	No.152 Policy Paper of the MOC	2006	WW	1

Notes:

(a) The Chinese legal system mainly includes four levels: laws promulgated by the NPCC or SCNPCC (highest legal status), administrative regulations of the State Council, sector regulations of ministries and commissions, and local policies and regulations (promulgated by local PCC or SCPCC).

(b) According to Seroa Da Motta et al. (2004) and the USEPA (2004), six major types of economic instruments can be identified in water management: (1) Standards such as pollution standards, fines and sanctions, and licensing of water-abstraction or wastewater-discharge restrictions are a kind of command-and-control-oriented policy instruments with economic incentives; the government restricts nature and amount of pollution or resource use, compliance is monitored and sanctions are installed for non-compliance. (2) Pricing mechanisms, including charges, fees and taxes form widely-applied economic instruments for water management (e.g. water user charges, wastewater treatment charge, charges on water abstraction and water resource system) by which the government charges a fee to individual polluters or resource users based on the amount of pollution or resource use. (3) Trading mechanisms, for instance tradable water rights and trading of pollutant emission rights, are established by the government for polluters or resource users to trade permits at unregulated market prices. (4) Performance rating is a kind of program that requires disclosure of environmental information on the final end-use product, e.g. eco-labeling, ISO14000, and black-lists of polluters. While they do no price natural resource, they have an effect through market demand. (5) Subsidy systems, including grants, low-interest

loans, favorable tax treatment, lending practices of international banks, and preferential procurement policies for products believed to be environmentally friendly. (6) Liability as a mechanism for compensating victims of pollution and as a mechanism to encourage compliance with existing environmental regulations.

Abbreviations used:

GOSC: General Office of the State Council	SCNPCC: Standing Committee of National People's Congress Council
MOC: Ministry of Construction	SCPCC: Standing Committee of (local) People's Congress Council
MOF: Ministry of Finance	SEPA: State Environmental Protection Administration
MOWR: Ministry of Water Resource	SW: solid waste
MOWREP: Ministry of Water Resource and Electric Power	WR: water resource
NDRC: National Development and Reform Commission	WRS: water resource system (or hydraulic engineering)
NDPC: National Development and Planning Commission	WS: water supply
PCC: (local) People's Congress Council	WW: wastewater
RW: reclaimed water	

Given the fact that Chinese water management is subjected to several ministries, commissions and agencies, the practice of pricing urban water has confronted various problems of inefficiency and ineffectiveness, following conflicting competencies between governmental organizations and the lack of effective horizontal and vertical coordination. In the early experiences of water-related policy design, economic instruments were only proposed on one single issue by one specific ministry (or commission). For instance, the MOWR (the competent national authority for water resources) was mainly interested in the water resources and the water engineering system, while the MOC (the competent national authority for urban water infrastructures) had responsibilities for the urban water infrastructures, among which public water works, water and sewer pipelines and wastewater treatment plants. There was little coordination between these two authorities in issuing water prices and economic instruments to cover the costs of their activities. Over the past three decades, one of the major changes within the national policy design is that the water tariff reform – our main focus in this paper - is moving from a highly segregated system of various individual prices and charges towards an

integrated system, not only with respect to the different water issues (water supply, wastewater treatment, water engineering and water resource being the four important categories), but also with respect to the competent water-related authorities (such as the powerful NDRC, the MOWR, the MOC, and the SEPA).

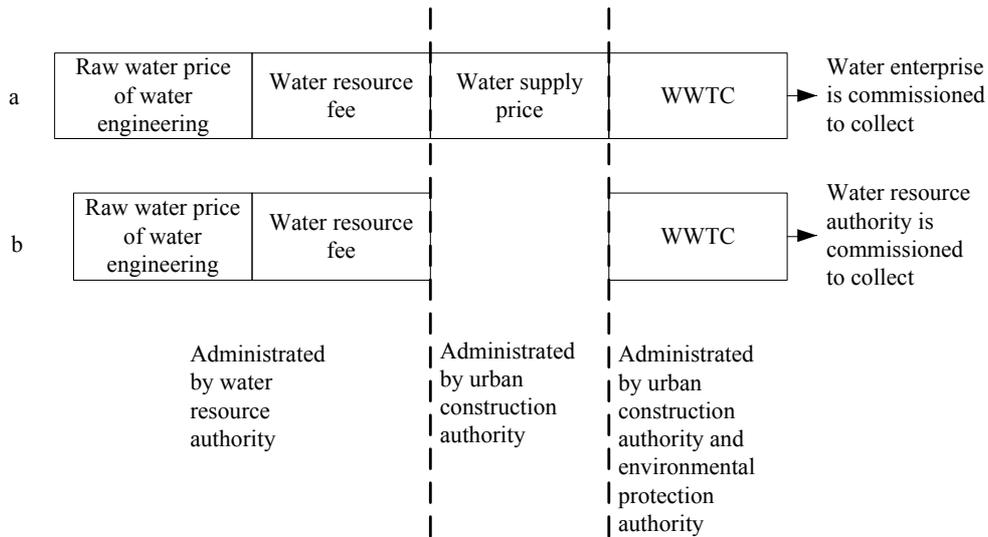
At the moment two major water tariff systems for water users are implemented, depending on the means of water supply (public water works and self-providers; ref. Figure 3.1). The water tariff consists of four respectively three elements, set by different authorities but integrated in one water tariff to be collected by either the water enterprise or the water resource authority. We will elaborate on the four elements, respectively.

Due to the perception of abundant water resources and its public good character, raw water was provided to users almost free of charge until the promulgation of the *Administrative Method on Accounting, Collecting and Managing the Raw Water Charges of Hydraulic Facilities* in 1985 (No.94 Policy Paper, the State Council, 1985). This regulation proposed to charge various kinds of users for the costs of water provision (including the operation and maintenance cost, overhaul cost, depreciation, and other expenses). However, the average level of raw water charge equaled to 1/3 of the cost of water production in 1996 (Wu, 2001). Moreover, the implementation and enforcement of this policy was not very effective, resulting in low levels of charge collection. In 2004 this changed.¹⁹ Firstly, raw water obtained from hydraulic facilities should be regarded as a commercial good and be subject to a much higher price, the so-called raw water price²⁰, and it doubled from 0.028RMB/m³ in 2000 to 0.06RMB/m³ in 2005 (MOWR, 2005). Secondly, various (economic) approaches and measures were adopted for setting, managing and collecting raw water prices, such as two-part tariff²¹, volume-based metering, cost functions etc. Thirdly, private sector involvement in building and managing hydraulic facilities was encouraged, which sometimes reduced the costs and brought in much needed private capital for infrastructure investment.

¹⁹ With the promulgation of the *Administrative Method on Raw Water Price of Hydraulic Facilities* (No.4 Policy Paper, the NDRC and the MOWR, 2004).

²⁰ The price of raw water from hydraulic engineering is proposed as a commercial-oriented one that is calculated in terms of production costs, expenses, profit and taxation.

²¹ Water tariffs for the first cubic meters of water consumption are usually set at a lower level than subsequent units of water consumption. The turning point differs for various user categories and also among provinces. See below for examples in Guizhou province.



(a) water tariff structure of public water works;

(b) water tariff structure of water self-providers (no water supply price included)

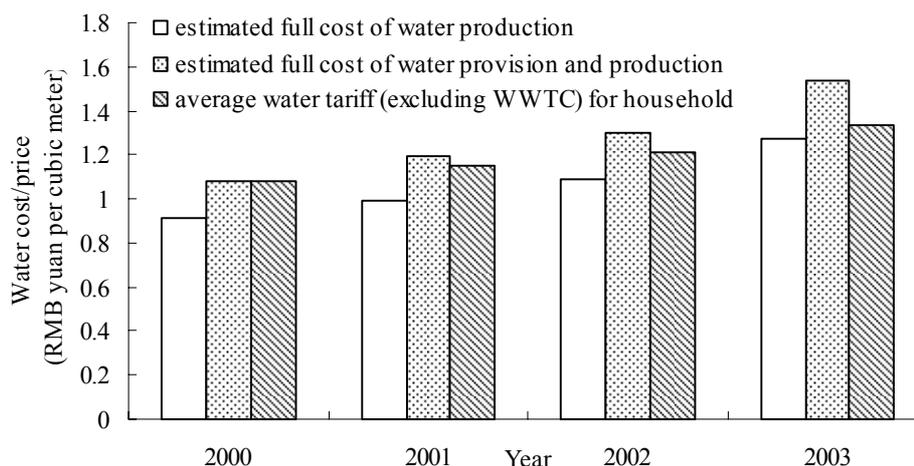
WWTC: wastewater treatment charge

Figure 3.1 Water Tariff Structure

In addition, with the enactment of the *PRC Water Law* (1998) a water resource fee was proposed to protect water resources and improve water use efficiency. Subsequently, the issue of increasing the rate of water resource fee was emphasized in various national policy papers²². In 2004, the No.36 Policy Paper of the General Office of the State Council called for setting the rates of water resource fee according to the degree of water scarcity, and to combine this price reform with a reform of the urban water supply price. In practice, charges for raw water from water engineering facilities and charges for water resources are often not clearly differentiated and usually lumped together or confused.

²² Such as the *Circular on Intensifying Water Conservation and Water Pollution Prevention* (No.36 Policy Paper of the State Council, 2000), the revised *PRC Water Law* (SCNPCC, 2002), the *Circular on Facilitating Water Supply Price Reform* (No.515 Policy Paper of the formerly NDPC, the MOF, the MOC, the MOWR, and the SEPA, 2002), and the *Circular on Promoting Water Price Reform, Saving Water Use and Protecting Water Resource* (No.36 Policy Paper of the GOSC, 2004).

The *PRC Ordinance on Urban Water Supply* (No.158 Policy Paper of the State Council, 1994) proposed to set a price for water supply (which would not include water self-providers) and add that to the cost of water production in order to make the water provisioning self-financing. Subsequently, pricing details for water supply service were developed, such as the classification of water consumers, the tariff structure, formula of tariff setting, the administrative procedure of tariff setting, and enforcement and supervision of this water supply price.²³



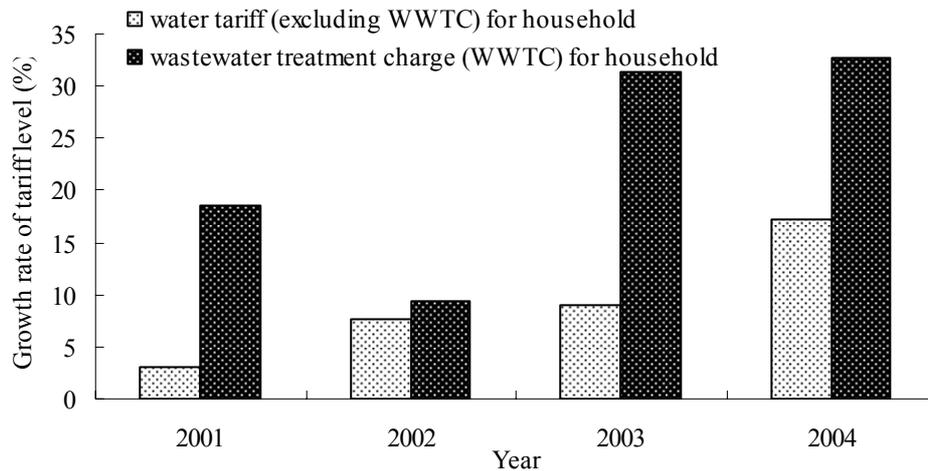
(Source: General Office of the MOC, 2005; water tariff database of ChinaWaterNet, www.h2o-china.com, 2006)

Figure 3.2 Average Costs and Water Tariffs (excluding WWTC) for Households of 36 Key Cities in China, 2000-2003

As a consequence of these policies, the 1990s witnessed an annual growth rate of the total water tariff (excluding WWTC) of 16.5% (Wang, 1999), which slowed down a little at the start of the millennium (cf. Figure 3.3). At present, this water supply tariff almost covers the costs of production and provision of water (cf. Figure 3.2). The average full cost of water of 36

²³ In the *Administrative Method on Urban Water Supply Price* (No.1810 Price Policy Paper, the formerly National Planning Commission, 1998) and the follow-up *Circular on the Key Issues for Carrying out the 'Administrative Method on Urban Water Supply Price'* (No.611 Price Policy Paper, the formerly NDPC and the MOC, 1999).

key cities between 2000 and 2003 increased from 1.084 to 1.539 RMB/m³; among which the relative largest increase was of the water resource fee, from 0.012 to 0.044 RMB/m³ (General Office of the MOC, 2005). The average water tariff (excluding WWTC) increased over the same period from 1.081 to 1.338 RMB/m³ for household users, and from 1.343 to 2.096 RMB/m³ for industrial users²⁴.



(Source: Zhang, 2005; water tariff database of ChinaWaterNet, www.h2o-china.com)

Figure 3.3 Average Annual Growth Rate of Water Tariffs (excl. WWTC) and Wastewater Treatment Charges in 100 Large and Medium Sized Chinese Cities, 2001-2004

Furthermore, in the second half of the 1990s the Chinese Government called for inclusion of a wastewater treatment charge (for both users of public water works and self-providers), as proposed in the *Administrative Method on Urban Water Supply Price* (No.1810 Price Policy Paper, the formerly NDPC, 1998). The charge level should be set at the level of operation and maintenance cost.²⁵ In practice, the enforcement of wastewater

²⁴ Water Price Database of ChinaWaterNet, at: www.h2o-china.com.

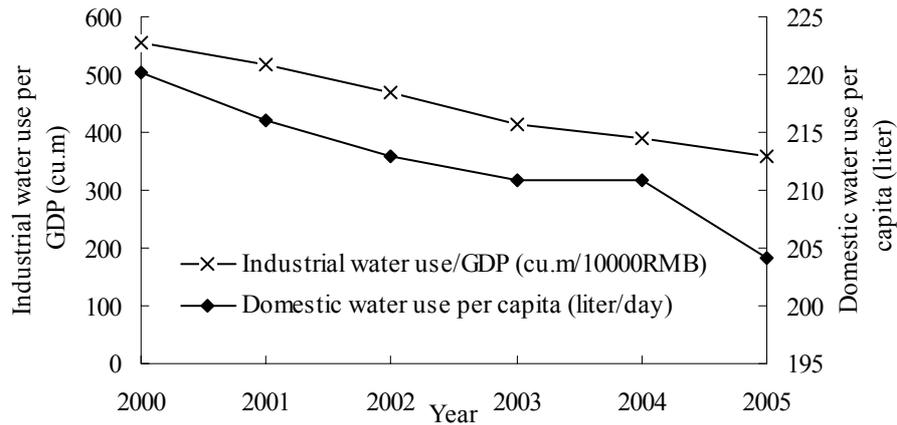
²⁵ The *Circular on Enhancing the Enforcement of the Wastewater Treatment Charge Scheme and Establishing Urban Drainage and Wastewater Treatment System* (No.1192 Price Policy Paper, the formerly NDPC, the MOC

treatment charges proved not simple, but a complicated and time-consuming process. In 2002, 325 cities (49% of total 661 cities in China) within 30 provinces (Tibet excluding) had set the local wastewater treatment charge scheme, but the charge level in most cities was quite low. Moreover, only 40 cities (12.3% of the 325 cities with local wastewater treatment charge schemes) had an effective collection of wastewater treatment charges (NDRC and MOC, 2003). By June of 2005, 186 cities (28% of total 661 cities in China) had not established the local charge scheme for wastewater treatment yet (MOC, 2005a). After a series of policies were issued for promoting the water tariff reform by Chinese governments, the wastewater treatment charge level has increased sharply in recent years. Compared to 2000, the average level of wastewater treatment charge for households has increased in 2004 2.78 times, while the water tariff for households (excluding WWTC) increased 1.42 times over the same period (Figure 3.3).

Figure 3.4 details the domestic water use per capita and industrial water consumption per unit of GDP over the first years of the new millennium. Both show a decreasing trend. The average domestic water use per capita decreased from 220.2 liter per day in 2000 to 204.1 liter per day in 2005; the average industrial water use per 10,000RMB GDP decreased from 554 m³ in 2000 to 360 m³ in 2005. Figure 3.5 provides the domestic water use per capita by provinces in 2002-2005, respectively. Of all provinces 21 have decreased the domestic water use to a greater or lesser extent; in 9 provinces an increase can be witnessed. Although it is difficult to relate water price policies to water consumption levels²⁶, it is widely believed among Chinese water experts that the increased water tariff rates have made a positive impact on improving efficiency of water consumption (both for industrial and domestic use).

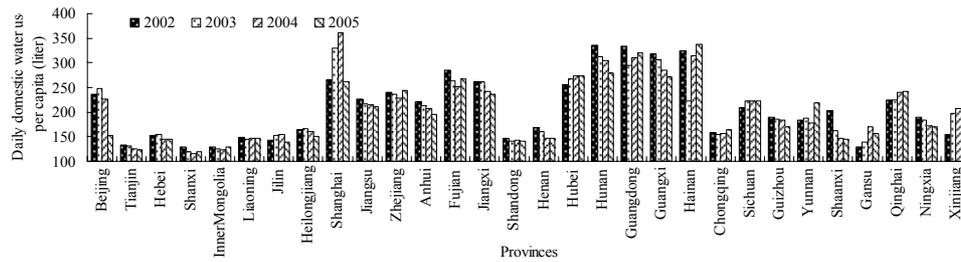
and the SEPA, 1999).

²⁶ It is sheer impossible to relate actual water prices to provincial water consumption in China, because, among others, official water tariffs are often not fully implemented at all water users; water tariffs differ significantly by cities, also within provinces; and causality is difficult to prove



(Source: MOC, China Urban Construction Statistics Yearbook 2005; NBS and SEPA, China Statistical Yearbook on Environment 2006)

Figure 3.4 Domestic Water Use (in Litres per Capita) and Industrial Water Use (in cu.m per 10,000 RMB GDP), 2000-2005



(Source: National Bureau of Statistics of China, China Statistics Yearbook 2003-2006)

Note: Data is not available for Tibet

Figure 3.5 Domestic Water Use (in Litres per Capita) by Provinces, 2002-2005

3.4 Water Tariff Reforms of Guizhou Province

As noted above the various national policies on water pricing over the past two decades have not always witnessed a smooth implementation at more decentral levels. How have these national water pricing policies been implemented, what bottleneck in water price implementation and enforcement are encountered, and to what extent have they contributed to a more rational use of water? This section uses the case of water tariff reforms in Guizhou Province to provide a better insight in these topics. The authors have conducted interviews with officials from Guizhou Price Bureau and Guizhou water resource authorities, as well as managers of several local water companies, to obtain detailed information on implementing water tariff reforms Guizhou province.

Guizhou Province, located in southwest China, is one of most water-abundant provinces in China with ample capacity of hydroelectricity generation. It is also one of the more underdeveloped provinces, with a GDP per capita of 4,010 RMB in 2004 (well below the national average of 12,336 RMB). Following national policies, Guizhou Province has designed local water policies and regulations and introduced various kinds of water tariff reforms such as a water price for hydraulic engineering (water resource system), a water resource fee, a wastewater treatment charge, and a cost-recovery price of water supply. A two-part pricing system is in use²⁷. Guizhou province is one of the 21 provinces that saw its water use per capita (slightly) decreasing over the last 5 years (Figure 3.5). This rather modest decrease is believed to be partly caused by problems in designing and implementing water price policies. The

²⁷ Xingren County and Zhenfeng County are the forerunners of two-part pricing in Guizhou Province. The current water tariff rates of Xingren County were introduced in October 2004. It applies two different rates for water users, according to the amount of water use. For household users, a basic rate of 2.05RMB/cu.m is applied to water use less than 6 cu.m per month, while a higher rate of 2.45RMB/cu.m is applied to water use above 6 cu.m. For industrial and commercial users, 60% of monthly water use is paid at the rate of 3.2RMB/cu.m and 40% of monthly water use is paid at the rate of 3.8RMB/cu.m. For special users (e.g. leisure and tourism industry), 60% of monthly water use is paid at the rate of 4.1RMB/cu.m and 40% of monthly water use is paid at the rate of 4.7RMB/cu.m. The current water tariff can cover part of cost (which amounts 3.13RMB/cu.m) (Xingren Water Supply General Company, personal communication, January 10 of 2007). The current water tariff rates of Zhenfeng County (since March 1, 2005) combines a basic rate and a higher rate for over use. For household users, 2.3RMB/cu.m for the basic use below 5cu.m, while 2.5RMB/cu.m for the part above 5 cu.m. For municipal users, 2.5RMB/cu.m for less than 10cu.m and 3.0RMB/cu.m for additional water use. For industrial users, 2.3 RMB/cu.m for less than 15cu.m and 3.5RMB/cu.m for the over part; for the commercial users, 3.0RMB/cu.m for less than 15cu.m, 3.5RMB/cu.m for the rest. For special users, 3.5RMB/cu.m for less than 20cu.m, 4.0RMB/cu.m for the rest (Zhenfeng Water Supply Company, personal communication, January 10 of 2007).

problems with implementation of water price policies of Guizhou Province are not unlike experiences in several other provinces.

Endowed with large water resources, Guizhou Province has established over 89 thousands hydraulic facilities (e.g. reservoirs, dams, pumps, etc.) since 1949. But raw water from these facilities was not subjected to a fee until 1983, following the promulgation of the *Administrative Method on Charging and Using the Water Fee of Water Engineering System of Guizhou* (No.111 Policy Paper of Guizhou Government, 1983). Over the past two decades, the rate of water fees for water engineering systems has increased three times for agricultural use, while the rates for other uses (industrial, municipal, and hydroelectricity generation) were only adjusted once in 2000. Following the most recent water tariff rates, in 2003 a total water fee of over 50 million RMB (26.558 million RMB for agricultural users and 25.665 million RMB for municipal and industrial water consumers) was collected and used for maintaining and expanding the water engineering facilities. This is 45 times more than the total amount of water fees collected in 1980 and 13.8 times more than the water fees collected in 1985. The current rates are still at a rather low level and cannot cover the full costs of raw water provision and the cost of expanding and upgrading the water engineering facilities in Guizhou (ref. Table 3.3). The fees equal 34-56% of the water provision costs for the agricultural users, and 56-87% of the water provision costs for industrial and municipal users.

Besides the low rate of the raw water fee, the collection of raw water fee has encountered problems in practice, in particular the fee for the rural irrigation. According to Mr.Cai²⁸, the Director of Guizhou Hydraulic Engineering Administrative Bureau, four major reasons can be identified for these implementation problems. First, the geographic conditions of Guizhou (mountainous with scattered cultivated lands and irrigated areas) result in a higher cost of hydraulic projects, accompanied by difficulties in cost recovery. Second, the payment capacity of water users is quite low in Guizhou, due to the relative low GDP per capita. Third, a significant amount of farmers reject payment for raw water, following their perception that water is free for all. Finally, the intervention strategy of the local government, who request local water authorities to continue providing water even to farmers who don't pay, but don't provide financial support for water authorities to improve collection of raw water fees - contributed to low collection rates. Furthermore, the lack of a standard billing system also contributed to low collection rates of raw water fees (Guizhou Price Bureau, 2004).

²⁸ Personal communication, July 16 of 2007.

Table 3.2 Rates of Raw Water Fee of Water Resource System

Year of introduction	Charge rates of raw water provision (RMB/m ³)				
	Gravity	Irrigation use Pumping	Industrial use	Municipal use	Hydraulic power generation
1983	0.005-0.008	half rate of gravity	0.02-0.04	0.02-0.10	8% income of power generation
1986	0.005	gravity			
1989	6.5kg rice per mou ^a	irrigation			
2000	0.036-0.06		0.13-0.20rmb		
Raw water cost	0.107			0.23	0.05

Note: (a) In 1989, it was proposed to collect rice instead of money for agricultural water use; but it was forbidden after the national institutional reform of food supplies in 2004. This has resulted in a lower collection rate of raw water fee (the current rate of 40-50% compared to the rate of 80-90% in 1989-2003²⁹).

(Source: Guizhou Price Bureau, 2004)

In order to improve the water use efficiency, protect water resources and cover costs, Guizhou Province started to collect the water resource fee to various water consumers³⁰ at different rates (see Table 3.4) since January 1, 1993, following to the *Administrative Methods on Collecting and Administering Water Resource Fee of Guizhou Province* (No.55 Policy Paper of Guizhou Government, 1992). This policy paper stipulates that the water authorities at county level take charge of collecting water resource fees, which are administrated as governmental extra-budgetary funds (10% as provincial revenue, 20% as municipal revenue, and 70% as county revenue). However, the actual collected water resource fee was much lower than the amount that should have been collected. For instance, the collected water resource fees in 2003 added up to 13.91 million RMB, equaling only 13.9% of the total amount (100 million RMB). According to Mr. Li, Director of Water Resource Division of Guizhou Water Resource Bureau,³¹ four major reasons caused the low collection rate of water resource fees. First, the

²⁹ According to Mr. Cai; personal communication, July 16 of 2007.

³⁰ The water resource fee is not applied to users of irrigation water, rural households, and water consumption less than 50 cubic meters per month.

³¹ Personal communication, July 15 of 2007.

water authorities in some countries are encountering capacity problems, such as being understaffed and having incapable staff, resulting in an inadequate capacity for water resource fee management. Second, the country-level water authorities fall short in enthusiasm for collecting water resource fees, due to the fact that they lack usage right of water resource fees. Third, the country-level governments often promise exemptions of water resource fee for major investors in order to attract capital for local development. Finally, but not the least, higher governmental intervention are causing poor collection rates. For instance, both the General Office of State Council and the General Office of Guizhou Government issued special policy papers to exempt certain key institutional water consumers from paying their resource fee, such as national hydraulic/thermal power plants (e.g. Guizhou Wujiang Hydraulic Power Development Company) and the Guizhou Electric Power Company. It is estimated that about 50 million RMB of water resource fees are exempted every year due to this local, provincial and national governmental intervention. These exemption policies are also common in other provinces and have been identified as one of the main implementation problems of water resource fee approaches in China.³² This all raises questions as to whether the water resource fee approach is still an effective economic instrument to protect water resources. The national government seems to be aware of that. Recently, Vice-Premier Zeng Peiyan emphasized the importance of applying economic instruments to all users in order to protect water resources and specifically called for charging water resource fees at national power generation plants in similar ways as other water users.³³

³² For instance, about 200 million RMB was exempted annually for national power generation plants in Shandong Province at the turn of the millennium (Liu *et al.*, 2003). These exemptions are increasingly disputed. See for legal disputes on collecting water resource fees of a national power generation plant in Hunan Province: Cheng, 2005. And see for a similar legal dispute in Dahua County of Guangxi Province, *Chinese Economic Times*, January 11 of 2006.

³³ Speech of Vice-Premier Zeng Peiyan at the national teleconference on water tariff reform and water conservation, April 29, 2005, at: http://www.gov.cn/node_11140/2006-04/22/content_261147.htm.

Table 3.3 Rates of Water Resource Fee in Guizhou Province, 1993

	Surface water	Groundwater	Unit
Industrial use	0.02-0.04	0.03-0.05	RMB/m ³
Municipal use	0.01-0.02	0.02-0.03	RMB/m ³
Thermal power generation	0.001-0.005	-	RMB/m ³
Hydraulic power generation	0.001	-	RMB/Kwh
Other use*	0.01-0.03	0.02-0.04	RMB/m ³

(*) other use refers to water used for health care, tourism, fish breeding, farming lands, etc.

Recently, this national attention seems to affect water resource fee collection practices in Guizhou, at least as reported in local policy papers. In February of 2007, Guizhou Government issued the *Administrative Methods on Licensing Water Abstraction and Collecting Water Resource Fee* (No.99 Policy Paper of Guizhou Government, 2007)³⁴. This policy paper is expected to institutionalize and improve the management of water abstraction and water resource fee collection. It specifies the scope of water abstraction licenses and collecting water resource fees (irrigation use and scattered individual water users with a monthly use of less than 100 cubic meters are exempt from water resource fee); it further defines the roles and responsibilities of water authorities at different levels and requests a three-level tiered administration (provincial, municipal and country level) of water abstraction permits and water resource fee collection; it stipulates the procedure of setting the rates of water resource fee, which should be decided by provincial-level authority; and it calls for applying progressive rates for water resource fees. In the meantime, new classifications of water resource fees were detailed by the No.49 Guizhou Price Policy Paper of 2007, and the rates for different water use categories have tripled or more (see Table 3.5) since April 1, 2007. The policy paper is not only clear in requiring all major institutional users (including power generation plants) to pay

³⁴ This administrative method is the emendation of the *Administrative Methods on Collecting and Administering Water Resource Fee of Guizhou Province* (No.55 Policy Paper of Guizhou Government, 1992); also the reaction to the *PRC Water Law* (revised in 2002), the *Guizhou Implementation Regulations on PRC Water Law* (2005), and the latest *Ordinance on Licensing Water Abstraction and Collecting Water Resource Fee* (the State Council, 2006).

the water resource fee, but it also institutionalizes and discloses the fee collection system through strengthening the management of the so-called charging licenses³⁵, uniform bills for all users, and disclosing information to the public (such as the items of charge, rates of charge, license number, and telephone numbers of superintendents). While these government efforts in policy design for addressing water pricing problems are hopeful³⁶, it needs time to observe the actual implementation of these proposals for the water resource fee governance and their impact on fee collection, water management and protection of local water resources.

In addition to this, Guizhou province is attempting to use economic instruments to enhance and improve its wastewater treatment service. Compared to other Chinese regions, Guizhou province has a low capacity of wastewater treatment, with a wastewater treatment rate of 26.8% in 2005 (compared to a national average of 52%). By the end of 2006, 4 of the 87 cities and counties in Guizhou had not introduced a wastewater treatment charge scheme yet. The current wastewater treatment charges range from 0.10 to 0.30RMB/m³ and are required to increase to 0.6-0.8RMB/m³ according to the recent *Administrative Regulation on Collecting Urban Wastewater Treatment Charge of Guizhou* (No.3 Policy Paper of Guizhou Price Bureau, Guizhou Construction Bureau, Guizhou Finance Bureau, and Guizhou Environment Protection Bureau, 2007). These wastewater treatment charges cover only part of the cost for further developing wastewater treatment facilities. For instance, it is estimated that a total investment of about 2000 million RMB is required for developing wastewater treatment facilities in the provincial capital Guiyang in 2008-2010, in order to meet the goal of 80% wastewater treated by the end of 2010.³⁷

³⁵ The organizations in charge of collecting water resource fees have to apply or update the charging license to the price authorities at the same level.

³⁶ For instance, Mr. Li of the provincial water authority, believes to collect about 200 million RMB annually of water resource fees, following the new requirements of No.99 Policy Paper of 2007 (personal communication, July 15, 2007).

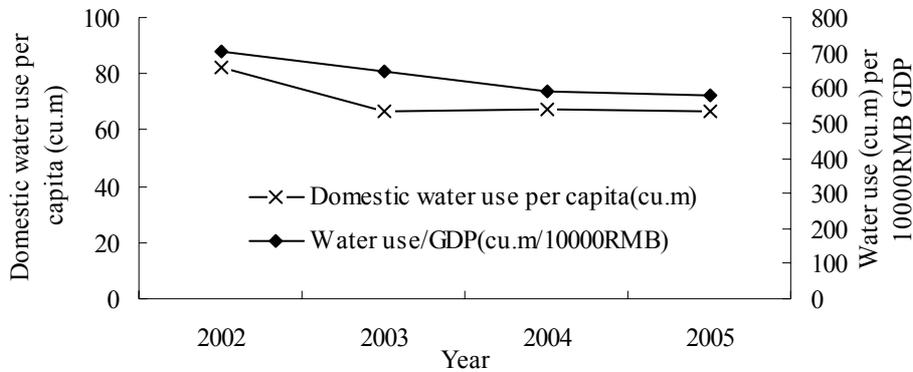
³⁷ Guizhou Urban Daily [*Guizhou Dushi Bao*], June 22 of 2007.

Table 3.4 Rates of Water Resource Fee in Guizhou Province, 2007

	Surface water	Groundwater	Unit
General industrial use	0.06	0.12	RMB/m ³
General municipal use	0.04	0.08	RMB/m ³
Municipal water supply enterprises	0.04	0.08	RMB/m ³
Thermal power generation			
Cooling mode: Closed cycle	0.01-0.02	0.02-0.04	RMB/m ³
Cooling mode: Uniflow opened cycle	0.001-0.002	0.002-0.004	RMB/m ³
Hydraulic power generation			
Large-size Plants	0.01-0.015	0.015	RMB/Kwh
Medium-size Plants	0.007-0.011	0.011	RMB/Kwh
Small-size Plans	0.004-0.007	0.007	RMB/Kwh
Bottled water producer	0.07	0.14	RMB/m ³
Geothermal water users		0.2-0.5	RMB/m ³
Groundwater abstraction from overdraught regions		2	RMB/m ³
Self-supplying wells in the areas covered by the public water supply networks		0.2-0.5	RMB/m ³
Others	0.05	0.10	RMB/m ³

Overall, Guizhou Province has experienced a quick increase in the urban water tariff, in particular after 2003 (Zhong and Mol, forthcoming). The current average rates of water tariff (including WWTC) of 87 cities and counties are 1.84RMB/m³ for household users (ranging from 1 to 3.41RMB/m³), 2.214RMB/m³ for administrative users (ranging from 1 to 4.68RMB/m³), 2.312RMB/m³ for industrial users (ranging from 1.25 to 4.68RMB/m³), 2.927RMB/m³ for business users (ranging from 1.5 to 6.5RMB/m³), and 5.135RMB/m³ for special users (ranging from 1.7 to 10.4RMB/m³). Following the recent increase in water resource fee, Guiyang City increased its urban water tariff sharply since July 1, 2007. The water tariff rate for household users increased from 1.4 to 2.2RMB/m³ (increase of 57%), including an increase of 0.3RMB/m³ for WWTC. It is argued that this new water tariff increases have a positive impact on improving the water use efficiency and protecting water

resources. As shown in Figure 3.6, both the water use per GDP and the domestic water use per capita shows a modest decreasing trend over 2002-2005.



(Source: Guizhou Water Resource Bureau, Official Gazette on Guizhou Water Resource, 2003-2006; at: www.gzmwr.gov.cn)

Figure 3.6 Water Use for Households and Industries in Guizhou Province, 2002-2005

Guizhou Government has made considerable policy efforts to introduce economic and pricing instrument into the field of water management, ranging from price increases for raw water abstraction, a water resource fee to wastewater treatment charges. However, the empirical experience in Guizhou has demonstrated that natural resource pricing policy is not just a matter of increasing prices, but a complicated process involving institution building, improving governmental capacity, decreasing conflicting governmental interventions, and making cost and collection systems transparent. With respect to these latter aspects, water reform in Guizhou is only starting.

3.5 Conclusions

As is evident from our analysis of water price reforms in urban China over the last two decades, major advances have been made in increasing the tariff of an initially free natural resource. In

that sense China is rapidly catching up with many OECD countries by developing an advanced system of pricing water resources and water use, in order to meet various goals: covering increasing costs, protecting scarce natural resources, and introducing economic stimuli for efficient use of these resources.

As in most countries, also in China the use of economic instruments offers several (potential and actual) benefits in urban water governance such as increased revenues, more available funding, and a decrease in water consumption per capita or unit of GDP. But the application of economic and pricing instruments in China's water governance is also facing major challenges, related to a necessary perception change of recognizing that water is also an economic good, the willingness to pay significantly for water, the capacity to pay especially for the urban and rural poor, and – last but not least - the institutional lay-out necessary for successful implementation. While environmental and natural resource economists as well as ecological modernizationists argue for the theoretical pre-eminence of these economic approaches to combat various water challenges, the Chinese experiences teach us that using economic instruments in urban water management is a complicated process. It does not just imply changes in water tariffs, but also has to include institutional reforms in water regulation, collection systems, financial management, governmental subsidies, public participation, and social and equity issues. And these latter aspects often prove crucial for solving urban water problems.

Currently, the implementation of economic or pricing instruments for water management is emerging. At this early stage of development attention is mainly directed the economics of setting 'right' prices, and less to the institutional aspects that come along with implementation and governance. As the institutional lay-out is key to a successful use of economic and pricing instruments to solve water problems (cf. Andersen, 1994; van Vliet, 2002), the slight improvement of water use efficiency following significant water price increases in Guizhou and other provinces illustrate the need for more and better professional staff; more advanced and uniform systems of monitoring and billing; improvement of accountability, transparency, and public participation in the policy-making and implementation; and further attention to policy integration. Recent developments in Guizhou with respect to water resource fees point in this direction. The newly installed institution of public hearings for setting water tariffs (cf. Zhong and Mol, 2007) and various experiments with public-private partnerships in urban water governance can also be seen as indications that ecological modernization processes in China's

water reform are moving away from a one sided economic-technological process toward a multi-sided governance innovation.

References

- Andersen, M.S., 1994. *Governance by Green Taxes: Making Pollution Prevention Pay*, Manchester University Press: UK
- Andersen, M.S., and I. Massa, 2000. Ecological modernisation: Origins, dilemmas, and future directions, *Journal of Environmental Policy and Planning*, 2, 337-345.
- Boland, J.J., 1997. *Pricing urban water: Principles and compromise*, Paper presented at the World Bank seminar on Pricing of Sanitation and Water Services, February 18-19, 1997.
- Chen, Y.M., 2005. *An administrative reconsideration case and the effectiveness of the State Council policy documents* (in Chinese), at: <http://www.chinalaw.gov.cn>.
- Chinese Economic Times, 2006. *Dahua: Collection of water resource fee encountering policy problems*, January 11 of 2006), at: <http://hwcc.com.cn/newsdisplay/newsdisplay.asp?Id=143070>, (in Chinese).
- Christoff, P., 1996. Ecological modernisation, ecological modernities, *Environmental Politics*, 5:476-500.
- General Office of the MOC, 2005. Survey Report on the Cost of Water Supply Companies of Key Cities (1999-2003), *Investigation, Research and Information*, No.13, March 25 of 2005 (in Chinese).
- Guizhou Price Bureau, 2004. *Review of Guizhou Water Tariff Reform* (in Chinese).
- He, J.Y., and R.H. Wu, 2001. Theory of ecological modernization and current environmental decision-making of China, *J. Chinese Population, Resources and Environment*, Issue 4 of 2001, Jinan, (in Chinese).
- Huang, Y.N., and P., Ye, (2001), "A Review on the Ecological Modernization Theory in Western Countries", *Foreign Social Science*. 2001 (4):1-6 (in Chinese).
- Kim, H. Youn, 1995. Marginal cost and second-best pricing for water services, *Review of Industrial Organization*, 1995 (10): 323-338.
- Liu, W.P., G.X. Wang, E.H. Guan, G.B. Jiang, and X. Chen, 2003. A survey on collecting and managing water resource fee, *China Water Resource*, 2003 (5) (in Chinese).
- Liu, Y., 2005. *Phosphorous Flows in China. Physical Profiles and Environmental Regulation*, Wageningen: Wageningen University (PhD thesis)

- MOC, 2005a. *Notice on the Status Quo of National Urban Wastewater Treatment*, September 7, 2005 (in Chinese).
- Mol, A.P.J., 1995. *The Refinement of Production: Ecological Modernization Theory and the Chemical Industry*, Utrecht: International Books (PhD thesis)
- Mol, A.P.J., 2006. Environment and Modernity in Transitional China: Frontiers of Ecological Modernisation, *Development and Change*, 37 (1): 29-56.
- Mol, A.P.J., and D.A. Sonnenfeld, eds., 2000. *Ecological Modernization Around the World: Perspectives and Critical Debates*, London: Frank Cass.
- Mol, A.P.J., and G. Spaargaren, 2000. Ecological Modernization Theory in Debate: A Review, *Environmental Politics*, 9 (2000) 1: pp17-50.
- MOWR, 2005. 2005 Water Conservancy Statistics Yearbook, In: http://www.chinawater.net.cn/cwsnet/CWSArticle_View.asp?CWSNewsID=26851, (in Chinese).
- OECD, 1997. Pricing of water services.
- OECD, 1999. Pricing of water services: An update.
- Postel, S., 1993. Facing water scarcity, in *The State of the World*, ed. L. Brown (New York: W.W. Norton).
- REC (Regional Environmental Center for Central and Eastern Europe), 2001. *Environmental Taxes in an Enlarged Europe: An Analysis and Database of Environmental Taxes and Charges in Central and Eastern Europe*, The Regional Environmental Center for Central and Eastern Europe, Hungary.
- Renzetti, S., 1992. Evaluating the welfare effects of reforming municipal water prices, *Journal of Environmental Economics and Management* 22, 147-63.
- Renzetti, S., 1999. Municipal water supply and sewage treatment: Costs, prices, and distortions, *The Canadian Journal of Economics*, Vol. 32, No.3 (May 1999): 688-704.
- Rogers, P., R. de Silva, and R. Bhatia, (2002), Water is an economic good: How to use prices to promote equity, efficiency, and sustainability, *Water Policy*, 2002(4): 1-17.
- NDRC, and MOC, 2003. *Survey Report on the Industrialization and Marketization Reform of Wastewater Treatment and Solid Waste Disposal in China* (in Chinese).
- Seippel, Ø., 2000. Ecological modernization as a theoretical device: strengths and weaknesses, *Journal of Environmental Policy & Planning*, 2: 287-302

- Seroa Da Motta, R., A. Thomas, L.S. Hazin, J.G. Feres, C. Nauges, and A.S. Hazin, 2004. *Economic Instruments for Water Management: The Cases of France, Mexico and Brazil*, Massachusetts: Edward Elgar Publishing, Inc.
- Sonnenfeld, D.A., and A.P.J. Mol, 2002. Globalization and the Transformation of Environmental Governance: An Introduction, *American Behavioral Scientist*, 45, 9, pp.1318-1339
- Spaargaren, G., 2000. Ecological Modernization Theory and Domestic Consumption, *Journal of Environmental Policy & Planning* 2, 1, pp.323-335.
- Tatenhove, J., B. Arts, and P. Leroy, eds., 2000. *Political Modernisation and the Environment: The Renewal of Environmental Policy Arrangements*, Dordrecht/Boston/London: Kluwer Academic Publishers.
- USEPA (Environmental Protection Administration of US), 2004. *International experiences with economic incentives for protecting the environment*, US: Washington DC.
- van Vliet, B., 2002. *Green the Grid: The Ecological Modernization of Network-bound Systems*, Wageningen: Wageningen University (PhD thesis).
- Wang, Y.H., 1999. The status quo and reform strategies of water price in China, Proceeding of International Workshop on 21st century Chinese Urban Water Management, organized by the MOC and UNDP, Beijing, China, 1999.
- Winpenny, J., 1994. *Managing Water as an Economic Resource*, London: Routledge.
- Wu, W.J., 2001. *Study on Measurements and Institutions for Pricing Water*, Nanjing: Hohai University (MSc thesis, in Chinese).
- Zhang, L., 2002. *Ecologizing Industrialization in Chinese Small Towns*, Wageningen: Wageningen University (PhD thesis).
- Zhang, L., A.P.J. Mol, and D.A. Sonnenfeld, 2007. The Interpretation of Ecological Modernization in China, *Environmental Politics*, 16, 4, pp. 659-668.
- Zhang, L.Z., 2005. *Urban Water Tariff Study: Impact Factors and Policy Analysis*, Beijing: Tsinghua University (MSc thesis, in Chinese).
- Zhong, L.J., and A.P.J. Mol, 2007. Participatory environmental governance in China: Public hearings on urban water tariff setting, *Journal of Environmental Management*, forthcoming, doi:10.1016/j.jenvman.2007.04.018.

Chapter 4 Public-Private Partnerships in China's Urban Water Sector³⁸

Abstract

During the past decades, the traditional state monopoly in urban water management has been debated heavily, resulting in different forms and degrees of private sector involvement across the globe. Since the 1990s, also China has started experiments with new modes of urban water service management and governance in which the private sector is involved. It is premature to conclude whether the various forms of private sector involvement will successfully overcome the major problems (capital shortage, inefficient operation, and service quality) in China's water sector. But at the same time, private sector involvement in water provisioning and waste water treatments seems to have become mainstream in transitional China.

Key words

Public-private partnership, water governance, China

4.1 Introduction

In the wake of the UK water privatization in the 1980s, the 1990s witnessed the spreading of privatization and a variety of public-private partnership (PPP) constructions in developing countries, especially following the promotion and push by international development agencies such as the World Bank, the International Monetary Fund (IMF), the Asian Development Bank (ADB) and others (Nickson, 1996, 1998; Kikeri and Kolo, 2006). It was believed that private sector participation in the water sector would bring in much needed investment and improve service coverage, quality and efficiency, by replacing conventional public-sector systems suffering from under-investment and inefficiencies due

³⁸ This chapter contains an accepted article for publication by *Environmental Management*, as Zhong, L., A.P.J. Mol, and T. Fu, Public-private partnership in China's urban water sector.

to excessive political interference and rent-seeking behavior by vested state and bureaucratic interests (Hall and others, 2005). During the past decades, a wide literature in economics, governance and public management have provided theoretical and empirical arguments and evidence in favor of further private sector involvement in what used to be public utilities. But at the same time debate continues on the different partnership constructions, the division of tasks and responsibilities between public and private sectors, and the social effects coming along with these developments. Topics, such as the relationships between ownership (public or private) and efficiency (Vining and Boardman, 1992; Spiller and Savedoff, 1997; Birchall, 2002; Afonso and others, 2005; Anwandter and Jr.Ozuna, 2002; Hart, 2003), the classification of various public – private constructions and their characteristics (World Bank, 2004; Seppälä and others, 2001; US National Research Council, 2002), the consequences of privatization for governmental regulation (Nickson and Vargas, 2002; Pongsiri, 2002) and questions of equity and equality are still heavily debated, in particular with respect to the water sector and less so regarding other utilities.

Although private sector participation in the water sector is one of the more controversial topics in public utility management today, this wave also spread to China at the turn of the millennium, where the government started to reform public sectors (water, electricity, roads, etc.) via introducing market functions. The so-called marketization reform expected to address the increase of several water problems (water shortage, insufficient infrastructure, water pollution, etc.) to meet the requirement posed by accelerated urbanization and high economic growth. As a late comer in this field of private sector involvement in the provision of water services, China is able to learn from numerous experiences of other countries such as the UK, France, US, Chile, Philippines, Mexico, Argentina, Bolivia.

Since the earlier attempts of applying the Build-Operate-Transfer (BOT) approach in the water sector in the 1990s and the full development of marketization reform in public sectors in 2002, China has applied different models of private sector involvement in over 300 water supply and wastewater projects. This marketization reform emphasizes the importance of the market, investment and financial liberalization, deregulation, decentralization, and a reduced role of the state in the water sector (also see Robison and Hewison, 2005; Prasad, 2006). Tariff reform with full-cost recovery, competitive bidding

procedures, changing ownership structures (e.g. public and private, Sino and foreign), and restrictive fiscal policies are part of it.

This paper reviews developments in private sector involvement in China's water management and assesses whether expected results of marketization in the Chinese water sector have been met: raising investment for infrastructure, increasing service coverage and improved efficiency in China's water supply and wastewater treatment. After interpreting further private sector involvement in China's urban water management in terms of modernizing water governance, this paper provides a country-wide overview of current privatization developments in the Chinese water sector, and subsequently makes an in-depth investigation in three distinct cases with respect to the new roles and functions of the governments and private parties. The final section assesses the current status of privatization programs in China's water management and its implications of future research on water governance reform.

4.2 Private Sector Participation as Part of Modernizing Urban Water Governance

In the debate on private sector participation in environmental governance in general, and urban water governance in particular, we can identify three – sometimes interrelated - discourses.

First, private sector participation goes back to the literature on state failure in the early 1980s. State failure refers to the notion that the nation-state falls short in the provisioning of collective goods, in this case environmental services and quality. Some of the key publications in this regard come from Germany. Martin Jänicke's (1986) *Staatsversagen* analysed the fundamental inability of the nation-state to protect the environment in the 1980s, and called for an innovation or modernization of environmental politics, later to be labelled political modernization (e.g. Tatenhove and others, 2000; Mol, 2002): a reorientation towards a more preventive, pro-active and flexible strategy using new instruments and closer cooperation with and participation of non-state actors. With a similar analysis of the environmental state's fundamental inabilities, Joseph Huber (1985) came to

slightly different solutions with his strong plea for involving the private sector into environmental services and protection. Finally, around the same time Ulrich Beck (1986) formulated his Risk Society hypothesis and identified subpolitical arrangements (that is: arrangements for environmental protection and service provision without and beyond the public state) as an alternative for the conventional environmental politics of the nation-state. Inspired by these and several other authors and ideas, from the mid 1980s onwards environmental social science scholars started to develop ideas, investigate practices and formulate theories on governing environmental problems, in which the environmental state was given a less dominant and monopolistic position.

Around the same time (the second half of the 1980s) ideas of further private participation and involvement in the provisioning of environmental services (water, waste, energy, etc.) started to develop, especially in the US and the UK. While also here the fundamental idea is involving the private sector in tasks traditionally fulfilled by the public sector, the orientation and literature is slightly different. The majority of the literature comes from the management and organization sciences and the orientation is less focused on state failures and governance, but rather on efficiency, the bringing in of new capital and the introduction of market logics. The dominant form of organizing urban infrastructure (water, energy, waste, transport) by state agencies has been replaced in many places by various PPP constructions, with different reasons put forward to legitimate such new constructions (cf. Linder, 1999). At the same time these partnerships led to considerable debate, most significantly on issues of equity and equality: who is involved in these partnerships, for who are these constructions bringing more effective and efficient services, are local governments able to balance the power of private capital coming in (especially in situations of Transnational Companies TNCs in developing countries) (e.g. Oppenheim and MacGregor, 2004), and what does private sector involvement mean for affordability of environmental services for the poor?

Thirdly, in the 1990s, following the United Nations Conference on Environment and Development (1992, Rio de Janeiro), and even stronger after the Rio+10 conference (2002, Johannesburg), ideas and practices of public private partnerships started to emerge forcefully on the national and global agenda (cf. Mol, 2007). In this literature, the emphasis is strongly on transnational partnering of public and private entities, with a strong focus on the role of civil society organizations. The main reason behind the recent attention to

private sector participation in environmental protection and service delivery is related to tendencies of globalization and governance complexities. As Davies (2002) correctly summarizes, in this interpretation the notion of partnership has a positive rhetoric referring to inclusiveness, transparency, participation and dialogue, redistribution of power, and equity. And not so much to ideas of efficiencies, capital investment, market logics, and increased service coverage.

In reviewing the arguments and legitimacy of the push for private sector involvement in China's urban water governance, there is a strong relation to the second discourse on efficiency, capital investments and service coverage, while ideas of state-failure and political modernization incidentally emerge. By the same token, the Chinese discourse on private sector participation in urban water management hardly draws upon ideas of wide cross-sectoral partnerships and the positive logics of transparency, democracy, participation and dialogue. Discussions on China's urban water governance reform argue for the advantages of effectiveness and efficiency, and debate the best organizational modes, division of responsibilities, and coordination structures. Potential negative outcomes of private sector participation - so strongly emerging in and dominating western debates - are much less emphasized: loss of decision-making autonomy of states and governments; unequal power relations and information asymmetry in public-private partnerships; problems around equity, access for the poor, participation and democracy in decision-making (e.g. Hancock, 1998; Poncelet, 2001; Miraftab, 2004).

According to the World Bank, China, Chile and Colombia are the only countries that remain active in water privatization after 2001 (Izaguirre and Hunt, 2005). How to explain that, while the activities of water sector privatization intend to shrink in an increasing number of countries and international development agencies such as the World Bank start to slow down such privatization programs, China is actively promoting private sector involvement in urban water governance? Two interdependent arguments elucidate this. First, China's urban water management comes from a radically different starting position, where market principles and logics were almost absent. Water management was not just completely publicly organized but also highly inefficient, with large capital shortages, poor coverage, no economic incentives and demand side management, and highly centralized. This is a fundamental rather than marginal difference with most of the public utility systems in OECD countries before the privatization discourses and practices of the 1980s

and 1990s. Under such Chinese conditions private sector involvement in water management means more than just handing water business over to for-profit private companies. It most of all means building economic incentives and logics, safeguarding enough financial capital for infrastructure investments, and widening the service area. Second, private sector participation in China's urban water management is not just a matter of privatization. It is part of a much wider and complex modernization program in urban water governance, involving some of the critical issues that emerged in the privatization debates in OECD countries. The modernization of urban water governance also includes (see OECD, 2003, 2004a, 2004b, 2004c, 2005a, 2005b):

- water tariff reforms, where costs of drinking water increasingly include full costs (also of wastewater treatment), but come along with safeguards for low income households to continue access to drinking water;
- transparency, accountability and control of the government;
- public participation in for instance water tariff setting, complaint systems on water pollution and corruption, public supervising committees on utility performance, public and media debates on water governance, disclosure of information to non-governmental actors (cf. Zhong and Mol, 2007); and
- decentralization of water tasks and responsibilities to the local level.

In exploring the degree, nature and forms of private sector participation in China's urban water governance in the following sections; we have to leave these wider – related - developments aside.

4.3 Privatization Policy in China's Water Sector

In China, the term "private sector" has been regarded as politically sensitive since 1949 when China started to establish a socialist regime characterized by the nationalization of ownership. The first breakthrough of the development of 'private sector', which was officially defined as 'economic organizations that aim at making profit, in which assets are privately owned and which have eight or more employees' (Provisional Regulations of Private Enterprises in PRC, the State Council, June 25 of 1988), took place mainly in

competitive sectors in accordance with the launch of China's economic reform in the late 1970s. The government remained in control of public sectors such as water services, energy provisioning, waste management, and public transport. In the mid 1990s, Chinese Government attempted to introduce the BOT approach into the field of urban infrastructures (thermal power, hydropower, highway, water supply, etc.) via promulgating the *Circular on Attracting Foreign Investment through BOT Approach* (No.89 Policy Paper of 1994, the former Ministry of Foreign Trade and Economic Cooperation, January 16 of 1995) and the *Circular on Major Issues of Approval Administration of the Franchise Pilot Projects with Foreign Investment* (No.208 Policy Paper of Foreign Investment, the former National Development and Planning Commission, the Ministry of Electric Power Industry, and the Ministry of Communications, 1995). These two policy papers formed a first legal ground for private sector involvement and foreign capital investment in Chinese urban infrastructure. Subsequently, the National Development and Reform Commission firstly approved three BOT infrastructure projects in 1996, including Chengdu No.6 Water Supply BOT Plant (B), Guangxi Laibin Power BOT Plant and Changsha Wangcheng Power BOT Plant (failed).

The earlier experiences of BOT projects brought in needed capital and investment to develop China's urban water infrastructure. But it illustrated also many problems. The issue of the fixed investment return to investors was one of these problems. After intensifying control over foreign exchanges and loans in the late 1990s, the General Office of the State Council promulgated a specific circular in 2002 to correct foreign investment projects with fixed investment returns, by modifying the relevant contract terms, buying back all shares of foreign investors, transferring foreign investment into foreign loans, or dismantling contracts with often severe losses.

The full-fledged commitment of the Chinese government to private involvement in the water and other utility sectors dates from late 2002. In the December of 2002, the *Opinions on Accelerating the Marketization of Public Utilities* (No.272 Policy Paper of the MOC, 2002) started the marketization reform of water and other public sectors by opening public utilities to both foreign and domestic investors: multi-financing approaches, concession right and concession management, pricing mechanism, reduction of governmental monopolies and roles ended the traditional policies of public utilities. The subsequent *Measures on Public Utilities Concession Management* (No.126 Policy Paper of

the MOC, 2004; in this policy, ‘concession management’ refers to all forms of private sector participation.) of 2004 specifies the procedure of how to involve the private sectors in public utilities through awarding concession right, but still relies heavily on BOT modes.

These steps proved more than just giving the private sector a permission to enter public utilities. It is a complex process involving among others ownership reforms, redefinition of the role of governments and operators, restructuring the tariff mechanism, reforming governmental regulation, and designing public participation. In the early years of marketization the emphasis was especially on market opening and financing issues. With *Opinions on Strengthening Regulation of Public Utilities* (No. 154 Policy Paper, the MOC, 2005) the neglect of governmental regulation and the public good character of water in the previous policy papers was corrected. This policy paper emphasizes the water sector provide basic public and social goods and that the governmental regulation remains essential (Fu and Zhong, 2005). However, there is still a lack of a systematic and comprehensive regulatory framework for the Chinese urban water sectors in practice. The MOC is attempting to introduce and develop a competitive benchmarking system that might be helpful for further regulation, but this is not yet in place. During the authors’ field surveys, the local officials of relevant water authorities are laboring under the lack of effective measurements for regulatory framework, have too much freedom of (non)regulation, and have sometimes an incorrect perception of the government role as a regulator. Fu and colleagues (2006) also refer to the fact that the government has paid some attention to assets regulation while restructuring ownership in the water sector, but neglected regulating water service quality.

Compared to the exponential growth of water projects with significant private sector involvement, the legal basis under privatization developed quite slow and is still underdeveloped in China. Different from some water privatization forerunner countries (e.g. England and Wales, Philippines), which enacted specific laws before entering into privatization, the marketization reform of and private participation in the Chinese water sector is conducted under various governmental policy papers, but without specialized legislation. The current legal codification of public-private partnering in water services is largely a reactive process, where various policy papers address specific problems in the reform process due to the lack of a well-established legal framework. Thus, much room for improvement remains in the current legal basis, for instance on further economic regulation,

stronger legislative sanctions, and public participation (cf. Tong, 2005; Zhang, 2006; Fu and Zhong, 2005; Fu and others, 2005).

As implementation problems were slowly or not adequately addressed or resolved at the national level, local governments started to issue local policy papers on specific water projects. For instance, the *Interim Provision on Adminstrating Concession Right of Chengdu* (No.131 Policy Paper of Chengdu Municipality, 2001) was issued for implementing the BOT project of Chengdu No.6 Water Supply Plant (B), which was the first water BOT pilot project approved by the NDRC. And the *Measures on Public Utilities Concession Management of Shenzhen* (No.124 Policy Paper of Shenzhen Municipality, 2003) guided the reform of Shenzhen Water Group, the largest water project with private sector involvement in China to date.

4.4 The Current Landscape of Private Sector Involvement

In China's water supply and wastewater services, four major types of private corporations are active (Fu and others, 2006): (i) the water transnational corporations (water TNCs such as VEOLIA and SUEZ); (ii) Chinese investment developers (such as Beijing Capital Group and Tianjin Capital Environmental Protection Co. Ltd.); (iii) liberalized water companies (such as Shenzhen Water Group and Beijing Sewerage Group); and (iv) environmental engineering corporations (such as Beijing Sound Group and Tsinghua Tongfang Water Engineering Corporation). In December of 2004, the Ministry of Construction called provincial-level authorities to summarize marketization of public sectors (e.g. water and wastewater, solid waste, gas, and public transportation). In July of 2005, a follow-up field survey was organized by the MOC, in which the authors have participated. All reported data of this section come from the reports of provincial-level authorities, supplemented by surveys of the Water Policy Research Center of Tsinghua University (in which authors participated).

According to the MOC surveys, various forms of private sector participation can be identified in both water supply and waste water treatment: commercialization of public utilities, management contracts, lease contracts, Greenfield (BOT-type contracts), concession contracts, joint ventures, and full sale (or full divesture). Table 4.1 summarizes

the various forms of private sector participation and their characteristics. Up till July 2005, in total 152 water supply projects and 200 wastewater treatment projects involved private participation. The total water production capacity of the 152 water supply projects equalled about 17% of national water production capacity of 2004. The treatment capacity of the 200 wastewater projects was over 30 million cubic meters per day, equalling 67% of the national total water treatment capacity of 2004.

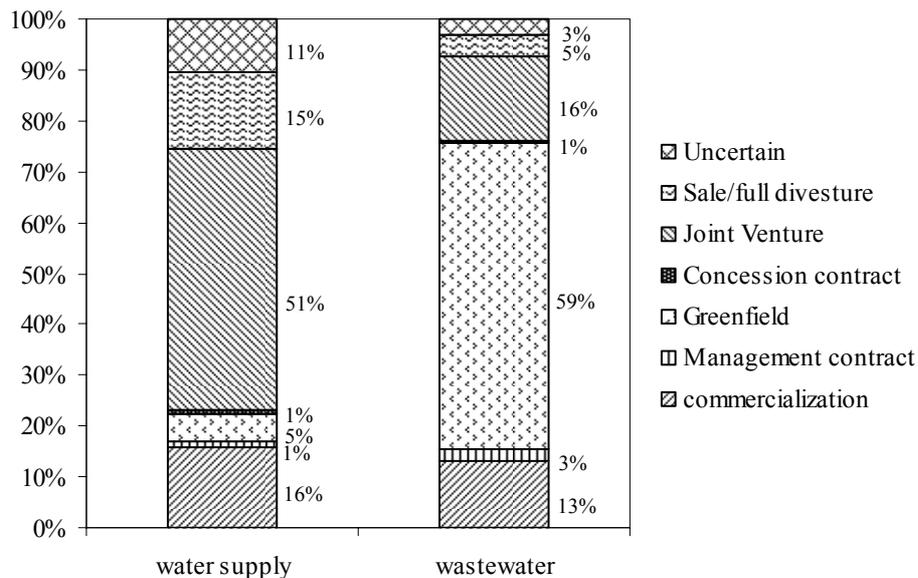
Table 4.1 Different Forms of Private Sector Participation in China's Water Sector

Form of private sector participation	Asset ownership	Capital investment	Operations & maintenance	Contract period
Commercialization of governmental enterprises/utilities	Public	Public	Public	Indefinite
Management contract	Public	Public	Private	3-5yr
Lease contract	Public	Public	Private	8-15yr
Greenfield (BOT-type)	Private/ public	Private	Private	20-30yr
Concession	Public	Private	Private	25-30yr
Joint Venture	Shared	Shared	Shared	Indefinite
Full Sale or divesture	Private	Private	Private	Indefinite

Notes: **Commercialization** is the transformation of a public agency/utility into an independent corporation. **Management contract** (or namely operations and maintenance contract) refers to a contractual arrangement in which a private operator manages and maintains the service in a given period but does not have investment obligations. **Lease contract** is a short-term contract in which a private operator pays an agreed-upon fee to the government for the right to manage the facility. **Greenfield contract** (such as BOT, TOT, BOOT, and etc.) mean the government commits new investment projects to a private company; within the contract duration, the private operator manages the infrastructure and the government purchased the water by a contracted price (this price isn't necessarily determined by the actual water tariff). **Concession contract** is a long-term contract in which a private operator bears responsibilities for operations and maintenance and also assumes investment and service obligations. **Joint Venture** is not a contract but, rather, an arrangement

whereby a private company forms a legal entity with the public sector, in which both the private and the public parts share responsibilities and (investment) obligations. *Full sale or divesture* is the sale of public assets to the private sector.

Figure 4.1 shows the prevalence of different forms of private sector participation in water supply and in wastewater projects. The joint venture approach (including the Sino-foreign joint ventures) has the largest share in the water supply sector with 51% of the 152 privatized projects. The Greenfield modes of private sector participation (including the BOT and TOT contracts) dominated in the wastewater sector, with 59% of the 200 projects. The commercialization of governmental utilities also plays an important role in both water supply (16% of 152 projects) and wastewater (13% of 200 projects). The differences in prevalence of private sector participation forms between water supply and wastewater have a close relation with the level of infrastructure development and with tariff levels. Compared to urban water supply (with service coverage of 88.8%), urban wastewater treatment lags behind, with a service coverage of 45.6% in 2004 (MOC, 2005). Direct investment demand for urban wastewater infrastructure (including wastewater treatment, sewers, and sludge treatment) in China is expected to be over 30 billion US dollars between 2006 and 2010, to meet the objective of 60% municipal wastewater to be treated. Accordingly, local governments prefer direct private sector investment in and building of new wastewater infrastructure, resulting in high levels of the Greenfield modalities. In addition, the current low wastewater treatment charges result in a preference for Greenfield modes. In these modes, financing is based on negotiated prices between the government and the private sector and is less dependent to the user fee or charge; for drinking water supply costs are much better represented in prices, making joint ventures more likely (Zhong and others, 2006).



Source: MOC survey, 2005

Notes: 'Uncertain' refers to projects with private sector participation, but with unknown form.

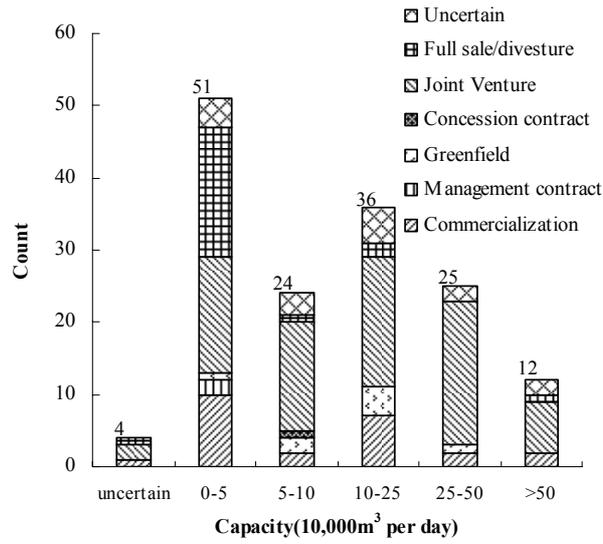
Figure 4.1 Private Sector Participation in Water: Distribution over Modalities, 2005

Figure 4.2 categorizes public sector participation into five groups, according to project capacity. The joint venture approach leads the reform of water supply sector in all size-categories, while the Greenfield approach dominates in wastewater sector, except for projects over 500,000m³ per day. This might also be related to the different financial risks. Larger projects require much more direct capital investment from the private sector, increasing the financial risk of for private investors and moving then rather towards joint venture approaches. Furthermore, the full sale/divesture approach occurred more in the field of water sector and mainly in small projects in specific provinces (see Figure 4.3). And commercialization is more often found among larger projects. This might be related to not only the larger capital demands of bigger projects, but also huge labor redundancies within such large projects. Existing large water projects are traditionally run by state-owned enterprises with high levels of superfluous workers. For private investors it is often difficult

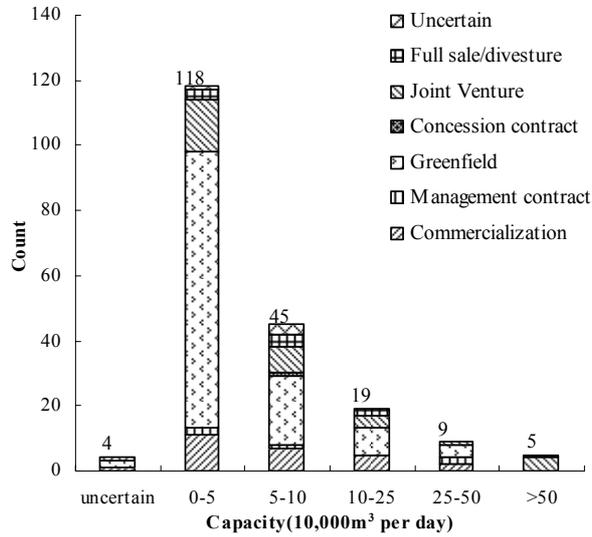
to improve efficiency, because government contracts often do not allow firing existing workers following a commercialization process.

Figure 4.3 visualizes the provincial distribution of water projects with private sector participation. At least 25 provinces have private sector participation experience in water supply and 23 provinces in wastewater treatment. The form of private sector participation is determined by the level of development of water/wastewater infrastructure, as well as the local economic, social and political conditions. With richer markets, more open economic policies and higher payment capacity of local residents, the southern coastal (e.g. Guangdong and Fujian) and the eastern coastal (e.g. Jiangsu) provinces witnessed high levels of reform in their water sector. Over 60% of foreign private sector investment in water supply projects and about 50% foreign private sector investment wastewater projects were implemented in these coastal regions, according to the MOC survey. In the meanwhile, the first national BOT pilot project of Chengdu Water Supply (Sichuan Province) has triggered a wave of private sector participation in and around Sichuan Province (including Chongqing and Yunnan). Furthermore, the special environmental protection policies related to “The Three Gorges” dam might have impelled private sector participation in wastewater sector of Sichuan Province and Chongqing.

As shown in Figure 4.3, in water supply the joint venture approach dominates in 19 provinces. In the wastewater sector Greenfield projects (including BOT and TOT) dominate in 12 provinces. The commercialization of traditional state-owned water enterprises was adopted more widely in inland provinces (such as Gansu, Heilongjiang, Jilin, Sichuan, Xinjiang, Yunnan) than in coastal provinces. A joint venture approach for private sector involvement in the wastewater sector was only adopted in provinces with a high wastewater treatment charges, such as Beijing, Fujian, Jiangsu, Zhejiang, and Shanghai.



(a) Water supply projects

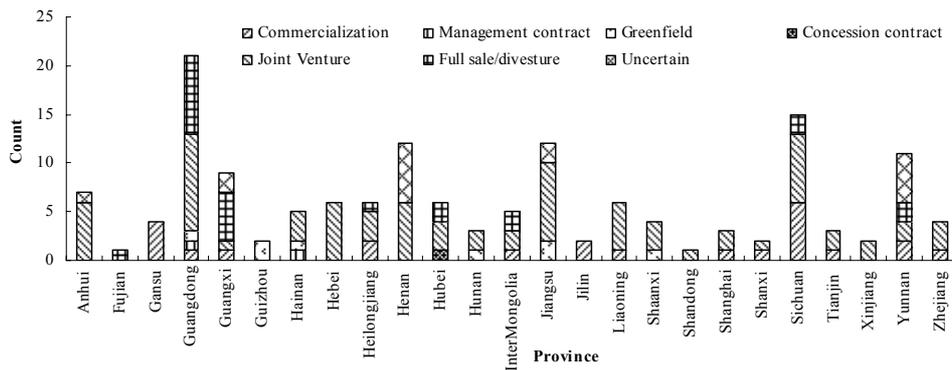


(b) Wastewater projects

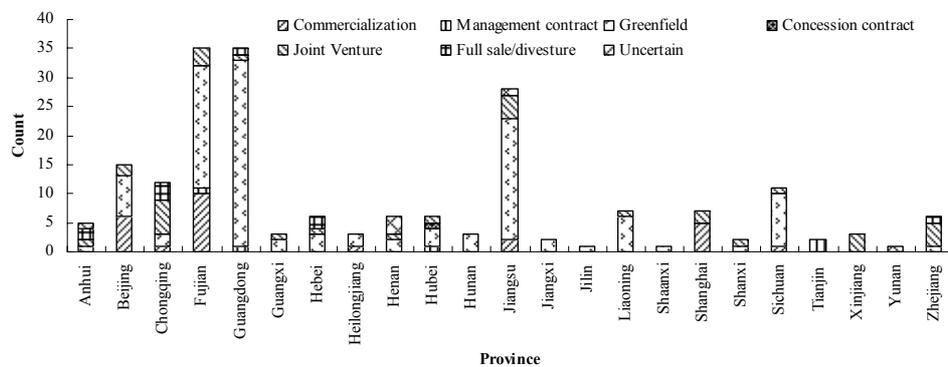
Source: MOC survey, 2005

Notes: 'Uncertain' refers to projects with private sector participation, but with unknown form.

Figure 4.2 Distribution of Private Sector Participation in Water Projects by Capacities



(a) Water supply projects (*)



(b) Wastewater projects (**)

Source: MOC survey, 2005

Notes: (*) No data available for Beijing, Chongqing, Tibet and Ningxia; (**) No data available for Guizhou, Hainan, Tibet and Ningxia

Uncertain: Projects with private sector participation, but with unknown form.

Figure 4.3 Distribution of Private Sector Participation in Water Projects by Provinces

4.5 Three Case Studies of Public-Private Partnerships

The reported growing involvement of the private sector has led to radical changes in China's water management institutions. In this section, we report on fieldwork on three case studies with distinct modes of private sector involvement (a joint venture, a concession, and a Greenfield contract) to analyze in detail the new institutions and relationships between actors in these constructions. During fieldwork in Maanshan and Shanghai, we carried out face-to-face semi-structured interviews with relevant local officials (from the construction authority, price authority, planning and reform authority, state-owned assets administration authority, and environmental protection bureau) and managers of water service providers (water treatment plants/companies, wastewater treatment plants/companies). In the performance assessment project of Macau Water Company Ltd., the managers of relevant departments as well as the representative of Macau Government were interviewed. In total around 30 interviews were held. While these three cases represent different forms of private sector involvement, they cannot be hold representative. All three cases have been assessed positively by the Chinese government and independent researchers (see Fu and others, 2006), making them rather best practices than representative cases. But together they illustrate the institutional transformations that come along private sector involvement.

Joint Venture: Maanshan Water Supply

Maanshan City is an industrial, prefecture-level city of 1,686 square kilometers, and a population of 1.24 million (2004), of whom 46.8 per cent lives in urban areas. According to the 2004 MOC statistics, 88.7 per cent of the urban population has access to water supply. Water resources are abundant in Maanshan City due to its advantageous location on the south bank of the Yangtze River and abundant annual rainfall (1062-1092mm). Maanshan Construction Commission (MASCC) is not only the competent authority for water supply and wastewater treatment and as such plays a leading role in the water sector reform. It is also, as a so-called 'Big Construction Commission', the main governmental agency responsible for urban planning, construction and management (cf Wu, 2003).

In 2002, following the call of Central Government and Anhui Provincial Government, MASCC embarked upon marketization reform in water and other public utilities (e.g. gas, public transport), widely inviting business actors to become active and invest. The director of MASCC, Mr. Xu argued that changing the current water institutions and increasing service quality were the most important reasons and objectives for embarking on marketization in the water sector in Maanshan, rather than bringing in non-governmental capital (personal interview, 2004). Marketization was expected to impel and accelerate the reform of converting the old Maanshan Water Supply Company (MASWSC, established in 1958 as state-owned and state-subsidized company with a total assets of 4.37million RMB in 2002, ca. 0.528 million US\$ at the exchange rate of 1US\$ = 8.277RMB) into a new institutional lay-out. After negotiating with several private companies, MASCC first started – as a kind of trial - a joint venture with Beijing Capital Group (BCG) for one water supply plant (WTP, BCG owning 60% of shares). This joint WTP sold purified water to MASWSC and performed significantly better than other WTPs managed by MASWSC alone. In 2004 MASCC expanded the joint venture cooperation with BCG to all WTPs of Maanshan City, in which BCG obtained a 60% share by bringing in 90 million RMB (ca. 10.875 million US\$ at the exchange rate of 1US\$ = 8.276RMB). The new joint venture company (MAS-BCWLC) was awarded a 30-year concession right. Both BCG (private sector) and MASWSC (public sector) bear responsibility of investment, operation and maintenance of the WTPs (excluding the pipe networks) and service obligations (see Figure 4.4). With respect to the pipe networks, MAS-BCWLC manages and maintains the existing (pre-2004) network by signing a lease contract with MASWSC, which remained owner of the assets and bears the financial obligations (debts). In the meanwhile, MAS-BCWLC is requested to invest in new pipe infrastructure in new development areas and in non-piped neighborhoods.

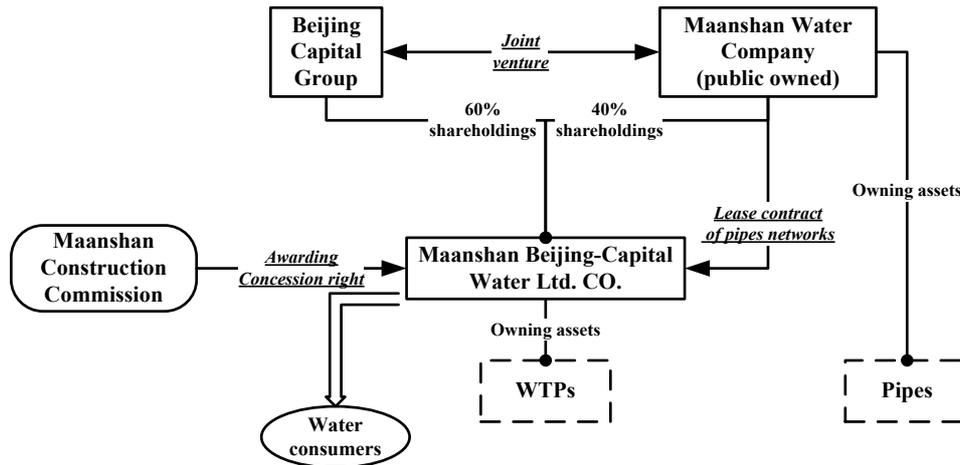


Figure 4.4 Organizational Structure of Maanshan Water Supply System

Within the new joint venture structure, the board of MAS-BCWLC (4 members from BCG and 3 from WASWSC) is the current decision-maker regarding planning (within the objectives set by the municipal master planning), investment and financing, partly replacing the traditional of government decision structures. According to the contract, the general manager of the joint venture company comes alternately from MASWSC and BCG. Taking into account the social dimensions of water provisioning, the government claimed three key conditions in the agreement with the concessionaire: first, the concessionaire (MAS-BCWLC) must ensure sufficient and safe water provision and the government can take over all facilities without any indemnity if the concessionaire fails; second, the concessionaire cannot change the public and social nature of water and should include relevant social responsibilities as governmental requirements (e.g. employing all personnel from the old water company, providing free water for fire fighting, reducing/subsidizing water bills of the poor); third, the government controls the water price.

In order to ensure high-quality water and service, MASCC regulates the performance of MAS-BCWLC via assessing annually the specified objectives approved by both the MAS-BCWLC board and MASCC. For instance, MAS-BCWLC was requested to achieve 12 key objectives in 2004: 1) investment of 18 million RMB (ca. 2.175 million US\$ at the

exchange rate of 1US\$ = 8.276RMB); 2) selling 48 million cubic meter water or more and reclaiming >90% of water bills; 3) fulfilling indicators of water service quality (for instance, >99% of the control points should reach the required water quality standards; >98% control points should reach standards for water pressure; a maximum of 30% water loss; burst pipes repairs within maximum time limits); 4) fulfilling all MASCC indicators for safe work; 5) construction of the main body of the No.4 WTP and 25 kilometer new pipes; 6) fulfilling client service indicators (for instance, 100% good client service; >90% public satisfaction); 7) fulfilling the reconstruction of Xiangshan Town water supply system; 8) elaboration and submitting a water supply plan; 9) achieving the relevant objectives of National Civilized City Assessment System (which was proposed by Central Cultural and Ideological Building Commission in 2004; it includes 119 indicators); 10) submitting water supply plans to Municipal People's Congress and Municipal People's Political Consultative Conference; 11) responding adequately to complaints and reporting this information to the government; and 12) take anti-corruption measures.

After establishing the joint venture in 2002, the total length of pipes and the volume of water provision have increased (see Figure 4.5) and MAS-BCWLC has been in compliance with all requirements of the government, according to interviews with local officials. From 2004 till 2005, MAS-BCWLC has invested about 90 million RMB (ca. 10.875 million US\$ at the exchange rate of 1US\$ = 8.276RMB) for building new infrastructure, updating old facilities and aged pipes, and establishing a customer service system. In the meanwhile, the government has stopped subsidizing WTPs after the involvement of BCG and the joint venture even turned over about 18.7 million RMB (ca. 2.260 million US\$ at the exchange rate of 1US\$ = 8.276RMB; including 2 million RMB of the rent fee for pipe networks, 4.7 million RMB of dividends, 7.7 million RMB of corporate income tax, 3 million RMB of value added tax, and 1.3 million RMB of the expense of other taxation; the total taxation of 12 million RMB is about 25% of the total turnover of MAS-BCWLC in 2004) to the local government in 2004. The improved service quality of water provision not only satisfied the consumers, but also resulted in government (and the price public hearing; cf. Zhong and Mol, 2007) support for the first tariff reform after private sector involvement in 2004. Maanshan Government increased the water tariff from 0.83 to 1.08 RMB/m³ (ca. 0.10 to 0.13 US\$/m³ at the exchange rate of 1US\$ = 8.276RMB; rate for household consumers) and indirectly subsidized MAS-BCWLC by moving the additional tax of water provision (e.g. 0.05 RMB/m³ for household consumers)

to the income of the joint venture water company. In 2004, the per capita annual income of urban households of Maanshan was 10,189 RMB (ca. 1231.15 US\$ at the exchange rate of 1US\$ = 8.276RMB), of which around 1.16% was spend on water services (calculated based on daily household water use of 300 liter per capita).

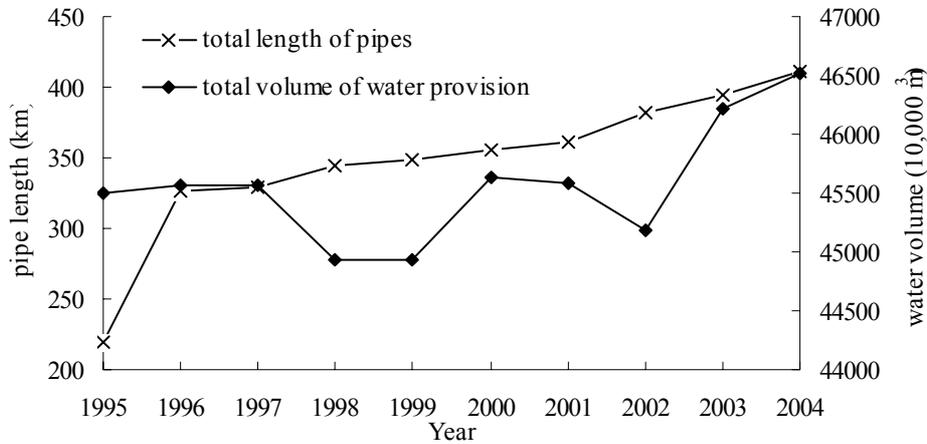


Figure 4.5 Total Length of Pipes and Annual Water Provision in Maanshan, 1995-2004

Obviously, the involvement of BCG has brought in additional capital to develop Maanshan's water supply sector. But more importantly it has changed the institutional structure, improved the water service quality and quantity, as well as reduced the governmental input in this field (see Figure 4.6). In this structure, the government benefits both from the taxations and dividends of the joint venture company, while transferring part of the financial, building and operational risks to the private sector. Following this model of Maanshan City, BCG has successfully expanded its activities to other cities, such as Huainan (Anhui Province), Baoji (Shanxi Province), and Yuyao (Zhejiang Province).

However, this private sector involvement practice of Maanshan is argued to have a (potential) political risk due to the lack of a sound legal basis. In particular, in transitional China policies are perceived to be instable and insufficiently law-based. Up till now, details on measures and rules to regulate private utility companies are still missing in current national and Anhui provincial policy papers (Maanshan has no legislation right). This is a

common problem in Chinese marketization practices in the water sector, as argued by many lawyers and academics. For instance, Shenyang water supply has experienced several failed marketization practices due to the constantly changing policies and decisions of the local government during 1995-2000 (field survey, 2004).

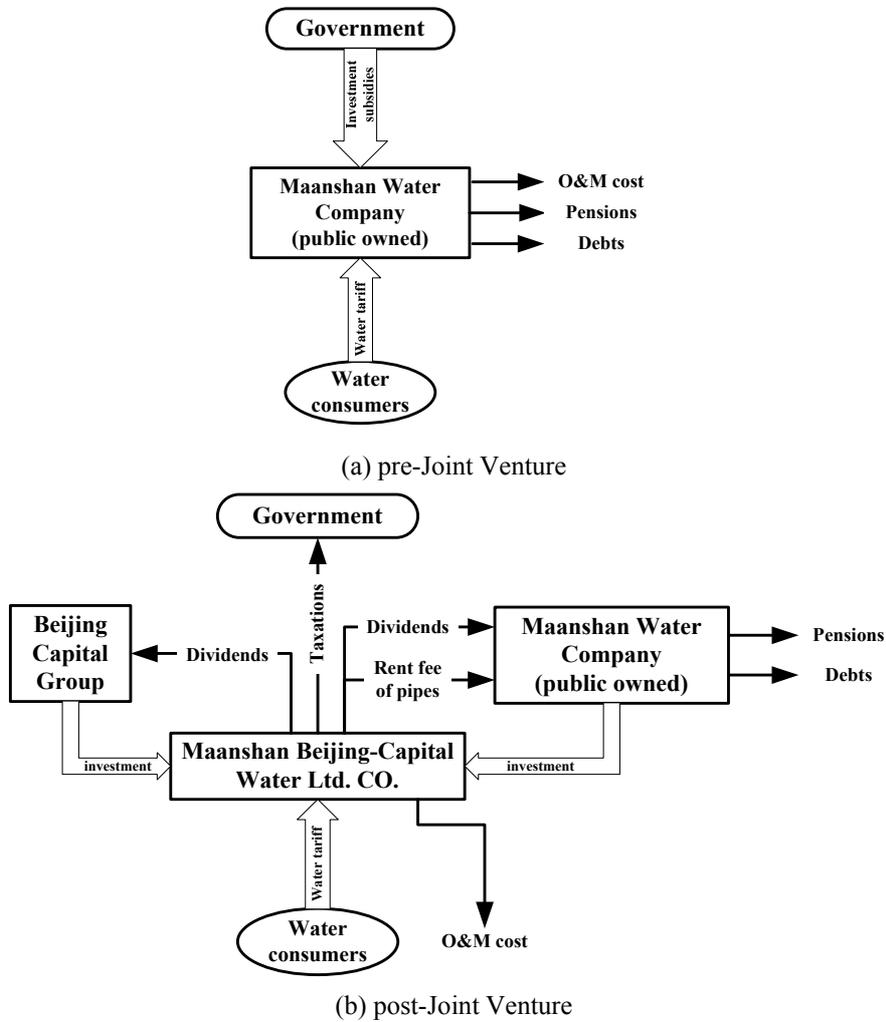


Figure 4.6 Monetary Flow within Maanshan Water Supply

Concession contract: Macao Water Supply

Macau is one of the two Special Administrative Regions of China, together with Hong Kong. Administrated by Portugal until 1999, it was the oldest European colony in China, dating back to the 16th century. As a small territory of 28 km² on the southern coast of China, consisting of a peninsula and the islands of Taipa and Coloane, it has a population of 508,000 (2006).

Macau has a long history in the private provision of drinking water, since the earliest Macau Water Company Ltd. (MWC) was founded in 1932 as a full private capital company invested by individuals. Three years later, MWC was taken over by a British Electricity Lighting Company for 10 years and since 1946 by the president of the Macau Economic Department and other individual shareholders. Due to lack of capital and advanced technologies, Macau had an inadequate water supply service with poor water quality and discontinuous water provision during the 1970s. In 1985, Macau Government, learning from the concession management practices in the French water sector, awarded a consortium of two private companies, NWS Holding Limits (Hong Kong) and SUEZ Environment (France), a 25-year concession contract. Macau Government remained owner of the existing, pre-1985, assets (plants and pipe networks), while the private Macau Water Supply Ltd. (MWSL, the former MWC) bears responsibilities for operations and maintenance of these assets, as well as for new investments and service obligations (see Figure 4.7). This concession contract is not only the first private sector participation construction in Chinese water sector, but also the first contract that seems to end with a positive result.

Distinct from the previous private owners, who had little experience in the field of water provision, SUEZ (France) brought in advanced water knowledge and technology. According to the concession contract, MWSL must provide high-quality water supply service, as well as bear several obligations such as planning, investment, construction, operation and maintenance of the infrastructure under the supervision of Macao Government. In practice, Macau Government has delegated tasks, responsibilities and obligations to a very large degree to MWSL.

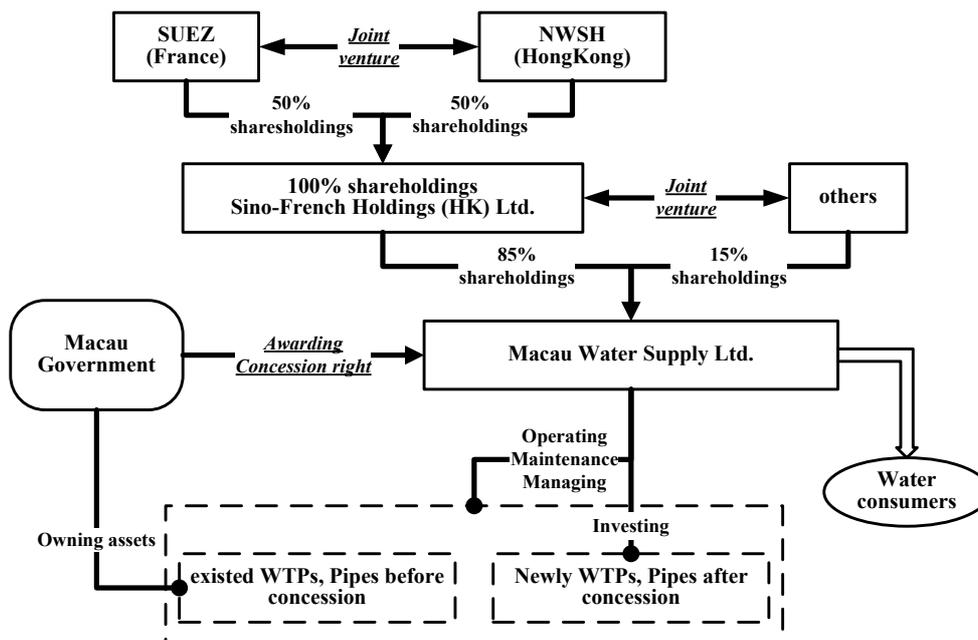


Figure 4.7 Organizational Structure in Macao Water Supply

Coming to the end of the 25-year concession contract, MWSL has fulfilled almost all terms of the initial contract. It has, among others, considerably improved water service quality by increasing service access and provision, decreased the loss of water leakage (see Figure 4.8), and kept water tariff (corrected for inflation) at a stable level (see Figure 4.9).

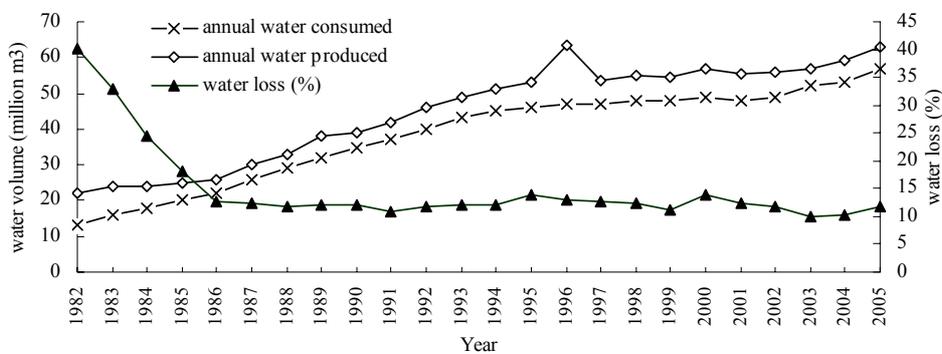


Figure 4.8 Annual Water Demand-Provision and Water Loss of Macao, 1982-2005

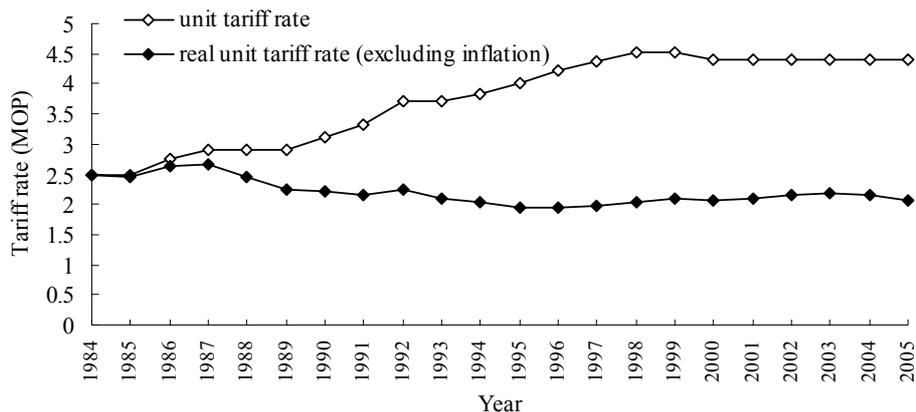


Figure 4.9 Water Tariff Rates of Macao, 1982-2005

In the concession contract, the government did not specify conditions and safeguards for the poor. But in practice, MWSL not only reduced the water bill for low-income, disabled and other vulnerable groups. For instance, MWSL has launched the “Elderly-In-Needs” water subsidy program in 2001, which offers those aged over 55 free water consumption of 5 cubic meters per month. Since May 2005 the “Water for All” program offers free water consumption to other categories of people in needs, such as single-parent families and disabled. But also in addition, it built two potable “Wallace fountains” (a special public fountain with potable water) in Macau, providing free potable water to tourists and citizens. MWSL has also been active in various social welfare and charity activities, providing total donations of 2.08 million MOP (1MOP = 0.965RMB, 2007; ca. 0.26 million US\$ at the exchange rate of 1US\$ = 8.276RMB) during 2002-2005. During 1985-2005, MSWL also charged discounted water tariffs for governmental agencies, and handed in over 260 million MOP (1MOP = 0.965RMB, 2007; ca. 32.56 million US\$ at the exchange rate of 1US\$ = 8.276RMB) of taxes and about 56 million MOP (1MOP = 0.965RMB, 2007; ca. 7.012 million US\$ at the exchange rate of 1US\$ = 8.276RMB) of concession fees to the government.

In both Maanshan and Macau, the water tariff is the main financial source for water companies, while governmental subsidies have been abandoned. Accordingly, whether the water tariff can cover the costs is significant. In the case of Macau, the Macau Government

owns the pre-concession infrastructure assets, which demands a smaller first investment from the Consortium. The water tariff could easily cover the cost of operation and maintenance (and not the huge capital costs of existing assets). Unlike the joint venture construction in the Maanshan case, Macau Government leaves all financial responsibilities to the private sector after the concession, and benefits from taxes, concession fees and discounts on government water bills (see Figure 4.10). Due to the limited initial investments of the private consortium, sharp water tariff increases were avoided after privatization (often one of the major reasons for public resistance and failed private sector participation in other countries). The local government still owns part of the infrastructure assets, in particular the pipes system, with huge sunk-costs.

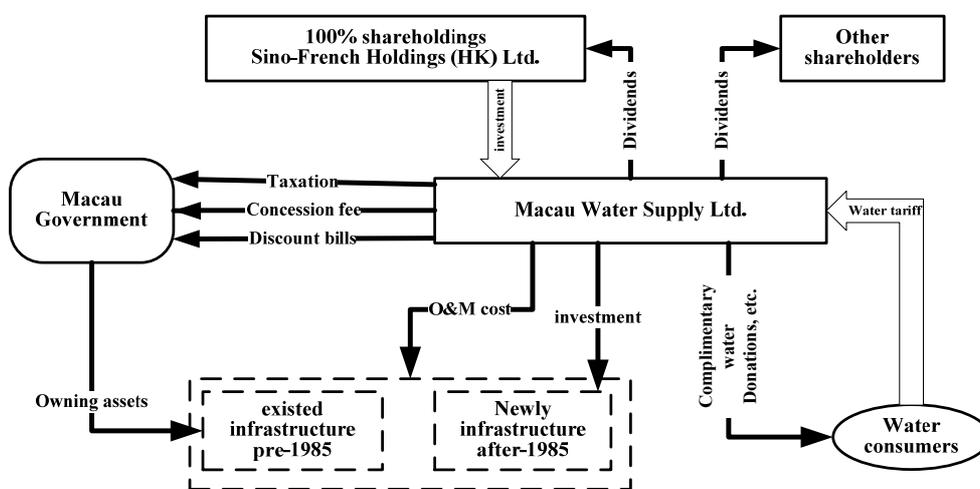


Figure 4.10 Monetary Flow within Macao Water Supply

Macau is also an interesting case because of the unique regulatory system, which includes the water quality regulator (IACM), and a unique Government Delegate. IACM is in charge of the water quality regulation, and monitors and controls drinking water quality by random sampling and analysis of over 70 water samples around Macau everyday. The Government Delegate is not a government official, but an individual working in another public utility company and appointed by the government. Following Macau laws Mr. Lin

Runzhong, the Government Delegate for water supply, is appointed for a period of five years by the Macau Government, and is not only the regulator of MWSL, but also an important linkage between MWSL and the government. He participates at all MWSL board meetings and reports relevant information and documents to the government. The Government Delegate decides which information is considered relevant. He is also in charge of assessing the performance of MWSL, and comments on the five-year plans and tariff plans before MWSL sends these to the government for approval. The Macau government generally follows the comments and assessments of the Government Delegate. In this sense, the non-governmental Government Delegate is defined a specified role and powerful position in governing the water sector. This institutional arrangement relates to the small size of Macau Government, where only a limited state capacity (in quantitative and qualitative terms) is available for numerous public tasks. In conclusion, it can be argued that after 1985 the Macau government has played a meager role in the drinking water management.

Greenfield contract: Shanghai wastewater

The Greenfield contract (e.g. BOT, TOT) is the dominant form of private sector participation in wastewater sector reform throughout the country. Shanghai Zhuyuan No.1 WWTP project is one of the most famous Greenfield projects in China. It is the one of the largest WWTP in China till today, with a treatment capacity of 1.7 million m³ per day and an advanced primary treatment, serving an area of 107 km² and about 23.5 million inhabitants. But it also has become famous for the lowest service price: 0.22 RMB (ca. 0.0266US\$ at the exchange rate of 1US\$ = 8.276RMB) per cubic meter treated wastewater.

In 2002, the Youlian Consortium (consisting of Youlian Development Company with 45% shares, Huajin Information Investment Ltd. Company with 40% shares, and Shanghai Urban Construction Group with 15% shares) won the open tender for Zhuyuan No.1 WWTP project by bidding the lowest treatment costs. A Project Company – Shanghai Zhuyuan Youlian No.1 Wastewater Treatment Ltd. CO. – was established and awarded a 20-year concession agreement by Shanghai Water Authority. A service management contract was signed with Shanghai Sewerage Company (a fully state-owned company administrated by the government) including details of rights and obligations. Two years

later, Youlian Development Company withdrew from this project by transferring the shares and obligations to InterChina Holdings Group (see Figure 4.11).



Figure 4.11 Private Sector Involvement in Shanghai Wastewater Treatment

According to the agreement between Shanghai Water Authority and the private company, Shanghai Water Authority should minimize its interventions in the construction, operation and maintenance of WWTP and limit them to safeguarding public health and safety. All conditions and objectives with regard to water service quality are defined in the service contract between Shanghai Sewerage Company and the private company. Among others, the private company has to install an on-line monitoring system and is requested to invite an authorized third party for regular monitoring (on indicators such as BOD₅, COD_{cr}, SS, NH₄-N, and phosphate). This should be paid by the private company, while reporting to the Shanghai Sewerage Company should take place within in 5 days. Shanghai Sewerage Company may conduct random water examination at any time. According to the local officials, Shanghai Zhuyuan WWTP has fulfilled all responsibilities and obligations required by the contract up till now, including meeting the water quality standards.

In the case of Shanghai Zhuyuan Greenfield project, the government has transferred its traditional responsibilities of investment, construction, operation and maintenance (for the contract period) to the private Project Company, accompanied by paying a service fee (see Figure 4.12). Different from the joint venture construction in Maanshan and the concession construction in Macau, in which corporate profits directly depend on the water tariff, the private operator within a Greenfield contract is paid a service price negotiated between the government and the private sector. This service price depends on the

investments and agreed performance levels, rather than on the user fee level, and which provides the private sector with the financial risks. Accordingly, the low service price of Zhuyuan No.1 WWTP (which was 42% less than the projected costs by government) presented in the public bidding, was argued to have a close relation to earlier governmental input in this project. Shanghai Water Assets Management Development CO. Ltd., a fully public-owned company, was in charge of the pre-phase design and invested about 30 million US dollar in the fixed infrastructure of this project, while the government provided the land free of charge to the operator. Strictly speaking, Shanghai Zhuyuan No.1 WWTP Greenfield project is a quasi-BOT project, due to the fact that part of the investment comes from the government.

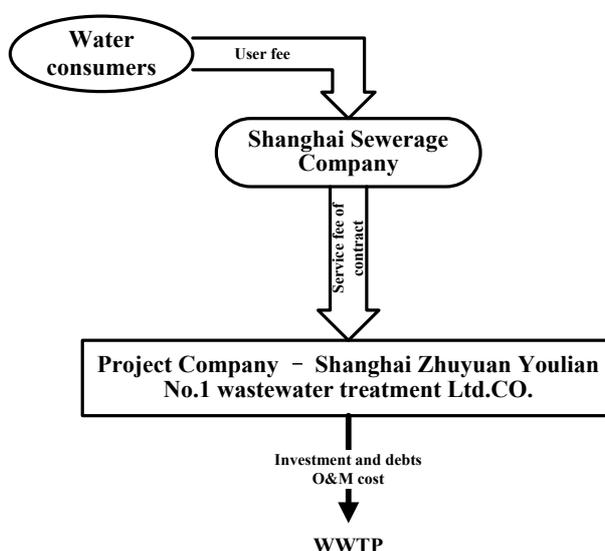


Figure 4.12 Monetary Flow within Shanghai Zhuyuan Greenfield Project

The experience of Shanghai is an example of full governmental delegation of the daily management of WWTP to the private sector, while financial support via subsidies and preferential policies (e.g. land use) facilitate privatization with low service prices. It is, however, too early to fully assess the success of this project. Some BOT WWTP projects in

other cities have met problems following gaps in the current national policy documents. For instance, projects in Foshan (Guangdong Province) couldn't run properly due to conflicts over current land use right. And projects in Beijing were delayed during the financing process because the domestic private actors met difficulties in obtaining loans from domestic banks due to the lack of a sound loan policy. The commercial banks couldn't provide long-term loans as required for BOT-types projects as their credit policies are restricted for the private sector (Zhong and Fu, 2005), while the China Development Bank can provide long-term loans for BOT-types projects only for a limited number of clients (Chang and others, 2006).

4.6 Conclusions

With the emergence and blossoming of various forms of private sector involvement in the Chinese water sector, the traditional structure of full governmental provision of water supply and wastewater treatment has changed dramatically. The analysis in this paper has provided evidence of the contribution of these new modes to increased capital investment, and especially of more efficient operations and improved service provision. In that sense, the original goals of the Chinese government to embark upon private sector involvement in water provisioning and treatment have been met. However, the early stage most contracts are in, and the not yet crystallized forms and modes of privatization, prevents us from drawing any final conclusions on the impact of private sector involvement in the Chinese water sector.

From the three case-study projects with private sector participation, we can draw some lessons for how to successfully involve the private sector into the provision of water services. Firstly, a balance between the water tariff level, profits of investor and governmental subsidies is required. As Hall and Lobina (2005) state, most practices of water privatization fail due to public resistance following sharp price increases and job losses. In China, this has not (yet) been the case, due to large increases in efficiencies and governmental support to fixed infrastructure assets, reducing financial risk of the private sector and limiting the need for large water tariff increases. At the same time, the significant economic growth levels enables local residents to cope with some tariff increases, the poor and disadvantaged have been subsidized by the government, job losses

have been minimized following social policies, and public hearings have contributed to higher levels of legitimacy. This all contributed strongly to a relatively smooth transformation of China's water sector.

Secondly, the selection of the PPP form has a close relation with the level of local water tariff. As illustrated by this paper, Greenfield projects appear to be applied when tariffs are not sufficient, especially in the wastewater sector (see also Zhong and others, 2006). While Joint Venture approaches are often used in cities with sufficiently high water tariff, in particular in the water supply sector.

Thirdly, it is crucial to accelerate the establishment of systematic and comprehensive governmental regulatory framework, as the current ad-hoc, fragmented and diverse regulatory system endangers efficiency in water service development and certainty and stability for foreign investors. Experiences in many countries have witnessed that regulation is a key aspect in successful privatization in the water sector and a competitive benchmarking system is regarded as useful in an effective regulatory approach. In the late 2006, the MOC attempted to develop a Chinese water supply benchmarking system, which is still ongoing. However, the current private sector involvements in the Chinese water sector still face many legal and regulatory uncertainties. Too often local authorities experiment with systems of governmental regulation and control, or – as in Macau – seem to become marginalized. According to interviews with local officials during our fieldwork, the importance of establishing a workable regulatory and legal system is essential in that. Guaranteeing sufficient and safe water service to the public is jeopardized by the fact that governments can no longer fully control the planning, operation and management of water services as before private sector participation. This might be just signs of uneasiness with the new water institutions and division of tasks and responsibilities, but can also be the heralds of an emerging debate on privatization in the Chinese water sector.

Finally, but not least, it is important to identify the differences in risk allocations in the water (service) market between the public and private sectors within different modes of PPP. As Table 1 and the three case-study projects illuminate, with the various forms of privatization, the government often transfers (smaller or larger parts of) financial risks, building risks, and operation and maintenance risks to the private sector. Meanwhile, in the end the government can always take over all facilities without paying an indemnity to the private sector if a concessionaire fails in obtaining the goals as formulated by governmental

authorities, or some conflicts emerge in the further policies (e.g. the terminated contracts that are regarded as providing the private sector a fixed investment return). In that sense, the still unstable legal base in transitional China provides a major political and transfer risk for private investors.

Acknowledgement

The authors acknowledge the support from the Ministry of Construction, the World Bank, and numerous local officials and water companies interviewed during field work, 2004-2005.

Literature

- Afonso A., L. Schuknecht, and V. Tanzi, 2005. Public sector efficiency: An international comparison. *Public Choice*, 123: p.321-347.
- Anwandter L., and T. Jr.Ozuna, 2002. Can public sector reforms improve the efficiency of public water utilities? *Environment and Development Economics*, 7: p.687-700.
- Beck, U., 1986. *Risikogesellschaft. Auf dem Weg in eine andere Moderne*, Frankfurt: Suhrkamp
- Birchall J., 2002. Mutual, non-profit or public interest company? An evaluation of options for the ownership and control of water utilities. *Annals of Public and Cooperative Economics*, 73:2, p.181-213.
- Chang, M., T. FU, and L.J. Zhong. 2006. Policy-based finance and urban water sector reform, *China Water & Wastewater*, vol.22, No.10, pp.77-80, (in Chinese).
- Davies, A.R., 2002. Power, politics and networks: shaping partnerships for sustainable communities, *Area* vol. 34, no. 2, pp.190-203
- Fu, T., and L.J. Zhong, 2005. Commentary: the MOC *Opinions on Strengthening Regulation of Public Utilities*, October 25 of 2005, at: www.h2o-china.com, (in Chinese).
- Fu, T., L.J. Zhong, and M. Chang, 2005. Case studies and recommendation of concession management in water sector, in Fu T., J.N. Chen, L.J. Zhong, *et al, Twelve Key Issues of Urban Water Sector Reform*, China Architecture & Building Press: Beijing (in Chinese).
- Fu, T., M. Chang, and L.J. Zhong, 2006. *Chinese Urban Water Sector Reform: Empirical Experiences and Case Studies*, China Architecture & Building Press, Beijing (in Chinese).

- Hall, D., and E. Lobina, 2005. The relative efficiency of public and private sector water, Report commissioned by Public Services International (PSI), at: www.world-psi.org, September 2005.
- Hall, D., E. Lobina, and R. de la Motte, 2005. Public resistance to privatization in water and energy, *Development in Practice*, vol. 15, No.3&4, June 2005.
- Hancock, T., 1998. Caveat partner: reflections on partnership with the private sector, *Health Promotion International* vol. 13, no. 3, pp.193-195
- Hart, O. 2003. Incomplete contracts and public ownership: Remarks, and an application to public-private partnerships. *The Economic Journal*, 113 (March): p.C69-C76.
- Izaguine, A.K., and C. Hunt, 2005. Private Water Projects, in *Note of Public Policy for the Private Sector* by the World Bank Group, No.297, July 2005.
- Huber, J., 1985. *nbogengesellschaft: Ökologie und Sozialpolitik*, Frankfurt: Fisher Verlag
- Jänicke, M., 1986. *Staatsversagen. Die Ohnmacht der Politik in die Industriegesellschaft*, München: Piper
- Kikeri, S., and A. Kolo, 2006. Privatization Trends, in *Note of Public Policy for the Private Sector* by the World Bank Group, No.303, February 2006.
- Linder, S.H., 1999. Coming to Terms With the Public-Private Partnership. A Grammar of Multiple Meanings, *The American Behavioural Scientist* vol. 43, no. 1, pp.35-51
- MirafTAB, F., 2004. Public-Private Partnerships. The Trojan Horse of Neoliberal Development? *Journal of Planning Education and Research* vol. 24, pp. 89-101
- Mol, A.P.J. 2007. Bringing the environmental state back in: partnerships in perspective, in P. Gasbergen, F. Biermann and A.P.J. Mol (Eds), *Partnerships, governance and sustainable development*, Cheltenham: Edward Elgar.
- Mol, A.P.J., 2002. Political Modernisation and Environmental Governance: between Delinking and Linking, *Europaea. Journal of the Europeanists*, vol. 8, no. 1-2, pp.169-186
- Nickson, A., 1996. *Urban Water Supply: Sector Review*, University of Birmingham: School of Public Policy, Paper in the role of Government in Adjusting Economies, No.7, January.
- Nickson, A., 1998. *Organizational structure and performance in urban water supply: the case of the SAGUAPAC cooperative in Santa Cruz, Bolivia* Paper presented at 3rd CLAD Inter-American Conference, Madrid, 14-17 October.
- Nickson, A., and C. Vargas, 2002. The limitations of water regulation: The failure of the Cochabamba Concession in Bolivia, *Bulletin of Latin American Research*, vol.21, No.1, pp.99-120.
- OECD, 2003. Public sector modernization, *Policy Brief*, October 2003.
- OECD, 2004a. Public sector modernization: Modernizing public employment, *Policy Brief*, July 2004.

- OECD, 2004b. Public sector modernization: Changing organizational structures, *Policy Brief*, September 2004.
- OECD, 2004c. Public sector modernization: Governing for performance, *Policy Brief*, October 2004.
- OECD, 2005a. Public sector modernization: Open government, *Policy Brief*, February 2005.
- OECD, 2005b. Public sector modernization: Modernizing accountability and control, *Policy Brief*, April 2005.
- Oppenheim, J., and T. MacGregor, 2004. *Democracy and public-private partnerships*, International Labour Office
- Poncelet, E.C., 2001. A Kiss here and A kiss There: Conflict and Collaboration in Environmental Partnership, *Environmental Management* 27, 1, pp13-25.
- Pongsiri, N., 2002. Regulation and public-private partnership, *The International Journal of Public Sector Management*, vol.15, No.6, pp.487-495.
- Prasad, N., 2006. Privatization results: Private sector participation in water services after 15 years, *Development Policy Review*, 2006, 24(6):669-692.
- Robison, R., and K. Hewison, 2005. Introduction: East Asia and the Trials of Neo-Liberalism, *Journal of Development Studies*, 41 (2):183-96.
- Seppälä, O., J. Hukka, and T. S.Katko, 2001. Public-private partnerships in water and sewerage services – Privatization for profit or improvement of service and performance? *Public Works Management & Policy*, vol.6, No.1, pp.42-58.
- Spiller, P.T., and W. Savedoff, 1997. Commitment and governance in infrastructure sectors, in Willig, Uribe and Basañes (eds.) *Can Privatization Deliver Infrastructure for Latin America?*, Balitmore, Maryland: Johns Hopkins University Press.
- Van Tatenhove, J., B. Arts, and P. Leroy, eds., 2000. *Political Modernisation and the Environment. The Renewal of Policy Arrangements*. Dordrecht: Kluwer
- Tong, X.C., 2005. Problems of local legislation for concession management, October 8 of 2005, at: www.h2o-china.com, (in Chinese).
- US National Research Council, 2002. *Privatization of Water Services in the United States*, National Academy Press: Washington DC, 2002.
- Vining, A., and A. Boardman, 1992. Ownership vs. Competition: Efficiency in public enterprise, *Public Choice*, 123: p.205-239.
- World Bank, 2004. *Public and Private Sector Roles in Water Supply and Sanitation Services*, the World Bank: Washington DC, April 2004.

Wu, X.Y., 2002. Models of urban management institutions and the development trends (in Chinese), *Urban Management*, vol.6.

Zhang, L., 2006. Water regulation needed to improve, November 17 of 2006, at: www.h2o-china.com (in Chinese).

Zhong, L.J., and T. Fu, 2005. BOT applied in Chinese wastewater sector, paper presented on ADB workshop on *Sanitation and Wastewater Management: The Way Forward*, Malina, 19-20 September 2005.

Zhong, L.J., X.X. Wang, and J.N. Chen, 2006. Private participation in China's wastewater service under the constraint of charge rate reform, *Water Science and Technology: Water Supply*, vol. 6, No.5, pp 77-83.

Zhong, L.J., and A.P.J. Mol, 2007. Emerging environmental democracy in China: Public hearings on water tariff setting, *Journal of Environmental Management*, forthcoming, doi:10.1016/j.jenvman.2007.04.018..

Chapter 5 Private Participation in China's Wastewater Service under the Constraint of Charge Rate Reform³⁹

Abstract

China is moving towards a market-based economic system, which includes the water sector. The state is emphasizing tariff reform of the water sector, which is a necessary step in the transition to a market economy, and also an important step for China's wastewater management. With the gradual increase of wastewater service charges, more private investment is attracted to participate, which leads to a decrease in the proportion of direct public investment. This paper develops a model to quantitatively analyse the dependence of private investment on the scale of public investment at different rate levels of wastewater treatment charge. In the meantime, the impacts caused by tax policies on rate level and private sector participation are analysed. In terms of the survey regarding the marketization reform process of the wastewater sector, a summary of the current major public-private-partnership (PPP) approaches in China is given in this paper, which reveals that the strategy option also depends on the rate level of wastewater treatment charge. As a consequence, the government has to keep a greater investment ratio to initiate the market and induct private investment, particularly because the current WWTC rate is at a low level. Furthermore, the BOT-type option is, and still could be, a major form of PPP in China for a while due to the constraint of the current low rate level of the wastewater treatment charge.

Keywords

Charge rate; charge reform; public investment; public-private partnership (PPP).

³⁹ This chapter contains an article published as Zhong, L., X.X. Wang, and J.N. Chen. 2006. Private participation in China's wastewater service under the constraint of charge rate reform. *Water Science & Technology: Water Supply*, Vol.6, No.5, pp.77-83.

5.1 Introduction

Over the past two decades, China has been moving towards a market-based economic system. In recent years, the so-called “marketization reform” has been widely implemented widely in the water utility sector, which includes organizational change of water service providers, introduction of competition, private sector participation, a new governance structure, etc. (Zhong, 2005). The state is increasingly institutionalized to withdraw from the daily business of water service and create business opportunities for private corporations. During this reform process, the water tariff reform has been of critical importance, mostly due to the huge demand for investment. By the end of 2004, China has built 708 wastewater treatment plants (WWTPs) with a total capacity of $4.9 \times 10^7 \text{m}^3/\text{day}$, and treating about 45.67% of national urban municipal wastewater (excluding townships) (MOC, 2005a). But this treatment capacity is far from adequate to control the increasing water pollution problem in China. It is estimated that the demand for direct investment in urban wastewater infrastructure (including the cost for wastewater treatment, sewers, and sludge treatment) in China is expected to be over 30 billion US dollars between 2006 and 2010.

A tariff is the system of procedures and elements that determines a customer’s total water bill (any part of that bill is called a charge). In China, the water tariff comprises of four parts, i.e., the water resources charge, the charge for water engineering (e.g., the construction of water reservoirs), the water supply price, and the wastewater treatment charge (WWTC) (General Office of the State Council, 2004). In China before the 1980s; however water and wastewater services traditionally had been provided as a public utility almost free of charge. In the late 1990s, a number of cities were requested by the central government to collect WWTCs to raise funds for constructing wastewater treatment facilities. In 2002, the Chinese Government initialized the charge reform with emphasis on increasing charge rates in order to satisfy the needs of constructing a new wastewater infrastructure. Up to now, 475 of total 661 cities have collected the WWTC. However, the current charge system of the wastewater sector is only at its starting point and is far from the reform goals. Water tariff reform includes substantial changes to the water sector, not only in tariff formulation and levels, but also in water regulation, business environment, financial approaches, subsidies and public regulation.

This paper is directed towards discussions of the dependence of private participation on the reform of the wastewater charge system in China. In the next section, we will illustrate first the quantitative impacts of public investments on the possible return to a private cooperation under different wastewater charge rates based upon a developed cost analysis model. The impacts of tax policy and government subsidies on private participation are also discussed. This is followed by a discussion on the types of PPP in China and their reliance on the available financial mechanisms and the charge reform of wastewater sector followed by the conclusion.

5.2 Dependence of Private Participation on Public Investments

The wastewater sector in China is currently not only under rapid development but also is in a transit phase. With the gradual increase of wastewater service charges, more private investments are attracted to participate, which leads to a decrease in the proportion of direct public investment. To achieve the targeted construction level of the wastewater infrastructures, the government needs to keep a good balance between the increase in the wastewater service charge and public investments so that the rate of increase is not too high to be accommodated by residents. In this section, a conceptual model is developed to assess the relationship between public investment, wastewater service charges, and the capacity of private participation, the details of which are now given below.

When a private corporation invests in WWTPs, an investment return is expected, as given below, i.e.,

$$IY_c = I \times (1 - r_g) \times RY_c \quad (1)$$

in which I is the total investment to the newly increased treatment capacity of WWTPs and the rate for treating unit volume of wastewater i is 1486.416 RMB/m³ (MOC, 2001); r_g ($0 \leq r_g \leq 1$) is the public investment ratio; RY_c ($0 < RY_c \leq 1$) is the expected investment return rate and its current value is 8-12% in China. In this study, RY_c is assumed as 10%.

The return to public investment can then be given as,

$$Y = V_n [p_{ww}(1 - r_{t1}) - C] \times (1 - r_{t2}) \times 365 - I \times (1 - r_g) \times RY_c \quad (2)$$

in which V_n is the newly increased daily capacities of WWTP in 10,000m³ per day; p_{ww} is the WWTC rate in RMB/m³; r_{t1} is the sale tax rate at 5.5%; r_{t2} is the income tax rate at 33%; C is either the operational or the full cost of WWTPs and their values are 0.411772RMB/m³ and 0.563888RMB/m³ respectively, in this study (MOC, 2001).

If we assume the governments invests in wastewater service as public goods and have no requirement on investment return ($RY_c = 0$), we can have,

$$p_{ww} = \frac{\frac{i \times (1 - r_g) \times RY_c}{(1 - r_{t2}) \times 365} + C}{1 - r_{t1}} \quad (3)$$

or

$$r_g = 1 - \frac{[p_{ww} \times (1 - r_{t1}) - C] \times (1 - r_{t2}) \times 365}{i \times RY_c} \quad (4)$$

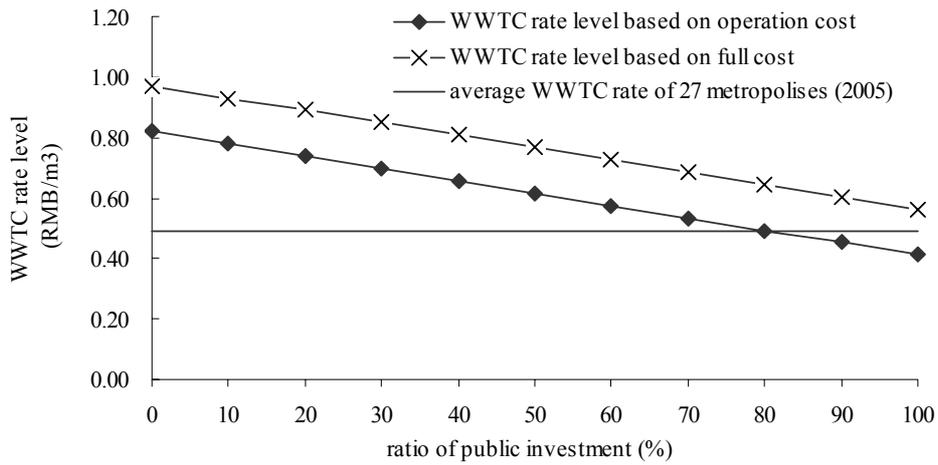
Furthermore, if we assume that the government could implement a tax-free policy to the wastewater sector (i.e., $r_{t1} = 0$; $r_{t2} = 0$), then Equations (3) and (4) can be simplified as,

$$p_{ww} = \frac{i \times (1 - r_g) \times RY_c}{365} + C \quad (5)$$

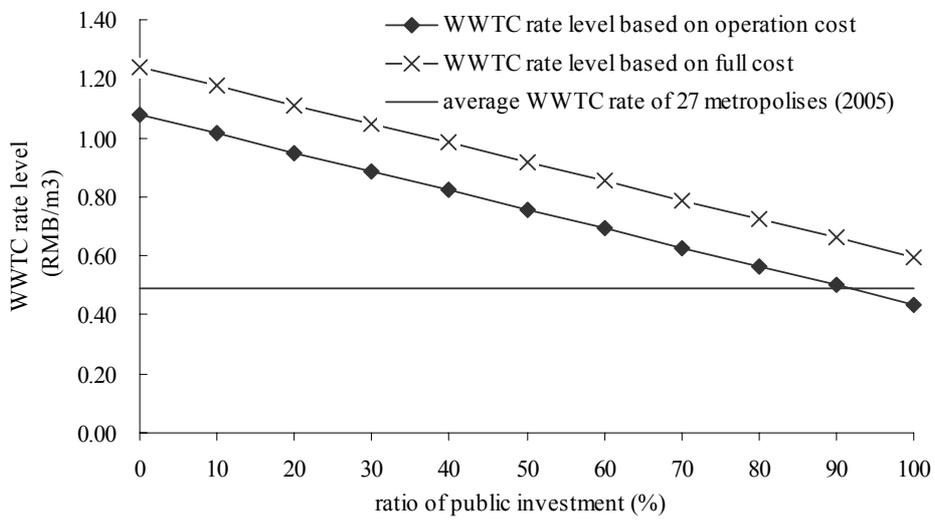
$$r_g = 1 - \frac{(p_{ww} - C) \times 365}{i \times RY_c} \quad (6)$$

Based upon the Equations (3) to (6), the relationships between the WWTC rate and the required proportion of public investments are shown in Figure 5.1. The results reveal that the WWTC rate should be set at 0.819RMB/m³ and 1.079RMB/m³, respectively, in the case of taxes being excluded or included based on the operational cost, and the WWTC rate should be set at 0.971RMB/m³ and 1.240RMB/m³, respectively, in the case of taxes being excluded or included based on the full cost, if public investments were not injected into the wastewater sector. Note that the current average WWTC rate is only 0.490RMB/m³ in China, based on the charge information from 27 metropolises, which are in fact of a comparatively higher WWTC rate than other cities. The current WWTC rate in China requires a very high ratio of public investment (at least 80% in all cases) if wastewater treatment infrastructures are constructed and operated. In other words, the current WWTC rate in China is too low to form a large volume of the wastewater financial market. The incentives to promote private participation thus rely considerably upon financial inputs from the government. Furthermore, we can say that the increase in the WWTC rate has been the bottleneck in reforming the wastewater sector in China.

As the incentives to promote private participation rely considerably upon financial input from the government, Figure 5.2 shows the required ratio of public investment in the capital metropolises of 27 provinces in China under their current WWTC rates, if private investment could be attracted. Again, only in the case of taxes being excluded, two cities (i.e., Beijing and Shanghai) are eligible for full private participation based upon operational costs. In the other cases in terms of both taxes and a full cost recovery, all the cities require certain public investment to start up the water financial market. If a lower WWTC rate is applied, higher public investment is required; and the ratio of public investment exceeds 100% if the WWTC rate is less than the cost. The high ratios of the required public investment across all these metropolises indicate that private participation is widely limited by the wastewater charge rate all over China.



(a) Taxes excluded

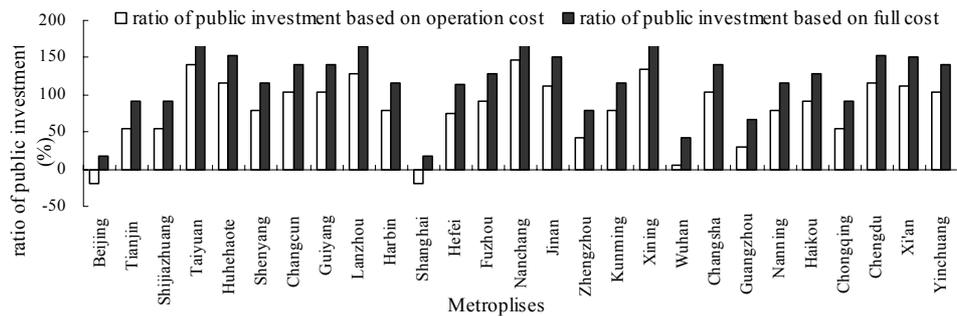


(b) Taxes included

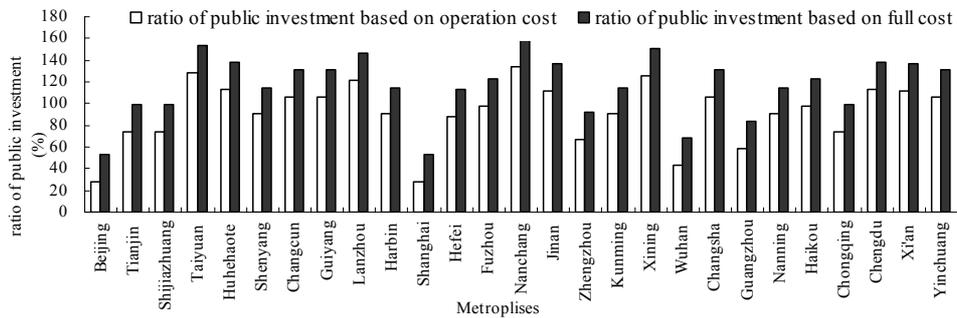
Figure 5.1 The WWTC Rate and the Required Ratio of Public Investment

Furthermore, tax policies are also important for private participation. As shown in Figure 5.1, the projected WWTC rate with taxes is approximately 30% higher than without taxes. This means a higher rate level of WWTC is required while taking taxes into account. If higher taxes are paid by the corporation, a higher rate level is required.

It is a fact that the charge reform process of increasing the rate level of WWTC to meet cost-recovery is fairly slow and complicated, because the rate level is also constrained by the acceptability of public and other non-economic factors. Thus, it is essential to take tax policy reform into consideration while implementing the charge reform of wastewater, which can also stimulate the private sector participation in the wastewater sector.



(a) Taxes excluded



(b) Taxes included

Figure 5.2 Ratio of Public Investment at a Certain WWTC Rate

5.3 Public-Private Partnerships in China

Rapid economic development and urbanisation over the last two decades has led to considerable deterioration of environmental quality in China. The huge demand for the construction of wastewater infrastructures, together with the government's policy of marketizing the wastewater service, has been highly attractive to private participation. As discussed above, however, the progress of private participation has been limited largely, due to the low WWTC rate.

Although PPP in the water sector has been practised in China over a decade, it has been only widely accepted since 2003 when the Central Government formally opened the public utilities to private sector. This progress was further accelerated due to the issues of 'The Administrative Method of Urban Utilities Concession' by the MOC and 'The Decision on the Investment Institution Reform' by the State Council (SC) in 2004. According to the latest survey of the MOC, 184 of 274 investigated facilities at the municipal level have applied PPP. Figure 5.3 summarises the major types of PPP applied in China, among which the build-operate-transfer (BOT) type is dominant.

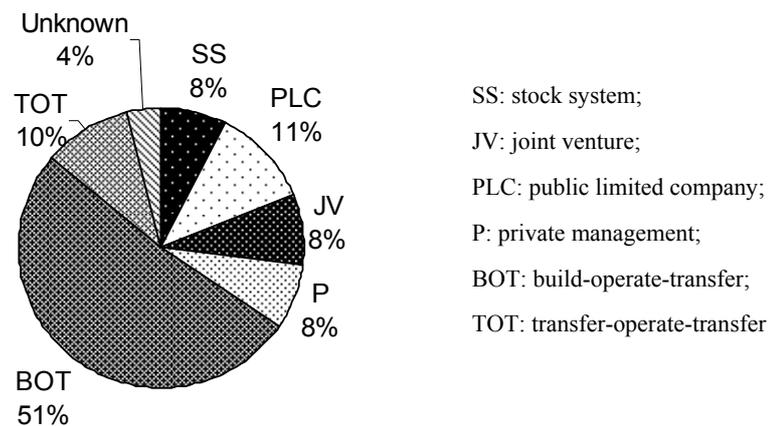
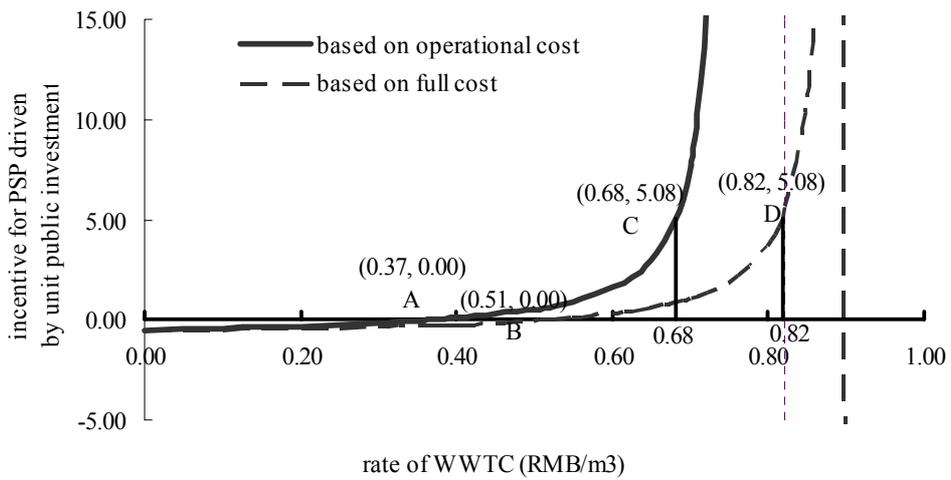


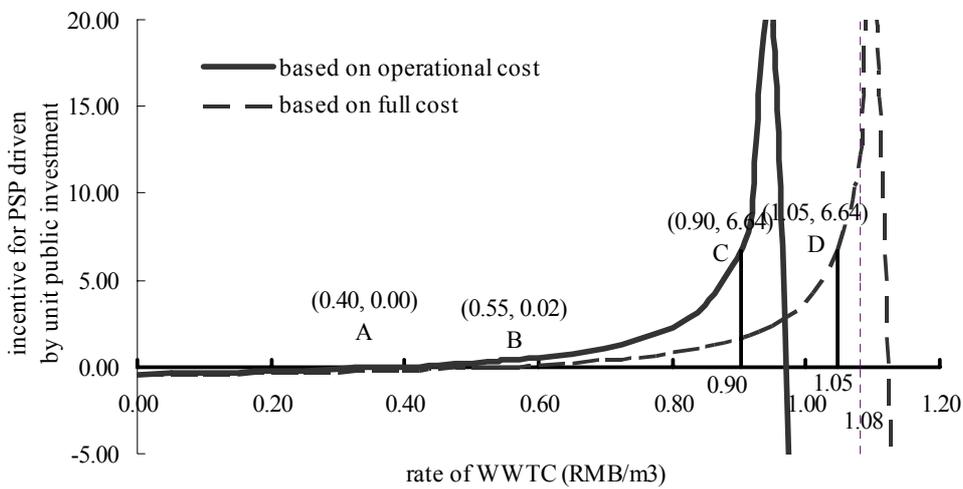
Figure 5.3 The Major PPP Types Applied in China's Wastewater Sector

The PPP structure above is due mostly to the low WWTC rate. This is because different PPP approaches are of different financial risks, and they could have different reliance on WWTC rates. If a private sector is interested at asset ownership, for instance, it will depend more strongly upon the WWTC rates. This could explain why the joint venture type of PPP in China is only at a small percentage in the wastewater sector, much lower than in other industries. On the other hand, however, the wide practice of BOT-type PPP is due mostly to its association to a contracting price between the government and corporation, rather than the WWTC rate. In other words, the PPP types in China may be under a considerable constraint to the low WWTC rates, and given the complexity and sensitivity of price reform in China, the BOT type could be still a major form of PPP in China for a while.

Given the fact that the current WWTC rates in China are still at a low level and far from the full-cost, the development of wastewater sector will rely considerably upon subsidies from government. This is particularly so in regions when the rate of WWTC is at a low level. Different WWTC rates would require different scales of public investment to initialize the wastewater market. Or in other words, for different WWTC rates, a given input from the public would attract different amounts of private investments. This is well illustrated by Figure 5.4, where the dependence of private investment scale on the scale of public investment is described with different WWTC rates. As shown by point A and B of this Figure, public investment can bring only a limit capital from the private sector if the WWTC rate is at a lower level than the operational cost. This means that private sector participation depends on public investment at a lower rate of WWTC. On the other hand, however, points C and D suggest that a low ratio of public investment could ensure much more private capital if the WWTC rate is high enough to cover the full cost. For instance, 1 US dollar invested by public financing cannot bring in any investment from the private sector if the WWTC rate is 0.40RMB/m³ (tax included), and can only bring in 0.02US dollar from the private sector at a WWTC rate of 0.55RMB/m³ (tax included); while 1 US dollar of public investment can bring in 6.64US dollar investment from the private sector at a WWTC rate of 0.90RMB/m³ (tax included).



(a) Taxes exclude



(b) Taxed included

Figure 5.4 Dependence of Private Investment Scale on Public Investment

Furthermore, the slow reform process of the water tariff also caused some difficulties for the marketization reform of the wastewater sector. Although charging wastewater

services has been vigorously promoted by central government, practical implementation by local government has not been encouraging. Table 5.1 summarises the water and wastewater billing percentage in China in 2003. It can be found that less than 15% of the 325 cities had a collection rate over 90% and about 15% had a collection rate less than 50%.

Table 5.1 Percentage of WWTC Collection, 2003

Percentage of charge collection	< 30%	30–50%	50–70%	70–90%	>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: NDRC and MOC, 2003)

5.4 Conclusions

The charge reform of WWTC is a crucial step for China's wastewater sector management. In conclusion, the charge reform, in particular the increasing rate level of WWTC, has a direct and important impact on the investment structure and marketization reform process of wastewater sector. As analysed above, private sector participation in the wastewater service sector has a close dependence on the ratio of public investment in the wastewater sector and the rate level of WWTC. The government has to keep a greater investment ratio to initiate the market and induct private investment, particularly because the current WWTC rate is at a low level.

On the other hand, the PPP options in China may be under a considerable constraint to the low WWTC rates, and given the complexity and sensitivity of price reform in China, the BOT type could still be a major form of PPP in China for a while.

References

- General Office of the State Council, 2004. *Circular on Accelerating Water Tariff Reform, Promoting Water Saving and Protecting Water Resource*, No.36 policy paper.
- MOC, 2001. *Survey and Assessment Report on the Home Equipment of Urban Wastewater Treatment*, Ministry of Construction, Beijing, China, (in Chinese).
- MOC, 2005a. *Notice on the Status Quo of National Urban Wastewater Treatment*, September 7 of 2005, (in Chinese).
- NDRC, and MOC, 2003. *Survey Report on the industrializations and martetization of wastewater treatment and MSW Disposal*, Beijing, China (in Chinese).
- Zhong, L.J., 2005. working paper on *Governing Urban Water Flow in Chinese Cities*.

Chapter 6 Participatory Environmental Governance in China: Public Hearings on Urban Water Tariff Setting⁴⁰

Abstract

In the late 1990s China started to expand its market economic reform to the public sector, such as water services. This reform led to major changes in urban water management, including water tariff management. The reforms in water tariff management relate not only to tariffs, but also to the decision-making on tariffs. Water tariff decision-making seems to move away from China's conventional mode of highly centralized and bureaucratic policy- and decision-making. The legalization, institutionalization and performance of public hearings in water tariff management forms a crucial innovation in this respect. This article analyzes the emergence, development and current functioning of public hearings in water tariff setting, and assesses to what extent public hearings are part of a turning point in China's tradition of centralized bureaucratic decision-making, towards more transparent, decentralized and participative governance.

Keywords

Water tariff, public hearing, participative environmental policy-making, China

6.1 Introduction

Since the late 1990s China is expanding its market economic reform from industrial production sectors to the public sector, such as urban water services. A necessary part of

⁴⁰ This chapter contains an article accepted for publication as Zhong, L.-J., and Mol, A.P.J. Participatory environmental governance in China: Public hearings on urban water tariff setting, *Journal of Environmental Management* (2007), doi:10.1016/j.jenvman.2007.04.018.

this economic transition in urban water management is – among other things - the reform of water tariffs. For a long period, at least until the early 1980s, the central government managed water services directly and provided water services to consumers at a fairly low charge, or even free of charge. This low price related not only to the idea that water was an abundant natural resource in China, but also to the view that water provision was part of social welfare. Under the highly centralized administrative tradition, it was the central government that entirely controlled the price level of water services (Shao, 2001). Various stakeholders and the public were completely absent in the process of pricing and awareness was lacking of the possibility and desirability of public participation in water management. From the 1980s onwards, the government began to gradually charge for water services, starting with drinking water supply, then raw water resources (from the mid 1980s onwards) and finally wastewater treatment services (in the late 1990s). The main reasons behind this change were the mitigation of economic losses of water suppliers and the need to raise investment capital for constructing service facilities to meet the needs of rapid urbanization and industrialization (Song, 2000). The increased pricing of water was further enhanced and strengthened by the worldwide debate on managing water as a public good or an economic good (pushed by Agenda 21 and the Dublin Statement in 1992⁴¹), and by the global debate on privatizing water utilities and services (Guislain and Kerf, 1995; Rivera, 1996; Boubakri and Cosset, 1998; Graw and Maggio, 2000; Lobina and Hall, 2000; Pongsiri 2002; Finger and Allouche, 2002). With the further economic and political integration of China in the world in the 1990s, these international debates accelerated the pace of water tariff reform in China⁴².

The reform of urban water management – of which water tariff reform forms a part - is a complex process and cannot be resolved in a ‘one-shot’, as it involves changes in the institutional arrangements of China’s water management and is closely linked to the various rights and interests of urban stakeholders. Currently, water tariff reform is still in development. New institutions are being constructed regarding not only tariff formulation,

⁴¹ In 1992, the statement at Rio de Janeiro during the WCED claimed that water should be regarded as an integral part of the ecosystem, as a natural resource and as a social and economic good. The charging mechanisms should reflect as far as possible both the true cost of water when used as an economic good and the ability of consumers to pay (Agenda 21, 1992). The 1992 Dublin Statement on Water and Sustainable Development further affirmed that water has an economic value in all its competing uses and that it should be recognized as an economic good.

⁴² During the 1990s the average urban water tariff increased by 363% (Shao, 2001).

structure⁴³ and levels, but also related to the tariff setting process, tariff regulation, financial approaches, governmental subsidies, and – last but not least – public participation.

Via a large number of policy papers a specific arrangement for public participation – public hearing – was developed and experimented upon in water tariff setting since 1997. Public hearing is one of the oldest and most widely applied arrangements to let citizens participate in governance in Western Countries (Checkoway, 1981). There it was originally applied in judicial processes (‘judicial hearing’) and gradually expanded to legislative and administrative processes (‘legislative hearing’ and ‘administrative hearing’) respectively (Checkoway and van Til, 1980; Cole and Caputo, 1984). Since 1996, China started to experiment with Western arrangements of public hearings, first on administrative penalties in 1996 and then also on pricing. Subsequently, it stipulated the application of public hearings for price setting in 1997, in the *PRC Price Law*. More recently, in the *PRC Legislation Law* (2000), public hearings were proposed as an instrument for stakeholder participation in processes of lawmaking (Liu, 2004). Public hearings have been applied also in environmental governance, for instance public hearing with respect to designing environmental regulations, public hearings within Environmental Impact Assessment processes, such as on Yuan Ming Yuan Imperial Garden, and public hearings for water tariff setting.

According to the laws mentioned above, the aim of public hearings is twofold: to improve the effectiveness of decision-making and to increase the accountability of governance. With these public hearings, the authoritative and monopolistic Chinese government seems open to more participatory forms of (environmental) governance, marked by the institutionalization of stakeholder involvement and public participation in decision-making processes. This paper analyses developments in the current system of public hearings in Chinese water tariff setting as part of a development towards more participative environmental governance. To what extent have these public hearings been applied on urban water tariffs? How far is the institutional arrangement of public hearing under the control of the government? In what way are stakeholders and the public represented in these hearings, and to what extent is their participation genuine? And do these public hearings also shape and affect the final outcomes of decisions? After reviewing

⁴³ The current structure of water tariff has expanded further, covering now four major parts: a water resource fee, water engineering costs, water supply costs, and wastewater treatment charge (the State Council, 2004).

ideas of participative policy making, this article tries to answer these questions by reporting on specific case studies and more extended field surveys. The final section provides an assessment of the current status and future prospects of public hearings as emerging forms of participative environmental governance in China.

6.2 Participative Policy-Making and Public Hearings

Increased public participation in policy-making has been advocated around the world not only for its democratic properties but also for its potential to contribute to a more effective, efficient and accountable system of governance. Participative forms of governance can be seen as part of processes of political modernization (van Tatenhove *et al.*, 2000; Mol, 2002), where the conventional state monopoly in governance runs against the boundaries of a new (global) order and needs to be modernized. The argument for enhanced public and stakeholder participation often rests with the merits of the process, the quality of the policy outcomes and implementation, and the belief that an engaged citizenry is better than a passive citizenry (King *et al.*, 1998; Putnam 1995; Arnstein 1969).

Debates in the literature concerning participative policy-making focus on the various institutional arrangements for participation, discussing what forms of citizen and stakeholder participation is best from a range of criteria, among which effectiveness, democracy, equity, and quality of decisions (Konisky and Beierle 2001). As Smith (1983) argued, public participation encompasses various procedures designed to consult, involve, and inform the public such as to allow those affected by a decision to have an input into that decision. As such, 'input' is a key phrase for participative policy-making, referring to the institutional setting and (effective) means the public should be provided to participate. A range of forms of public participation are often distinguished, such as public opinion surveys, consumer councils, public hearings, consensus conferences, and citizen advisory committee. These methods of public participation have more than incidentally been criticized for failing to lead to credible and effective public management decisions, for the limited representativeness of public interests, for the restricted satisfaction of participants/the public, and for failing to give participant a real impact on governmental decisions (Heberlein 1976; Swell and Phillipa, 1979; Blahna and Yonts-Shepard, 1989; Burch, 1976; Cortner, 1996; Lauber and Knuth, 1998; Halvorsen, 2001). Nevertheless,

public hearings have been widely applied in the Western Countries to increase participation in policy-making (cf. Checkoway, 1980; Fiorino, 1990; Liu, 2004).

With more business-oriented managerial arrangements and instruments introduced in public sector service delivery, greater attention is paid to the quality of public services. These new regimes of management have sought to make public service more accountable and responsive to those who use them (Fenwick and Snape 1996; Fenwick 1989). Thus, policy-makers, service providers and consumer groups have called for a more intensive participation of service users in the governance and delivery of a range of public services, among which are water services (Richard and Johnston, 2005). In response, service providers have been engaged in creating a range of alternative forms of user participation (such as consumer councils, panels and forums, and/or participation in governing bodies) to supplement more traditional methods of hierarchical, non-participatory service provision (Stewart 1997; Lowndes *et al.* 2001a, 2001b). Schemes for enlarging participation in decision making and service provision require a change from a narrow concept of consumers to a wider category of citizenship, empowering users with policy co-making instead of just policy-taking roles (Walsh 1994; Rhodes 1987). By the same token, it is believed that the public has to learn to assert their rights and needs in participative processes (e.g. Gyford 1991). Thus, the establishment of participative decision-making mechanisms and arrangements requires training, learning and experimenting of governmental authorities, service providers and the public. This is as much true in contemporary China, as it has been for the liberal democracies when they started to become engaged in participative processes.

The public has been largely absent in Chinese policy-making for a long time. Policies were generally regarded as the sole responsibility of the government and Party, and during the last decades it was unthinkable for the public to enter into dialogue with the government and play a role in policy-making. Against this background it is understandable why the Chinese government experiments with public hearings as the preferable form of public involvement in decision-making processes, and has institutionalized public hearings as compulsory steps in various laws. In encouraging and developing public participation in governing social and environmental issues, such as resource conservation and environmental protection, public hearings are relatively 'mild' forms of participation. Public hearings do not necessarily threaten the fundamental position of the Chinese state

(and the Communist Party). But public hearings do indicate that enhanced opportunities are provided to Chinese citizens to play a more formative role in environmental governance.⁴⁴ To some extent, such a larger role of civil society seems also meant to counter balance the increasing (one-sided) influence of markets and the private sector in environmental and natural resources service provision in China. In that sense, experiments with participatory environmental governance should be understood also in close relation to the changing state-market relations that are developing in contemporary China.

Participative policy making is still at an early stage in China, and public hearings in the water sector are arguably the first institutionalized form of participative policy-making. In principle, public hearings can be an important contribution to more public participation in policy and decision making. But whether these hearings in China's water sector really live after these participatory promises depends very much on how the system of public hearings are designed, implemented and executed in practice. In the next sections we elaborate upon the formal structure and lay-out of public hearings in urban water governance in China, as well as on the practices and experiences of actual public hearings on water tariff setting.

6.3 Setting Water Tariffs: Institutionalizing Public Participation

In its urban water management reform, China has made significant policy efforts in reforming water tariffs by issuing a series of policy documents and regulations (ref. Box 6.1). The transformation of China's water tariff setting process during the past decade is at the heart of urban water management reform. This transformation has two dimensions: decentralization and participation. The institutional arrangements for tariff setting are decentralized to local levels, while at the same time increasing numbers of actors are getting involved, among which are governmental agencies at various levels, technical experts, lawyers, economists, (institutional and household) consumers, water companies and other stakeholders. This section reviews the development of water tariff setting institutions in China since the late 1980s.

⁴⁴ The development of environmental NGOs in China during the last decade and the growing importance of environmental complaint-systems in the early 1990s are other indicators pointing in this direction. See for instance Carter and Mol (2007).

Box 6.1 Major Policies and Regulations Related to Water Price Management

- 1987 *PRC Ordinance on Price Management* by the State Council
- 1994 *PRC Ordinance on Urban Water Supply* by the State Council
- 1997 *PRC Price Law* by the Standing Committee of National People's Congress
- 1998 *Administrative Method on Urban Water Supply Price* by formerly National Development and Planning Commission (NDPC)
- 1999 *Circular on the Key Issues for Carrying out the 'Administrative Method on Urban Water Supply Price'* by former NDPC and the Ministry of Construction (MOC)
- 1999 *Circular on Enhancing the Collection of Wastewater Treatment Charges and Establishing the Centralized Municipal Wastewater Treatment System* by the former NDPC, the MOC and the State Environmental Protection Administration (SEPA)
- 2000 *Circular on Enhancing Water Conservation in Urban Water Supply and Prevention of Water Pollution* by the State Council
- 2001 *Opinions on Improving Price Management* by the National Development and Reform Commission (NDRC)
- 2001 *Code of Conduct for Governments to Make Prices (Trial)* by the NDRC
- 2001 *Provisional Methods on Organizing Public Hearing for Governments to Make Prices* by NDRC
- 2002 *PRC Water Law* by the Standing Committee of NPC (issued in 1988 firstly)
- 2002 *Circular on Accelerating the Reform of Urban Water Supply Price* by the former NDPC, the MOF, the MOC, the Ministry of Water Resource (MOWR), and the SEPA
- 2002 *Methods on Organizing Public Hearing for Governments to Make Prices* by NDRC
- 2003 *Circular on Enhancing Urban Water Conservation and Ensuring Safe Water Supply* by the MOC
- 2004 *Administrative Method on Checking & Ratifying Collecting and Managing the Charges for Hydro Engineering Project* by the State Council
- 2004 *Administrative Method on Raw Water Price of Hydro Engineering Projects* by the NDRC and the MOWR
- 2004 *Circular on Accelerating Water Price Reform, Promoting Water Conservation and Protecting Water Resource* by the General Office of the State Council

In China's centrally planned economy, prices for all goods and services were administered by the Central Government. In the *PRC Ordinance on Price Management* (the State Council, 1987), the first Chinese law regarding price management since 1949, prices for all goods and services were classified in three categories, with different levels of central government involvement.⁴⁵ Water tariffs were fixed by the government directly, because water provision was considered a key public service. And, for exactly the same reason, water prices were set at a very low level. So, before 1990 decision-making on water tariffs was the monopoly of the state-bureaucracy. The state-owned water supply companies were governmental divisions, rather than enterprises, and played no role at all in water tariff setting. No professional tariff planning (e.g. balancing costs, incomes, investments, etc.) was organized during the 1980s, and there was no transparency, information disclosure or public participation in tariff decision-making.

The first wave of water tariff increases took place under these conditions in the 1980s, accompanied by the installation of meters for individual (household) water consumers. The central government called for a reform in water service charges⁴⁶ in order to enhance efficient use of increasingly scarce water resources. According to Qing (2001), 80% of the cities increased water tariffs to a greater or lesser degree during the late 1980s. At the turn of that decade, the tariff range for industrial water was RMB 0.2~0.5 per cubic meter⁴⁷, while household water tariffs ranged between RMB 0.15~0.3 per cubic meter; both were far below the actual costs of drinking water production and provision⁴⁸.

⁴⁵ All prices of goods and services were controlled following the principle "all goods and services prices are being decided by authorities of different levels, but comply with the unified policy of the Central Government". This meant that the Central Government had a strong and dominant position in setting prices. But with respect to price setting three categories were distinguished: prices fixed by the government directly [*Zhengfu Dingjia*], prices fixed in terms of governmental regulations [*Zhengfu Zhidaojia*], and prices fixed via market regulation [*Shichang Dingjia*].

⁴⁶ The *Notice on Water Conservation* (Policy paper No. 220, 1980, by the former National Economic and Trade Commission, former National Planning Commission, Ministry of Finance and former National Urban Construction Administration) promised: to abolish the so-called package charge system for domestic water use; to install water meters per building or yard for water; and to charge for water based on the actual water volume consumed. The *Notice on Promoting Urban Water Conservation* (Policy paper No.80, 1984, by the State Council,) introduced a quota system for water use and charged the consumed water volume beyond the quota with a 100% higher price. The *Stipulation on Urban Water Conservation* (Policy Paper No.1, 1988, by the MOC) requested the competent department in charge of urban construction to set quota for water use, and called for charging for water use based on the actual volume consumed per family.

⁴⁷ 1 USD equals 4.783 RMB (exchange rate 1990), a price of around 0.04~0.1USD per cubic metre water for industrial consumers and 0.03~0.06 USD per cubic metre water for household consumers.

⁴⁸ According to the MOC, the average cost of water production during 1999-2003 is about 1.02 RMB/m³ (General Office of the MOC, 2005). Data for 1980s are not available, but it would be above 0.3 RMB/m³.

During the 8th Five Year Plan (1991-1995), China accelerated the pace of moving to a market-based economy, and also made considerable efforts on price management reforms. The *Ordinance on Urban Water Supply* (the State Council, 1994), the first national legislation for water supply management, empowered provincial-level governments⁴⁹ to design water tariff setting procedures at the local level, stimulated them to set water supply tariffs at cost-covering rates, and called on water companies to formulate water tariff plans. Hence, the Ordinance made significant progress towards decentralization and economic reform.

Subsequently, during the next Five Year Plan, the *PRC Price Law* (the Standing Committee of NPC, 1997) created a milestone in the institutional innovation of water tariff setting policies. The Price Law introduced a number of key innovations. Firstly, a clear principle was stipulated that decisions on urban water supply prices⁵⁰ remained ultimately with the government⁵¹. Secondly, the prefecture-level governments (so-called region-level cities)⁵² were empowered to administrate the urban water supply price and to set local water supply prices. This meant a further decentralization of decision-making power to lower level governments. Thirdly, a tariff plan became a requirement for water tariff setting. The water supply company has responsibility for making the tariff plan and to submit it to the local price authority, concretizing the role of the water supply companies in price settings. Fourthly, a higher-level price authority has to record the new tariff planning and inspect the price planning process, which could be regarded as the emergence of a supervising/auditing system for water tariff management. Finally, but not the least, the obligation to organize a formal public hearing during the water tariff setting process was stipulated. This provided various stakeholders and the public legal access to and participation in tariff decision-making processes, and increased transparency on water tariffs decision-making. In addition to the *PRC Price Law*, the *Administrative Method on Urban Water Supply Price* (formerly NDPC, 1998) further operationalized these

⁴⁹ Provincial-level governments also include autonomous regions and the municipalities directly under the Central Government, which form the highest administrative level within China, except for the Central Government.

⁵⁰ The urban water supply price is concluded in the water tariff, which also includes the water resource fee, water engineering costs and a charge for wastewater treatment.

⁵¹ It means that the price is not based on market principles but decided by government (*Zhengfu Dingjia*; see note 5).

⁵² A prefecture-level city (literally "region-level city") or prefecture-level municipality is an administrative division of the People's Republic of China. Together with prefectures, leagues and autonomous prefectures, prefecture-level cities form the third level of the administrative structure, below provinces and above counties.

stipulations with respect to: the price structure and classification of water supply prices⁵³, the measures for setting water supply prices, the procedure regarding tariff application and examination, and the means of collecting water charges and the supervision of that collection.

Following these two major policy documents, the National Development and Reform Commission (NDRC) issued a number of policy papers to further detail and institutionalize the new price management arrangements, focusing on the decision-making process of setting prices. The *Opinions on Improving Price Management* (the NDRC, 2001) requests local governments to set the local catalogue⁵⁴ of goods and services which are priced by the government (following *PRC Price Law* stipulations)⁵⁵. The document emphasizes the obligation to organize public hearings during the decision-making process on tariffs (in order to improve effectiveness and transparency of decision-making) and calls for accelerating the pace of water tariff reform. The *Code of Conduct for Governments to Make Prices (Trial)* (the NDRC, 2001) defines the responsibilities of governments regarding price making. Most important for our analysis is the *Methods on Organizing Public Hearing for Governments to Make Prices* (the NDRC, 2002), which stipulates the principles, rules and procedures for organizing a price public hearing, including the selection of delegates, the roles and responsibilities of stakeholders, and the procedures during hearings. The local price authority is given responsible for the organization and coordination of a public hearing and to define the composition of the delegations and the number of participants from each delegation/stakeholder for the hearing.

Following these – and other - official governmental stipulations decision-making on water tariffs has shifted significantly between the 1980s and the start of the new millennium. This transition can be divided into three phases: pre-1994, 1994-1997, and post-1997 (ref. Figure 6.1).

⁵³ The *Administrative Method on Urban Water Supply Price* groups the water users in five categories: households, the industrial sector, the administrative sector, the business sector and special types of users.

⁵⁴ According to China's price policies and regulations, both the central price authority and local price authorities have to issue a catalogue of goods and services that are priced by governments. The central price authority (under NDPC) controls the prices of goods and services listed in the *National Catalogue*, for example electricity tariffs, while the local price authorities control the ones listed in the local catalogues, for example water tariffs.

⁵⁵ According to Article 18 of *PRC Price Law*, prices of the following goods or services should be decided by the government directly or following the government's opinions: 1) a limited number of specific vital goods related to national economy, 2) a limited number of goods related to scarce resources, 3) natural monopoly goods, 4) important public goods or services, and 5) important welfare services.

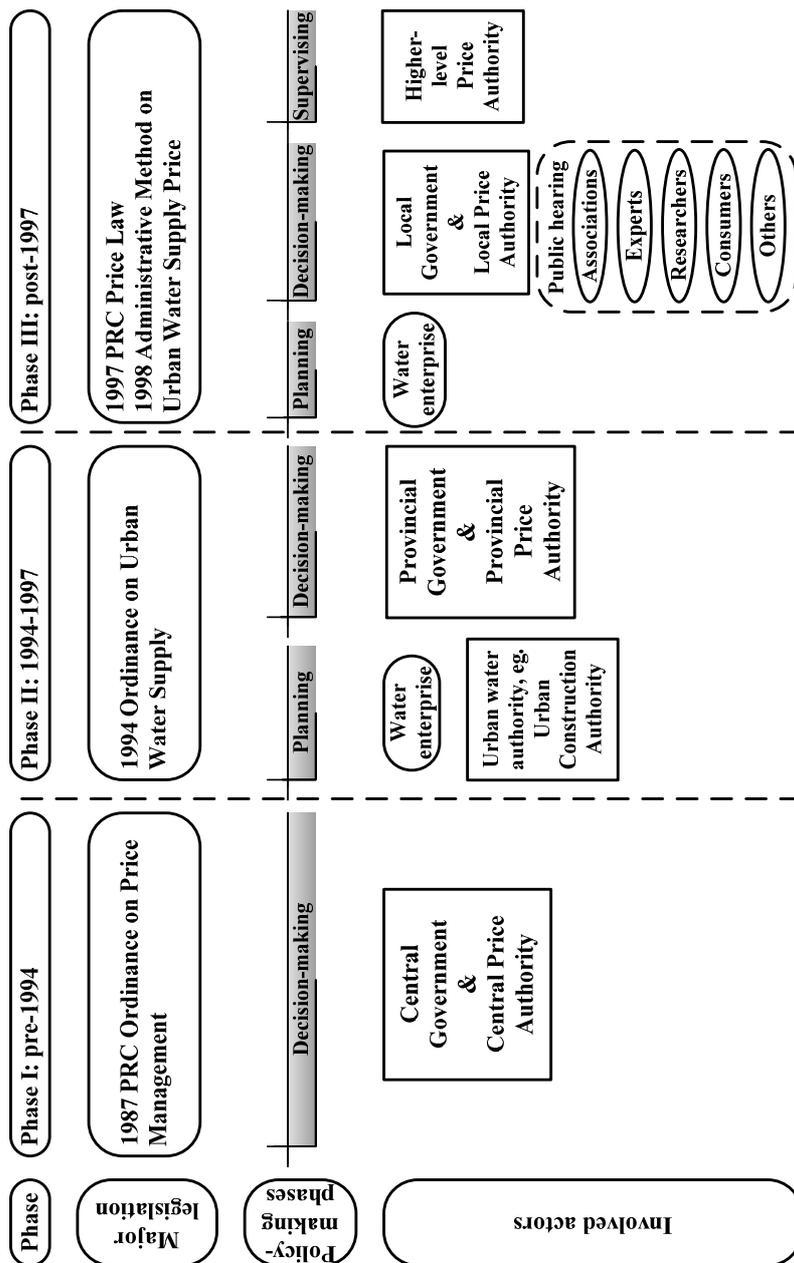


Figure 6.1 Institutional Arrangements and Actors in Water Tariff Setting in China, 1987-2006

6.4 Public Hearings Implemented: Maanshan City and Guiyang

City

But to what extent have the actual water price setting practices moved along with these formal changes reported in policy documents? How have these documents been implemented and executed? What role do public hearings play in water price setting? According to the *PRC Price Law*, ‘public hearing’ is a mandated procedure for setting new water tariffs, both water supply prices and wastewater treatment charges. Based on extensive field work in two cities we will report in this section on the organization and status of public hearings in water tariff setting processes.

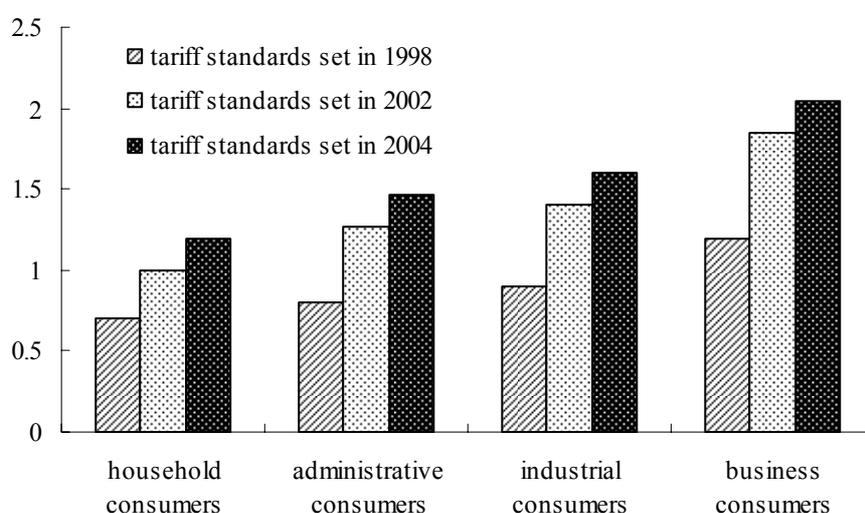
With respect to our analysis there are currently two forms of decision-making on new water tariffs in China. In some provinces, the municipal-level governmental authorities organize the public hearing and decide on the tariff (e.g. in Guangdong, Anhui, Shandong); in other provinces, the municipal-level authorities organize the public hearing, but the provincial-level authorities finally decide on the tariff (e.g. in Guizhou, Shanxi, Liaoning). We analyze in detail the water tariff reform process in Maanshan City⁵⁶ (Anhui Province; type 1) and Guiyang City⁵⁷ (Guizhou Province; type 2). Both cities started early with experimenting with public hearings regarding water tariff setting and have advanced to some degree in institutionalizing these new processes of decision-making.

Since September 1997, the water tariff has increased three times in Maanshan City (ref. Figure 6.2). The 2006 water tariff level was set in 2004 after Maanshan Water Supply Company was reformed into a joint-venture Ltd. company with Beijing Capital Group. The tariff for household consumers increased from 0.70RMB/m³ (in 1998) to 1.20RMB/m³ (currently), with an average annual growth rate of 9.39% over these years. The tariff for administrative consumers (e.g. governmental departments) increased from 0.80RMB/m³ to 1.47RMB/m³ (annual growth rate of 10.67%), for industrial consumers it increased from

⁵⁶ Maanshan City is an industrial, prefecture-level city of 1,686 square kilometres and a population of 1.24 million. Located close to the Yangtze River, it is endowed with abundant water resources. With an average GDP per capita of RMB 19,232 (ca. US\$ 2,325), it ranked no.60 among the 611 Chinese cities in 2003 (National Bureau of Statistics of China).

⁵⁷ The provincial capital Guiyang City is situated at the east of Yungui Plateau and on the north bank of the Nanming River – a branch of Wujiang River. With an average GDP per capita of RMB 11,728 (ca. US\$ 1,418) it ranked no.188 among the 611 Chinese cities in 2003 (National Bureau of Statistics of China).

0.90RMB/m³ to 1.60RMB/m³ (annual growth rate of 10.06%), and for business consumers it increased from 1.20RMB/m³ to 2.05 RMB/m³ (annual growth rate of 9.34%) – all of which are considerable annual increases for basic services. At the same time, the structure/composition of the water tariff has changed as well. A wastewater treatment charge has been collected since 2002, but its rate of 0.10RMB/m³ is far below the operational costs of wastewater treatment, and certainly not enough to cover investments for treatment systems. In 2004, the additional charge for urban construction was discontinued. The current water tariff for household users consists of water supply costs (1.08RMB/m³), a water resource fee (0.02RMB/m³) and a wastewater treatment charge (0.10RMB/m³), which comes to a total of 1.20 RMB/m³.



Source: field survey in Maanshan City, 2004.

Figure 6.2 Water Tariffs for Different Consumers

Maanshan has organized three public hearings for water tariff setting and after the second public hearing the process has become more institutionalized. According to the *Anhui Implementation Regulations on Organizing Public Hearing for Governments to Make Prices* [*Anhui Zhengfu Jiage Juece Tingzheng Banfa Shishi Xize*] (No.165 Price

Policy Paper of Anhui Province, 2003), the municipal governments in Anhui Province are empowered to organize the public hearing for setting local urban water tariffs. In order to institutionalize the procedure of public hearing, Maanshan Price Bureau has specified a manual regarding price public hearings [*Maanshan Jiage Tingzheng Shouce*] (Maanshan Price Bureau, 2003), containing the main regulations, rules and procedures to structure and enforce the price public hearing (ref. Box 6.2).

Box 6.2 Maanshan Price Public Hearings Manual [*Maanshan Jiage Tingzheng Shouce*]

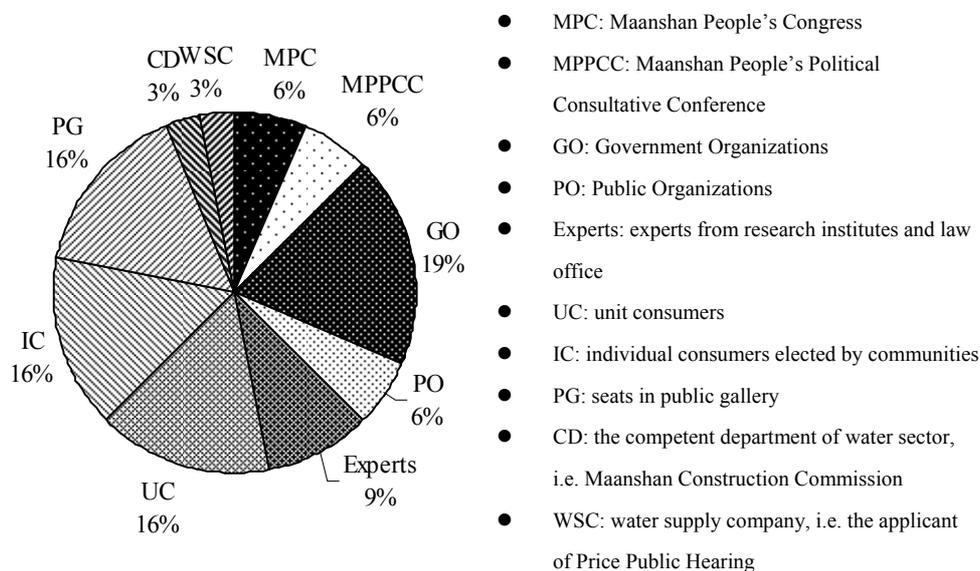
- PRC Price Law
- Methods on Organizing Public Hearing for Governments to Make Price
- Anhui Implementation Regulations on Organizing Public Hearing for Governments to make Prices [*Anhui Zhengfu Jiage Juece Tingzheng Banfa Shishi Xize*]
- Catalogue of Public Hearings [*Tingzheng Mulu*]; price public hearings for specific goods/services required by national, provincial (Anhui) or municipal (Maanshan) levels
- Pricing Catalogue of Anhui Province [*Anhui Sheng Dingjia Mulu*]
- Working documents for the organization of public hearings
 - Application form of price public hearing [*Jiage Juece Tingzheng Shenqing Shu*]; the service provider (e.g. water company) which plans to adjust the price is required to submit an application and required documents to Maanshan Price Bureau for examination;
 - Notification form of accepting/refuting the public hearing application [*Shouli/BuyuShouli Tongzhi Shu*]; Maanshan Price Bureau will notice the applicant (e.g. water company) of the approval or refusal, after having gone through all the submitted documents;
 - Proclamation document for the public [*Gonggao*]; the Maanshan Price Bureau has to inform the public on the preparation and execution of the price public hearing according to specified requirements;
 - Announcement form for the delegates [*Huiyi Tongzhi*], in which the rules for the hearing are specified and which have to be made known to all delegates;
 - Registration form of delegates [*Tingzheng Hui Daibiao Qiandao Biao*], on which the name, organization and contact information for each delegate attending the public hearing has to be recorded;

- Recording form for the price public hearing [*Tingzheng Bilu*]; the contents of all presentations of each delegate have to be recorded and both the speaker and the recorder are required to sign on this form to ensure that all records are adequate reflections of the input of the delegate in the hearing;
- Engagement letter for delegates [*Pinqing Shu*]; this letter of the Maanshan Price Bureau appoints a delegate for a 3-year period after he/she is being elected (often by the organization he/she represents).
- Procedure of public hearing [*Tingzheng Hui Chengxu*]
- Rules of public hearing [*Tingzheng Hui Jilv*]
- Delegates' right of public hearing [*Tingzheng Hui Daibiao Quanli*]
- Delegates' responsibilities of public hearing [*Tingzheng Hui Daibiao Yiwu*]
- Conditions of delegate selection (including visitors) [*Tingzheng Hui Daibiao Tuixuan Tiaojian*]
- Measures on selecting representatives for public hearing [*Maanshan Shi Jiage Tingzheng Daibiao Renshu yu Chansheng Banfa*]
- List of 25 delegates for Maanshan price public hearing (three-year term) [*Maanshan Shi Jiage Tingzheng Daibiao Mingdan*]

(source: Maanshan Price Bureau, August 2003)

The last price public hearing for water tariff was organized through the above regulations and documents in October 2003. A total of 25 delegates and 5 visitors (who can attend the public hearing, but have no speaking and voting rights; excluding reporters and media representatives) attended this Price Public Hearing. The 25 delegates were elected by various organizations (as specified in the government documents) as their representatives (Figure 6.3): 2 were deputies from Maanshan People's Congress; 2 came from Maanshan People's Political Consultative Conference; 6 from other governmental departments and organizations (including the Finance and Economic Committee, the Office of Legislative Affairs, Financial Bureau, Auditing Bureau); 2 from public organizations: the Consumers Association and the Labor Union; 3 from economic research institutes and law offices; 5 from the key institutional water users; and 5 from the individual water consumers. In addition, one deputy of the applicant of Price Public Hearing (i.e. Maanshan Water Supply Company) and one deputy of the water sector department (i.e. Maanshan Construction

Commission) attended the hearing. As such the public hearing formed a platform for 25 delegates from different organizations to discuss the water tariff proposal. In order to provide delegates with ample time to study and understand the new tariff planning, all relevant documents had to be provided to each delegate 10 days in advance.



Source: field survey in Maanshan City, 2004.

Figure 6.3 Participants in 2003 Water Tariff Public Hearing, Maanshan City

The actual public hearing started by the deputy of Maanshan Water Supply Company introducing the reasons for an increase of the water tariff and outlining the details of the new tariff plan. Subsequently, each delegate gave his/her opinions and raised questions to the applicant, followed by a session of answers by the Water Supply Company and further questioning by the delegates. Finally, a voting procedure was conducted. The delegates who agreed with this tariff plan would publicly raise their hand for "yes". The water tariff plan would be approved if a qualified majority (over two-third) of the delegates voted in favor. If not, the proposal would be rejected. Although most delegates questioned the cost structure (in particular the staff salary, which is higher than the average residential income

of Maanshan according to the official of Maanshan Price Bureau), the new water tariff plan was approved by the public hearing and was submitted to Maanshan Municipal Government for consideration and final decision-making. At the same time, the new tariff was submitted to Anhui Price Bureau, the higher price authority, for recording and supervision. On March 31 of 2004, Maanshan Government issued a circular on increasing the water tariff (Maanshan Government, Policy paper No.16, 2004) and the new tariff was implemented on April 1, 2004. In case of a rejection of the water tariff plan by the public hearing, it could not be submitted to the municipal government for further consideration and decision-making. In this case, a new plan would have to be prepared by the Water Supply Company and submitted to another public hearing, consisting more or less of the same delegates (considering their three-year terms).

The price public hearings in Guiyang City are largely similar to the one in Maanshan City, except for the decision-making phase. Also here the delegates are selected from various organizations, and a two-third majority voting is necessary for approval. But after approval by the public hearing the tariff plan is submitted to the higher provincial price authority, Guizhou Price Bureau, for final decision-making. While Guiyang Price Bureau is in charge of organizational matters, it only acts as the consignee of Guizhou Price Bureau, without any decision-making power. On October 29 of 1998, Guizhou Price Bureau organized the first public hearing attended by 60 delegates⁵⁸. Three tariff plans, each with different water tariffs, were presented and discussed. Water tariffs for household consumers, for instance, were 1.2RMB/m³, 1.3RMB/m³ and 1.35RMB/m³, respectively. Over two-third of the delegates voted in favour of the second water tariff plan (Guizhou Price Bureau, 1998).

Interviews with the officials of Guizhou Price Bureau and the study of documents proved that in Guizhou Province at least 14 public hearings for water tariff setting have been conducted since this first public hearing was organized in Guiyang city in October 1998. Thirteen public hearings were conducted after 2003, reflecting the ongoing economic reform in the Chinese water sector and the significant pace of recent water tariff reforms in

⁵⁸ From Guizhou People's Congress, Guizhou People's Political Consultative Conference, Guizhou Construction Bureau, Guizhou Finance Bureau, Guizhou Planning Commission, Guizhou Economic and Trade Commission, Guizhou Industrial and Commercial Bureau, Guizhou Consumers Association, Guiyang Municipal Government, Guiyang People's Congress, Guiyang People's Political Consultative Conference, Guiyang Finance Bureau, Guiyang Urban Administrative Commission, institutional water consumers, and community committees.

China. Not unlike Maanshan City, Guizhou Provincial Government also institutionalized and legalized water tariff public hearings through the *Guizhou Implementation Regulations on Adminstrating Urban Water Supply Price* [*Guizhou Chengzhen Gongshui Jiage Guanli Banfa Shishi Xize*] (No.84 Price Policy Paper of Guizhou Province, 2001). Article 6 of the recent *Guizhou Price Ordinance* (Standing Committee of Guizhou People's Congress, enacted in 2003 and effective since March 1, 2004) is very clear on the status of public hearing in water tariff decision-making: "... the decision would be invalid if the price authority fails to organize a formal public hearing while making prices for goods or services which requires a public hearing for decisions, such as water services...".

Local price authorities in Guizhou Province vary with respect to their power in deciding how many delegates and from which organizations are allowed to sit in the public hearing; for instance, Guiyang Price Bureau was consigned to organize a public hearing on the wastewater treatment charge in November of 2004, in which 27 delegates participated (XinhuaNet, 2004). Sometimes the local price authority even has decisive power in selecting candidates, for instance in the case of delegates from the category individual consumers (see next section). There seems to be no fixed legal procedure for this selection process in Guizhou Province, nor in Maanshan city.

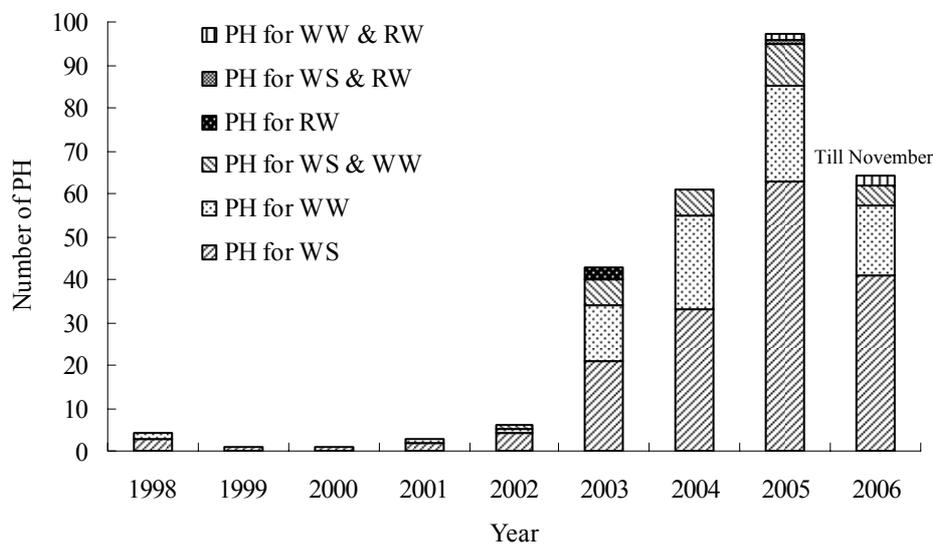
6.5 Public Hearings on Water Tariff Setting

After this more in-depth investigation of public hearings in two locations we now provide a China-wide overview of the emergence of public hearings in the country, with a focus on the amount of public hearings, the participation in public hearings, the influence of hearings on water price settings, and the contribution of hearings to the emergence of participative governance.

Since the *PRC Price Law* was established in 1997, hundreds of formal public hearings on water tariffs have been organized within 30 provinces, excluding Tibet. In particularly after 2002, when a new wave of water tariff increases spread through the country, the number of public hearings have sky-rocketed. From an internet-based survey and field interviews with local price bureaus⁵⁹, over 280 formal public hearings⁶⁰ on water price

⁵⁹ Through an internet survey information was collected from thousands of news articles published on public

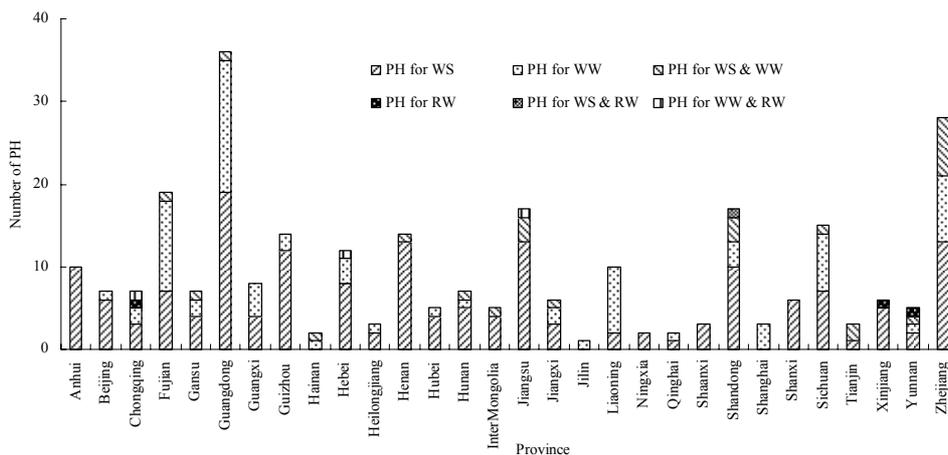
setting could be recorded until the end of November 2006. The public hearings addressed prices and tariffs for water supply, wastewater treatment and raw water (ref. Figure 6.4).



(a) by years

websites in 2005 and 2006, including over 20,000 pieces of news collected via the search engines www.google.com and www.baidu.com. The most popular professional websites regarding Chinese water management are www.h2o-china.com with about 1000 news items over 2005; <http://info.water.hc360.com> with over 600 articles; official governmental websites and specific websites of price bureaus of all provinces; and press websites such as www.cctv.com and www.xinhuanet.com. This survey was complemented by field interviews with local and provincial price authority officials in Guiyang, Maanshan, Jinan, Shengyang, Shenzhen, and Taiyuan.

⁶⁰ The real number of public hearings for water tariffs can be a little higher, as some public hearings might not have been announced and reported in the media, in particular the ones organized before 2002.



(b) by provinces

PH: Public Hearing; WS: Water Supply; WW: Wastewater; RW: Raw Water

Source: survey by the authors

Figure 6.4 Number of Public Hearings for Setting Water Tariffs: per year (a) and per province (b)

Given the fact that China introduced price public hearings only in 1997 through the *PRC Price Law* and accelerated market economic reform in both water supply and wastewater treatment service since 2002, the small number of public hearings before 2001 and the sharp increase after 2002 shouldn't be surprising.

One of the key issues of public hearings discussed in the media is the representatives attending public hearings. From the reported 280 public hearings on water tariff setting between 1998 and 2006, it proved that either the municipal or the provincial price authority was in charge of organizing the public hearings. The sort of delegates and procedure of selecting them were largely similar in most cities: delegates from local People's Congress, from local People's Political Consultative Conference, from local governmental departments, from key industrial/commercial water consumers and experts were generally elected by the organizations they represented. But the selection of individual water consumer formed a major exception. Usually, the announcement of a public hearing goes

together with a public call for people to announce themselves if they want to become delegate in the public hearing. Often a formal or legal procedure to select delegates among these individual consumer candidates does not exist. In some cities (e.g. Hefei, Xiamen, Haikou, Dalian) these delegates were elected by the consumer association; in other cities (e.g. Anyang, Pingdingshan, Yichang) a kind of blind selection took place from all candidates; and in some cities (e.g. our cases Maanshan and Guiyang; but also Shenzhen, Zhuhai, Guilin, Jinan) the local price bureau selected some candidates above others, either after interviewing them all, or without any clear procedure. Incidentally, the local price bureau had even full control over all candidates, with no influence of the organizations that should be represented in the public hearing. For instance, in Fengdu of Chongqing, the delegates to a recent public hearing were all selected and appointed by the local price bureau, giving it a major influence in the outcome of the public hearing (Chongqing Evening News, *Chongqing Wanbao*, 2005). It can be questioned whether under such circumstances delegates really represent the variety and diversity of stakeholders and public opinions, whether they vote freely in favor or against tariff plans, and thus whether we can still call this participative governance.

The number of individual consumer delegates and the selection procedure of these delegates are the most emphasized issues in the media. Increasing the number of delegates from the category 'individual consumers' has become a token gesture for the improved 'democracy' of public hearings in the media. And, as reported in the news, since 2005 this number seems to be increasing: Shenzhen public hearing on wastewater treatment charge in March 2005 had 10 individual consumers (45% of a total of 22 delegates; *Guangzhou Daily, Guangzhou Ribao*, March 25, 2005); Guilin public hearing on water supply price in July 2005 contained 9 individual consumers (36% of a total of 25 delegates; *Nanguo Morning News, Nanguo Zaobao*, July 6, 2005); Zhuhai public hearing on water supply price in August 2005 consisted of 6 individual consumers (28% of a total of 21 delegates; *Nanfang City News, Nanfang Dushi Bao*, August 31, 2005); and for Changsha public hearing on water supply price and wastewater treatment charge on 15 December 2006 15 individual consumers were selected from 109 applicants (60% of a total of 25 delegates; *Changsha Evening Paper, Changsha Wanbao*, November 28, 2006). It can be questioned whether the increased number of delegates from individual consumers improves the democratic qualities of public hearings, when the selection process and the issue of representation

remain obscure. But it does enhance the participatory qualities of the water tariff setting process (as also confirmed by Yang, 2003).

While only a very limited number of persons can actually be involved in public hearings, there are increasing attempts and practices in various cities for a wider involvement of citizens in pricing politics, through online and media (newspaper, radio, TV) reporting and discussions with price authorities (Ningbo Daily, 2006). This helps in further disseminating ideas and experiences of participative policy- and decision-making to a wider public. For instance, Ms. Cui Lanying, who attended several public hearings as a delegate of individual water consumers (including the first Beijing water tariff public hearing in 1998) introduced her experiences in a special program on Beijing TV (Beijing Xinhua, 2004):

“It was impossible for me to have thought of participating in the governmental decision-making process and representing the voice of the public to the government before 1998. It is a great change and progress that the government is patient to hear the voice of the public and respect the public’s suggestion on urban management. This reflects that the city belongs to all people and everyone could contribute to management affairs.”

And in April 2006, Mr. Luo Zhili, Mr. Wu Ruwen and 11 other farmers, as delegates of 11 thousands residents, participated in a water tariff public hearing in Nayong County, Guizhou Province. Mr. Luo was cited in the media that he understood the public hearing as “to let the public make a decision” though he couldn’t catch the exact meaning of this term (Guizhou Daily, *Guizhou Ribao*, 2006).

To investigate the familiarity and perception of water tariff public hearings among Chinese urban citizens a survey was organized in 17 cities in January to March 2006. A questionnaire was distributed among a representative sample of 2050 households, and 1834 valid questionnaires were returned (see Table 6.1). Almost 50% of the urban residents knew public hearings for setting new water tariffs, and over 40% indicated their considerable interest and actively followed the result of these public hearings via the media. Figure 6.5

illustrates that the proportions of knowledge on and interest in water tariff public hearings were high in with considerable experience in price public hearings (e.g. Beijing, Guangzhou, Guiyang, Haikou, Jiaozuo, Jilin, Jinan, Guangxi, Urumchi, and Wuhu). In cities with few or no (reported) water price public hearings knowledge and interest was also low (e.g. Benxi, Macao, and Shahe). At the same time (early 2006), a more or less identical online questionnaire was conducted by ChinawaterNet (www.h2o-china.com), raising 938 effective respondents of a much more selective group in one and a half month. Almost 80% of them knew the institution of public hearings in water tariff setting, and close to 60% expressed a major interest in and actively searched on public hearings. Together these questionnaires indicate that the spreading of and interest in the idea of public hearing moves beyond a selected group of individual consumers participating as delegates in such hearings. Chinese urban citizens are not only concerned with access to information on the relevant costs for water, but also with the process of decision-making and the opportunities to let their voices be heard.

Governmental authorities strongly defend - in the media, in official publications and in our interviews - public hearings as an effective instrument to make decision processes on water tariffs more transparent, participatory and even democratic. But the implementation of public hearings are arguably also instrumental in mitigating and channeling resistance against current significant increases in water tariffs, both through a better public understanding - through these hearings and the media reporting on the hearings - for the need to increase (waste) water charges, as through increased legitimacy of the process. Our internet-based survey shows that tariff plans for wastewater treatment charges are seldom rejected by public hearings, even if major increases are proposed. Public hearing rejections on water supply tariff increases are more common. But in all, over 90% of all the 280 reported public hearings resulted in an approval of the submitted water tariff proposal. The overall view from these public hearings is that in particular individual consumer delegates agreed on the necessity to increase current water tariffs, but argued for a lower tariff as compromise. Low wastewater charges compared to water supply tariffs, and the growing public concern on water pollution, can be held responsible for lower level of rejections of wastewater charge plans.

Table 6.1 Number of Questionnaire Samples in 17 Cities

Cities	N. of household water consumers (1,000 household) ^(a)	N. of public hearings reported	N. of questionnaires	N. of respondents
Beijing	2762.2	7	300	272
Benxi	223.4	0	100	98
Dalian	879.2	1	100	91
Guangzhou	1840.6	1	100	94
Guiyang	500.0	3	150	119
Haikou	46.2	1	100	91
Hohehot	275.0	1	100	93
Jiaozuo	51.9	1	100	93
Jilin	389.5	1	100	95
Jinan	32.8	2	200	157
Macao ^(b)	-	0	100	96
Nanning	44.2	2	100	83
Shahe	27.7	0	100	93
Tianjin	2211.3	3	100	96
Urumchi	433.2	1	100	87
Wuhan	801.4	1	100	81
Wuhu	237.4	1	100	95
Total	-	-	2050	1834

Note: (a) data in 2004 (MOC, 2005b)

(b) data not available

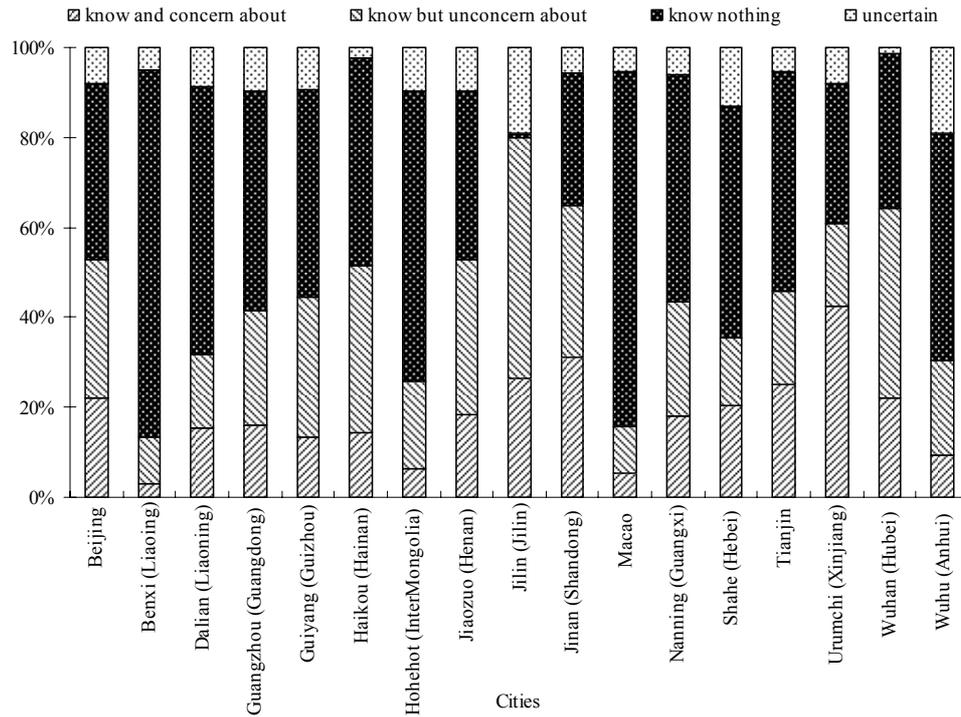


Figure 6.5 Residents' Perception and Familiarity on Price Public Hearings in 17 Cities

Behind the approval and rejection rates we found a variety of explanations and further qualifications on the functioning of public hearings. A debate is emerging in China on whether the institution of public hearing functions as effective, participatory and fair as originally expected and planned in China. Some citizens question the value and influence of current public hearings and believe governments only formally organize public hearings, without letting this new institution have any real power or influence. And examples can indeed be found. For instance, Fengdu, a district of Chongqing, failed to pass the water tariff plan during its 2005 public hearing, but the local government increased the water tariff anyhow, without taking the result of the public hearing into consideration (Chongqing Evening News, *Chongqing Wanbao*, 2005). In this case, the overruling of the public hearing was reported but one can expect other cases where media coverage is suppressed. In contrast, in other cities public hearings did have a major influence. For instance, the

2003 public hearing of Luohe City, Henan Province, rejected initial plan to increasing the water supply price. Three months later, the water company submitted a revised tariff plan to a new, second public hearing; this plan reflected the comments from the earlier public hearing (Dahe News, *Da He Bao*, Aug 6 of 2003). Similarly, in July 2004, a public hearing on water supply price increase organized in Qidong City of Jiangsu Province rejected the proposed tariff plan and the water company was forced to make a new plan and submit it to a second public hearing in May 2005 (Qidong News Center, 2004, 2005). The second public hearing approved the revised tariff plan. In June 2004, the Beijing Development and Reform Commission (BJDRC) organized a price public hearing on an increase of the water supply price and wastewater treatment charge and the installment of a so-called block tariff approach (The Beijing News, *Xin Jing Bao*, June 3 of 2004). While a majority of the 28 representatives agreed to increase the water supply price and the wastewater treatment charge, there was wide disagreement on the implementation of the block tariff approach, due to several existing constraints, such as the low rate of metered households. Following the public hearing, BJDRC postponed the block tariff approach. Obviously, decentralization in water governance results in differences in the implementation and execution of the public hearing articles of the *PRC Price Law*.

Overall the institution of public hearing has contributed in four ways to the actual reform of decision-making on Chinese water tariffs. Firstly, public hearings made government decision-making processes more transparent and legitimized, and difficult decisions as price increases more acceptable. Secondly, through public hearings the public is encouraged to ventilate their opinions on urban water management, either directly at the hearing but also through the media and online. Governmental knowledge on such public discussions, attitudes and ideas is likely to have lead to more reasonable, balanced and feasible price proposals, taking in advance (potential) comments of different stakeholders into account. Thirdly, Chinese citizens have been exposed, directly or indirectly, to new more participative forms of governance. And finally, at least in a number of cases public hearings had a direct impact on governmental decisions regarding water tariff setting in cities.

6.6 Conclusions

In the literature on participation and empowering the public, the classic 'ladder of participation' (Arnstein, 1969) charts a sliding scale from information provision through consultation, placation, partnership, delegated power to citizen control. Thus a continuum is drawn from symbolic tokenism to real power-sharing, each with different implications for citizen participation and democracy. From the experiences with price public hearings in recent years in China, as analyzed in this article, the power and influence of participants from various governmental departments, industries, organizations, and individual households go beyond mere symbolic tokenism or information reception. At the same time it is difficult to define the position of current price public hearings in China in terms of partnership or delegated power, according to Arnstein's standards. For that the state has still too much direct and indirect control over the representatives at the public hearing, the public hearing can only react upon state initiatives, and the possibilities for governments to surpass the verdict of the public hearing are obviously still there. The public hearing definitely empowers different stakeholders and the public in price setting decision-making, and this empowerment is increasingly formalized and institutionalized. But this participation takes place against the background of a still largely undemocratic and non-participative system, and the specific rules, procedures and implementation freedom give local governments still decisive power.

The emergence of the institution of public hearing in water tariff setting cannot be understood if we do not take the wider processes of reform in China into account. The changing relations between state, market and civil society are reflected in the development of water services, and the water tariff setting. Water supply companies become more independent and (economically) accountable, and tariffs for water supply and wastewater treatment are increasingly determined on economic grounds and less on purely political-administrative motives. In such a setting public hearings fulfill various functions: they balance a purely market economic motive and rationale in price settings now that the state role is reducing; they balance various interests - from state bureaucracies, water providers and private consumers - in price settings and tariff plans; they make price increases more legitimized, acceptable and thus water companies also publicly accountable; and – last but not least – they are experiments and learning processes with citizen

participation in decision-making: for state agencies, for private organizations and for the public.

Public participation via hearings is also widely applied in Western Countries, but has a different outlook and performance in China due to its different economic, social and political context. Among others, it is typical that one of the early experiments with public hearings in China is on price settings, and not on more conventional (environmental) policy issues as seen in Europe and the US. But the objectives of public hearings in both contexts are not too different: to provide the public insight in, access to and influence on governmental policy making processes. To date, water pricing in China is still under governmental control, as the state authorities have the final decision right on water tariff setting. But, again, this is not too different from what can be witnessed in several liberal democracies, where price levels of basic services can be - and sometimes are – corrected via the state.⁶¹

Though the debate of whether public hearings are an effective and fair mode of public participation in governmental decision-making in China is still ongoing, it is safe to conclude that current Chinese experiments with public hearings on water tariffs (and other services) mark a promising start of a larger public input in governmental decision-making. But much room for improvements remains, for instance with respect to widening the scope and degree of public involvement, the selection of participants, the organization of hearings, the voting procedures, the implementation of hearing outcomes, and the right of initiative. In that sense, Chinese public hearings are hopeful signs of a movement towards more participative governance, but there is still much to improve.

References

- Arnstein, S.R., 1969. A Ladder of Citizen Participation. *Journal of the American Institute of Planners* 35(3): 216-24.
- Beijing News [*Xin Jing Bao*], 2004. Beijing is organizing a public hearing for new water tariff. June 3, 2004. In: <http://www.h2o-china.com/news/22795.html>.

⁶¹ In the case of liberal democracies it is usually the democratically elected parliament - or a lower level representative institution - that triggers discussions and corrections on market-based price levels of, for instance, water or energy.

- Beijing Xinhua, 2004. Water tariff: closely linked to Beijing residents. June 3, 2004. In: http://www.bj.xinhuanet.com/bjpd_sdzx/2004-06/03/content_2245647.htm.
- Blahna, D.J., Yonts-Shepard, S., 1989. Public involvement in resources planning: Toward bridging the gap between policy and implementation. *Society and Natural Resources* 2:209-227.
- Boubakri, N., Cosset, J.C., 1998. Privatization in Developing Countries. In: *Public Policy for the Privatesector*, Note No.156, November 1998: the World Bank.
- Burch Jr., W.R., 1976. Who participates – a sociological interpretation of natural resource decision. *Natural Resources Journal* 16:41-54.
- Carter, N.T., Mol, A.P.J. (Eds), 2007. *Environmental Governance in China*, London: Routledge
- Changsha Evening Paper [*Changsha Wanbao*], 2006. Changsha Price Bureau announced the list of representatives for the public hearing of wastewater treatment charge, November 28, 2006. In: <http://www.h2o-china.com/news/44108.html>.
- Checkoway, B., 1981. The politics of public hearing. *Journal of Applied Behavioural Science* 1981, 17(4), 566-583.
- Checkoway, B., Van Til, J., 1980. *What do we know about citizen participation? A selective review of research*. In S. Langton (Ed.), Mass.: Lexington Books, 1974.
- Chongqing Evening News [*Chongqing Wanbao*], 2005. Fengdu Chongqing: Water tariff increased in spite of the rejection from price public hearing. November 24, 2005. In: <http://www.h2o-china.com/news/34350.html>.
- Cole, R.L., Caputo, D.A., 1984. The public hearing as an effective citizen participation mechanism: A case study of the general revenue sharing program. *The American Political Science Review* vol.78, No.2 (June 1984): 404-416.
- Cortner, H., 1996. Public involvement and interaction. Pages 166-179 in A.W. Ewert (eds), *Natural resource management: The human dimension*. Westview Press, Boulder: Colorado.
- Dahe News [*Da He Bao*], 2003. Consumer Association query the public hearing. Aug 6, 2003. In: www.hbby.com.cn.
- Fenwick, J., 1989, Consumerism and local government, *Local Government Policy Making* 16, 1(June):45-52.
- Fenwick, J., Snape, S., 1996. Closer to the customer? Local government and international experience, *Public Policy and Administration* 11, 4(Winter):45-55.
- Finger, M., Allouche, J., 2002. The Transformation of the Global Water Sector: the Role of the World Bank and 'Public Service TNCs'. *Working paper de l'IDHEAP*, No.6, April 2002.

- Fiorino, D.J., 1990. Citizen participation and environmental risk: A survey of institutional mechanisms, *Science, Technology, & Human Value*, vol. 15, No.2. (Spring, 1990), pp.226-243.
- General Office of the MOC, 2005. Survey report on the cost of water supply companies of key cities between 1999 and 2003. *Investigation, Research and Information*, No.13, March 25 of 2005.
- Graw, K.U., Maggio, E., 2000. The public-private-partnership approach: a solution for water distribution and wastewater drainage in megacities. In: Maione, Majone Lehto & Monti (eds) *New Trends in Water and Environmental Engineering for Safety and Life*, Balkema: Rotterdam.
- Guangzhou Daily [*Guangzhou Ribao*], 2005. Shenzhen: Hearing for adjusting wastewater treatment charge, March 25, 2005. In: <http://www.h2o-china.com/news/28796.html>.
- Guislain, R., Kerf, M., 1995. Concessions – The Way to Privatize Infrastructure Sector Monopolies, in: *Public Policy for the Privatesector*, Note No.59, October 1995: the World Bank.
- Guizhou Daily [*Guizhou Ribao*], 2006. Water tariff could be decided by the masses. April 11, 2006. In: <http://www.h2o-china.com/news/38085.html>.
- Guizhou Price Bureau, 1998. "First Price Public Hearing in Guizhou Province", *Guizhou Price Information*, vol. 22, 1998.
- Gyford, J., 1991, *Citizens, Consumers and Councils*, London: Macmillan.
- Halvorsen, K.E., 2001. Assessing public participation techniques for comfort, convenience, satisfaction, and deliberation. *Environmental Management*, Vol.28, No.2:179-186.
- Heberlein, T.A., 1976. Some observations on alternative mechanisms for public involvement. *Natural Resources Journal*. 16:197-212.
- King, C.S., Feltey, K.M., Susel, B.O., 1998. The Question of Participation: Toward Authentic Public Participation in Public Administration. *Public Administration Review* 58(4): 317-26.
- Lauber, B.T., Knuth, B.A., 1998. Refining our vision of citizen participation: Lessons from a moose reintroduction proposal. *Society and Natural Resources*, 11:411-424.
- Liu, M.Y., 2004, *Chinese Hearing Procedure Study*. Beijing, China: China Legislation Press.
- Lobina, E., Hall, D., 2000. Public Sector Alternatives to Water Supply and Sewerage Privatization: Case Studies. *Water Resource Development*, Vol.16, No.1, 2000:35-55.
- Lowndes, V., Pratchett, L., Stoker, G., 2001a, Trends in public participation: Part 1 – Local Government perspectives, *Public Administration*, 79(2):205-22.
- Lowndes, V., Pratchett, L., Stoker, G., 2001b, Trends in public participation: Part 2 – Citizens' perspectives, *Public Administration*, 79(2):445-55.
- MOC, 2005b. Statistical Yearbook of Chinese Urban Construction of 2004, China Architecture & Building Press: Beijing.

- Mol, A.P.J., 2002. Political Modernisation and Environmental Governance: between Delinking and Linking, *Europaea. Journal of the Europeanists*, 8, 1-2, pp.169-186
- Nanfang City News [*Nanfang Dushi Bao*], 2005. Zhuhai intending to increase the water price by 37%, September 5, 2005. In: <http://www.h2o-china.com/news/32378.html>.
- Nanguo Morning News [*Nanguo Zaobao*], 2005. Nanning City increasing the water price, November 2, 2005. In: <http://www.h2o-china.com/news/33746.html>.
- Ningbo Daily [*Ningbo Ribao*], 2006. Ningbo Zhejiang: Citizens discussing how to adjust the water tariff. May 18, 2006. In: <http://www.h2o-china.com/>.
- Pongsiri, N., 2002. Regulation and public-private partnerships, *The International Journal of Public Sector Management*, Vol.15. No.6, 2002:487-495.
- Putnam, R. D., 1995. Bowling Alone: America's Declining Social Capital. *Journal of Democracy* 6(1): 65-78.
- Qidong News Center, 2004. Views on Qidong public hearing for water tariff. July 25, 2004. In: <http://www.h2o-china.com/news/23888.html>.
- Qidong News Center, 2005. Public hearing is organized for new water tariff in Qidong, Jiangsu. May 23, 2005. In: <http://www.h2o-china.com/news/30064.html>.
- Qing, Y., 2001. *Introduction of Chinese urban water supply prices and wastewater treatment charges*, speech on the Sino-Denmark workshop on urban water supply price and wastewater treatment charges, Beijing, 5 July 2001. In: <http://www.cin.gov.cn/indus/speech/2001072303.htm>.
- Rhodes, R.A.W., 1987. "Developing the public service orientation: or let's add a soupcon of political theory", *Local Government Studies*, May/June: 66-73.
- Richard, S., Johnston, B., 2005. A Joined-up Approach to User Participation in Public Services: Strengthening the "Participation Chain", *Social Policy & Administration*, 39(3):260-283.
- Shao, Y.S., 2001. Water Tariff Reform and Public Participation, in: proceeding regarding "21st International Urban Wastewater Treatment and Reuse Development Workshop", Beijing, November 27-29, 2001.
- Smith, L.G., 1983. *Impact assessment and sustainable resource management*. Harlow, UK: Longman.
- Song, X.T., 2000. Characteristics and Countermeasures regarding the Development of China's Urban Water Supply and Sewerage, *China Water & Wastewater*, 2000 (1).
- Van Tatenhove, J., Arts, B., Leroy, P., 2000. Political Modernisation. In: van Tatenhove *et al.* (eds.), *Political Modernisation and the Environment: The Renewal of Environmental Policy Arrangement*. Kluwer Academic Publishers: The Netherlands.

- Walsh, K., 1994. Citizens, charters and contracts. In: R. Keat, N. Whitely and N. Abercrombie (eds), *The Authority of the Consumer*, London: Routledge.
- Xinhuanet, 2004. Guiyang increasing the wastewater treatment charges by 0.20RMB per cubic meter, June 18, 2005, in: <http://www.h2o-china.com/news/23118.html>.
- Yang, K.F., 2003. Assessing China's public price hearings: Symbolic aspects, *International Journal of Public Administration*, Vol.26, No.5, pp.497-524.

Chapter 7 Conclusions

7.1 Introduction

This study aimed to investigate the institutional innovation and tradition in Chinese urban water sectors from an Ecological Modernization perspective. Four core research questions have been leading this study. First, how can we understand and interpret the institutional transformations that are taking place in Chinese urban water sectors? Second, how are water policies implemented at the local level? What are the reasons behind differences in policy implementation between provinces? Third, to what extent can these institutional changes be successful in combating problems of Chinese urban water governance? Fourth, what can we learn from the institutional changes of Chinese urban water governance for the further development of Ecological Modernization theory in China?

These research questions have been approached with the help of a theoretical framework – modernizing urban water governance – that takes into account the key principles of urban water governance on the one side and the basic elements of the theory of Ecological Modernization on the other side. Chapters 3, 4, 5 and 6 have provided in-depth analyses on three concrete institutional transformations (i.e. introduction and implementation of price policies, an increase in private sector involvement, and public participation in the decision-making process of setting water tariffs) taking place in current Chinese urban water sectors. This concluding chapter subsequently provides answers to the research questions (Section 7.2) and discusses the contribution of the empirical findings to the theory of Ecological Modernization (Section 7.3 and 7.4). The last section (Section 7.5) presents the implications for the future empirical and theoretical research.

7.2 Institutional Changes for Modernizing Urban Water

Governance in China

In order to deal with the research questions and theorize the institutional innovations of Chinese urban water governance, in Chapter 2, four core elements of Ecological Modernization theory (technological innovations, state-market relations and political modernization, economic agents and economic and market dynamics, and civil society and NGOs) have been presented as the basis of a theoretical framework. In this thesis, the technological dimension was not further investigated. Following these sensitizing premises, three major empirical findings on environmental-induced institutional transformations of China's urban water sectors can be concluded.

(i) Increasing importance of economic and market dynamics in China's urban water governance

At the start of this new millennium, China accelerated the marketization reform by including public utility sectors (e.g. water supply, wastewater, waste, public transport, and gas supply)⁶² and by emphasizing the power of economic agents and market dynamics to address environmental problems⁶³. In this thesis it has been illustrated how and to what extent this happened with respect to the urban water sector.

In dealing with the roles of economic and market dynamics in China's urban water sector, Chapter 3 provided an in-depth investigation on how and to what extent the economic or price instruments are introduced into China's urban water sector and how these pricing policies are implemented at the local level in urban water tariffs. Chapter 4

⁶² The official kick-off of marketization reform in public utility sectors was symbolized by the promulgation of the *Opinions on Accelerating the Marketization of Public Utilities* (No.272 Policy Paper, the MOC, 2002). It claims to open public utilities to both foreign and domestic investors, and calls for multi-financing approaches, concession rights and concession management, pricing mechanism, and a reduction of government monopolies and roles.

⁶³ In April 2006, Premier, Wen Jiabo, at the Sixth National Environmental Conference, emphasized the importance of three transitions for environmental governance: the transition (1) from a focus on economic growth to one on environment and development; (2) from environment as a secondary objective to one of equal importance with economic growth; and (3) from the primary use of administrative methods of environmental management to a more comprehensive system (such as the introduction of market dynamics) (cf. Xue et al., 2007).

and 5 demonstrated the emergence and development of private sector involvement in the current reform process of China's urban water sector in which market dynamics have been emphasized as one of the core mechanisms for establishing a new governance structure of China's urban water sector.

As in most countries, the pricing policies in China's urban water sector are meant to meet various goals such as covering increasing costs, protecting scarce natural resources, and introducing economic stimuli for efficient use of these resources. The empirical analyses in Chapter 3, on the one hand, have witnessed several (potential and actual) benefits in China's urban water sector due to the use of economic instruments, such as increased revenues, more available funding, and a decrease in water consumption per capita or unit of GDP. On the other hand, it showed some major challenges that China is facing during the implementation process of pricing policies: a necessary perception change for recognizing that water is also an economic good, the willingness of citizens to pay significantly for water, the capacity to pay especially for the urban and rural poor, and – last but not least - the institutional lay-out necessary for successful implementation (for instance, institution building, improving governmental capacity, decreasing conflicting governmental interventions, and making cost and collection systems transparent).

While the use of economic instruments have been argued for by (environmental and natural resource) economists as well as ecological modernizationists as a basic element to combat various water challenges, the Chinese experiences discussed in Chapter 3 showed that the use of economic instruments for dealing with water problems is a complicated process. It does not just imply changes in water tariffs, but also includes institutional reforms (which often prove crucial for solving urban water problems) in water regulation, monitoring system for collection systems, financial management, governmental subsidies, public participation, and social and equity issues. The in-depth analyses of empirical practices of urban water tariff reform in Guizhou Province over the past decades illustrated that the actual implementation of pricing policies in local urban water management is facing various challenges. Successful implementation requires a more and better professional staff; more advanced and uniform systems of monitoring and billing; improvement of accountability, transparency, and public participation in the policy-making and implementation; and further attention to policy integration.

Similar to the hotly debated economic instruments to address urban water challenges, private sector participation has been a second contested solution for urban water problems within global water debates during the past two decades. Arguably, private sector participation is an even more controversial topic in public utility management today, due to numerous failures and public resistance (cf. Hall et al., 2005). In China, the (central and local) government have paid significant attention to the further involvement of the private sector in public utility management, hoping that this approach can address several water problems (water shortage, insufficient infrastructure, water pollution, etc.) caused by accelerated urbanization and high economic growth. As illustrated in Chapter 4, various forms of private sector involvement have emerged and blossomed recently in China's urban water sector; and economic actors (such as private investors, water service providers, and consumers) have been of increasing importance and have shared responsibilities that were traditionally with governments (such as investment and financing, operation and management of service provision). However, the current private sector involvement in the Chinese water sector still faces many problems, especially with respect to legal and regulatory uncertainties (cf. the case analyses in Chapter 4, this thesis). Furthermore, the charge level of water service has an impact on the development of private sector participation. The specific analyses of Chapter 5 showed that the current low rate of wastewater treatment charge constraints private sector participation.

Although the early stage of public private partnership development prevents us from drawing any final conclusions on the impact of private sector involvement in the Chinese water sector, it is without doubt that the traditional structure of full governmental provision of water service has changed dramatically in China. Governments do no longer fully control the planning, operation and management of water services as they used to do. While the economic and pricing instruments are at an early stage of development in China's urban water sector, current attention is mainly directed at the economics of setting 'right' prices, and less to the institutional aspects that come along with implementation and governance. For a sustainable and successful economization of water service, further attention will have to be redirected to institutional and governance aspects.

In short, it is safe to conclude here that both the price policies and private sector participation approaches witness the increasing importance of economic and market dynamics in China's urban water sector.

(ii) *State-market relations in Chinese urban water governance*

In numerous theories in (environmental) sociology and economics, state organizations are seen as vital in safeguarding public goods and the environment from the destructive activities of self-interested producers and consumers, while the market is often considered to fail as a coordinating mechanism concerning the production of collective goods. As indicated in the theory of ecological modernization, two points put this view of state superpriority and market failure into a different perspective. First, the traditional bureaucratic state also fails to a considerable extent in adequately producing and safeguarding public goods (labeled as ‘state failure’). In order to effectively and successfully execute environmental policy in a complex modern industrialized society, the state has to reform its roles and strategy. Second, the market should not be excluded from the provision of collective goods, although it can never become the prime coordination mechanism with respect to safeguarding the environment (cf. Mol, 1995; Mol and Spaargaren, 2002).

In dealing with the environmental dimension (such as natural resource protection, infrastructure expansion, and pollution control) of the Chinese urban water sector, the Chinese state does indeed increasingly change its role in urban water governance through several innovations. First, there is an increasing separation of government and enterprise, government and utilities, and government and assets management [*Zhengqi Fenkai*, *Zhengshi Fenkai*, and *Zhengzi Fenkai*] following the reform of Chinese SOEs. This reform was firstly conducted in major production sectors since the start of Chinese economic reform in the late 1970s, but spread to urban water sectors in the 1990s and is still ongoing in this field today. Second, since the marketization reform and private sector involvement significantly spread to public utility sectors (such as water, wastewater, public transport, etc.) in 2002, the government emphasized its regulatory role in various aspects of water services provision⁶⁴, and attempted to create a balanced system (regarding benefit, power,

⁶⁴ For instance, following the call for concession management and private sector participation approaches in 2002, the MOC on August 30 of 2004 issued a specific policy paper, the *Opinions on Strengthening Operational Regulation of Municipal Wastewater Treatment Plants*, emphasizing to improve capacities of local authorities for regulating the operational performance of WWTPs which has been neglected before, and to change the governmental role from the traditional ‘sector manager’ to a ‘new regulator’. Later, on September 10 of 2005, the MOC reemphasized the importance of governmental regulatory role with *Opinions on Strengthening Regulation of Public Utilities* (No. 154 Policy Paper, the MOC, 2005), providing further detailed elaborations on scopes of regulation (cf. Fu and Zhong, 2005). This policy paper of the MOC is seen as a timely document to correct the neglect of governmental regulation in previous policy papers on private sector participation and marketization reform of public utility sectors. Furthermore, the SEPA has been active in discussing and

and responsibilities) between the government, the economic service provider (public, PPP, or private), and the civil society.

As could be concluded from Chapters 4 and 5, the central government has emphasized the changing of governmental roles and functions as a key to successful marketization reform in the fields of urban public utility sectors (also see Fu et al., 2006; World Bank, 2006a). The (local) governments are requested to withdraw from the traditional execution of water service provision, and to focus on their regulatory/control functions in the new governance structure of urban water sectors. However, the empirical practices in the case study cities and projects with private sector involvement (illustrated in Chapter 4) showed that the changing roles and functions of government as well as the establishment of a regulatory framework has not processed smoothly, due to various limitations such as inappropriate perceptions, insufficient capacities of (local) governments, and wrong priorities.

Nevertheless, the traditionally fully bureaucratic governmental management in Chinese urban water sector has been gradually replaced by a new governance structure where a (potential) market is being formulated for capital raising and financing, constructing infrastructure and facilities, and executing service provisions. In other words, a new state-market relation has been – and will be further – created for Chinese urban water governance in which the state's activities are reduced in fields such as financing, building, and operating, while the market is playing an increasingly role in these fields.

(iii) Roles of civil society in China's urban water governance

Compared to the Western democratic countries where social actors have acted as active advocates for the environment and played important roles in governmental planning and decision-making processes, Chinese political, economic and societal contexts provide a different habitat for environmental NGOs and social movements. Some scholars (such as Martens, 2007) have argued that the Chinese state is dominant in the public realm of environmental (inter)actions and Chinese citizens have little or no participation in

legislating on its regulatory role for WWTPs since the early 2004, while the conventional governmental wastewater utility company has reformed gradually as an independent enterprise and private sector participating in this field.

governmental decision-making processes. Nevertheless, numerous recent investigations show that environmental NGOs and civil society are becoming increasingly visible players in Chinese environmental politics and their (potential) influence on environmental policy and decision-making has increased (cf. Yang, 2005; Lu, 2007).

This thesis provides evidence of the increasing role of civil society in Chinese urban water governance. As argued in Chapter 6, the emergence and institutionalization of public hearings in water tariff setting marks a promising start of a larger public input in governmental decision-making, although it has a different outlook and performance from public hearings developed in Western countries.

To date, water pricing in China is still under governmental control, as state authorities have the final decision right on water tariff setting. However, from the experiences with price public hearings in recent years in China, as analyzed in Chapter 6, the power and influence of participants from various governmental departments, industries, organizations, and individual households go beyond mere symbolic tokenism or information reception. In the changing relations between state, market and civil society in the development of urban water sectors, where water supply companies become more independent and (economically) accountable and tariffs for water services are increasingly determined on economic grounds, the institution of public hearing in Chinese water tariff setting fulfills various functions: it balances a purely market economic motive and rationale in price settings now that the state role is reducing; it balances various interests - from state bureaucracies, water providers and private consumers - in price settings and tariff plans; it makes price increases more legitimized, acceptable and thus water companies also publicly accountable; and – last but not least – it forms an experiment and learning process with citizen participation in decision-making: for state agencies, for private organizations and for the public.

Although the actual impact of public hearings is still controversial and differs from city to city, this thesis would conclude here that the Chinese government is moving towards a trend of more open, transparent and accountable governance. This is also supported by other investigations on environmental NGOs and social movements in China. Besides the findings of this thesis, on the influences of civil society on governmental decision-making for water tariffs, other studies also indicate that environmental NGOs appear to make an

impact on government policy and practices in the field of water governance⁶⁵. The Institute of Public & Environmental Affairs, an environmental NGO in Beijing, began operating China's first public database of nationwide water pollution through an on-line China Water Pollution Map, which enables users to survey water quality, monitor pollution discharges, and track pollution sources⁶⁶.

7.3 Trends of Ecological Modernization in China

As mentioned in Chapter 2, a recent officially issued bilingual report – China Modernization Report 2007 (China Centre for Modernization Research, 2007) - has attempted to understand and interpret from an Ecological Modernization perspective the current environmental or ecological reform of China, especially emphasizing technological change and market reforms as the main powers driving environmental improvements. The report to a major extent neglected the importance of other elements (such as political innovations, subpolitics, reinvention of environmental governance, and roles of civil society and NGOs) which Ecological Modernization theory considers of major relevance for environmental reform. As Zhang et al. (2007) argue, this 2007 report provided an interpretation of a first stage of 'weak' ecological modernization (cf. Sonnenfeld and Mol, 2002; Christoff, 1996).

However, from this thesis, it should be concluded that the Chinese urban water sector provides evidences that contemporary China is witnessing at least experiments with a much wider ecological modernization agenda, where new forms of environmental governance (such as decentralization, the involvement of various non-state actors, further reform of state-market relations), a wider contribution of civil society and public participation, and attention to issues of equality and power distribution do play a role. As discussed in the empirical chapters in this thesis, four major features in China's urban water sector can be identified:

⁶⁵ For instance, in 2003, the media and environmental NGOs mobilized public opinion against a planned dam near Dujiangyan and dropped this plan eventually (Xie and Mol, 2006). In 2004, the construction of a hydropower station on Nujiang River was put on hold after a campaign led by environmental NGOs and media (cf. Lu, 2007).

⁶⁶ See <http://www.ipe.org.cn/index.jsp>.

- ✓ Rapid development of private sector involvement in water sector (see Chapter 4 and 5)
- ✓ Stronger separation of state and market (or of execution and regulation/control) (see Chapter 3, 4, and 5)
- ✓ Increasing water prices, with partial compensation for low income groups (see Chapter 3 and 6)
- ✓ Increasing participation in governance through public hearings, with varying results (see Chapter 6)

In addition to the institutional innovations for the urban water sector, similar changes can be found for other environmental issues. For instance, the public hearings approach is not only emerging and institutionalized for setting water tariffs, but is also applied in other aspects of environmental governance such as designing environmental regulations and environmental impact assessment processes. The roles, responsibilities, and influences of civil society and NGOs for environmental governance have been increasingly emphasized (cf. Xue, et al., 2007; Lu, 2007; Yang, 2005). Along with the general economic reforms of China, the role and functions of economic instruments and market dynamics show increasing importance in various fields of environmental protection. In the meanwhile, some recent studies emphasize the importance of institutional innovations for improving the efficiency and effectiveness of Chinese environmental governance. For instance, the recent report of the Task Force on Environmental Governance to the China Council for International Cooperation on Environment and Development (CCICED) proposed to elevate the administrative position and institutional status of SEPA to a full cabinet position in the government (cf. Xue et al., 2006).

In conclusion, China is moving towards a (potential) trend of ecological modernization, both in regular production sectors and in public utility sectors. It is too early to conclude whether this Ecological Modernization trend brings about a green road for China's development, or whether it is not really making an impact on China's one-dimensional economic development path. However, it can be argued that the theory of Ecological Modernization offers further ideas for the future environmental reform of China's development path.

7.4 Ecological Modernization Theory for State-in-Transition

This thesis can be seen as an attempt to use a Western style theory in a Chinese transitional context. While Ecological Modernization theory has been developed against the background of west-European societies, the starting premise in this thesis was that such Western environmental reform theories find increasing relevance outside its geography of origin. Environmental issues and reforms can no longer be regarded merely as local issues, as more and more global environmental problems (for instance, the climate change issue and transboundary river basin management) have emerged, forcing discussions and initiatives on (transnational or) global environmental governance. In the meanwhile, local environmental problems at different localities (such as resource scarcity and pollution) result from similar sources (e.g. rapid industrialization), although they take place in different political, economic and social contexts (either developed or developing), as well as take place in different times.

Thus, theories on environmental reform can and even have to move beyond nation-state territorial boundaries today. Currently, there is a strong debate whether the theory of Ecological Modernization is an (potential) analytical framework that meets the idea of global relevance. Most scholars agree that Ecological Modernization theory has successfully interpreted and understood the historical greening of production and consumption processes in developed or OECD countries, but its applicability in states-in-transition (developing vs. developed and centralized bureaucracy vs. free market) is heavily debated today. China is a particularly interesting case in this debate on the geographical relevance of Ecological Modernization theory, for at least two reasons:

1. China is of key relevance for the global environment, through its direct contribution to 'additions' and 'withdrawals', but also through its current and future role as an influential economic and political entity in the world, which will play a crucial role in global environmental governance.
2. China combines the two dimensions of transitional economies: the transformation of a developing to a developed economy, and the transformation from a centrally planned economy to one in which market dynamics play a much larger role.

The debate on the relevance of Ecological Modernization theory for China is for instance put forwards by Huan (2007). He recently criticized the Ecological Modernization inspired interpretations and optimistic views of two recent books *Environmental Governance in China* (Carter and Mol, 2006) and *China Shifts Gears: Automakers, Oil, Pollution, and Development* (Gallagher, 2006). In doing so he questions whether China can bring about its “economy’s greening through an increasing capable and flexible environmental state” (p.684) and argues “even if ecological modernization in its minimum standard is realizable, there is no guarantee that it will lead China to a sustainable future” (p.687).

Without any doubt one should be careful to transfer Western ideas, practices and institutional designs to other territorial areas with different political, economic and societal conditions. Local variables (including ideology, regime type, political culture, state-society relations, and scientific and institutional capacity) are major factors resulting in differences in transitions towards sustainability among states (cf. McBeath and Rosenberg, 2006). Within previous studies of Ecological Modernization in transitional and developing counties, most scholars apply this theory in a loose way to assess the dynamics of environmental reforms in that geography. Following a similar line, the empirical practices in previous chapters, on the one hand, witness some innovations in China’s environmental governance (particularly in the field of urban water governance), which are comparable to Western style ecological modernization ideas, practices and institutional innovations. Many core concepts and ideas of the theory of Ecological Modernization can be found useful here, such as economizing the ecology, the ecologizing of the economy, a shift from command-and-control regulation to (participatory) environmental governance, the involvement of the private sector and increasing role of economic actors, improvement of environmental policy integration, and an increasing role and involvement of civil society. On the other hand, in analysing environmental reforms in the Chinese urban water sector this thesis has also shown differences from Western style ecological modernization due to the different economic, political and societal/cultural variables in China. This marks the need for specifying where western style ecological modernization differs from what we can expect in states-in-transition. Three dimensions deserve mentioning.

(i) *Economic dimension: market economy vs. incomplete market economy*

As argued in the rich literature of neo-Marxist, deindustrialization and counter-productivity scholars, capitalism and industrialization are often seen as fundamental causes of the environmental crisis. This has resulted – at least in developed countries – to a steady stream of scholars arguing for a dismantling of large-scale industrial systems and the capitalist economy. These ideas of anti-technology, anti-industrialization and anti-capitalism do emerge also in developing countries but have a slightly different twist. Often industrialization and a capitalist market economy by themselves do not meet such massive rejection as happened in the OECD countries in the 1970s; and if these institutions are criticized it is rather related to unequal development and less so for environmental reasons. This makes that, although the institutional preconditions for an Ecological Modernization strategy might not always be favorable in developing countries, criticism against such strategies for solving environmental problems and setting out an ecological reform path are often less pertinent.

But the practical implication of involving market actors and market dynamics in environmental reform in transitional economies might be more complicated, as has become evident in the current research on China. As illustrated by the Chinese experiences of introducing pricing instruments as well as private sector participation in the urban water sector (see the previous empirical chapters), these economic actors and mechanisms are relevant in environmental reform. However, the incomplete market economy of states-in-transition will bring about challenges to western-style Ecological Modernization theory. In contemporary China, economic rationalities are not self-evidently prevailing in valuing water but have to be actively introduced by state policies. Nor is the full range of economic actors active in environmental reforms (such as banks, insurance companies, credit institutions, and consumers). Thus, while the economic dimension of environmental reform (as theorized upon by Ecological modernization theory) is prevalent in China, it has a different relevance and dynamic.

(ii) *Political modernization: democratic vs. semi-authoritarian states*

Western style ecological modernization experiences have witnessed changes in the roles and functions of state and non-state actors in environmental governance. But these

transformations in environmental governance are often highly related to the specific context of a democratic political regime, where the state is (relatively) open, transparent and accountable to the public and civil society is used to participate in and impacting on governmental decision-makings.

Within the Chinese semi-authoritarian political regime, ideas of democracy are to some extent reflected such as the importance of the People's Congress at various levels, the development of village democracy, the changing perception of citizenship, the development of mechanisms of accountability and transparency, and the sprouts and development of civil society (cf. Martens, 2006; Ho, 2007). On the whole, however, these forms of 'democracy' are still quite different from the Western understanding of democratic governance. As demonstrated in the previous chapter, the Chinese state has attempted to or is attempting to adopt participative approaches for improving its decision-making processes without fundamentally changing its political structure and processes (for instance, the institutionalization of public hearings for water tariff setting). No matter how welcome, these and other current practices of participation are still controversial within China and much room for improvement remains from a western democracy and participation point-of-view. However, this kind of moderate transformation is obviously an accepted way for the state to shift to more open and accountable forms of environmental governance, due to its limited risk of social instability.

In addition, optimists believe that some external (international) forces (such as the international pressures and relatively free information delivery in the information age) may have a major impact on pushing semi-authoritarian states to change its conventional centralized bureaucratic mode of governance, resulting in harmonization in tendencies of political modernization. That might be the case; but there are also contradictory scenarios possible. The safest conclusion for the moment would be that, while we currently do not witness similar political modernization processes in China as those theorized upon in West-European-based Ecological Modernization theory, this does not mean that the notion of political modernization is not relevant in political regimes without a fully open, transparent and accountable state. The notion of political modernization does help us to identify important changes in modes of environmental reform, without claiming that China has similar political modernization processes as west-European countries.

(iii) Civil Society: strong vs. weak social movements

The theory of Ecological Modernization emphasizes the importance of the involvement of civil society and the significance of social movements in environmental reforms. From the history of greening societies in Western countries, environmental NGOs and social movements have become known as a crucial force in pushing environmental reforms.

Chinese environmental NGOs have only recently emerged. These NGOs, but also less organized parts of civil society that want to become – and do get - engaged with environmental issues, are functioning in a different habitat, where they rely heavily on the party-state (often taking the form of GONGOs), and have a relative weak impact on governmental decision-making compared to their equivalents in Western countries. From the discussions on the actual impact of public hearings on governmental decision-making for water tariffs in Chapter 6, it could be concluded that these experiments in civil society participation is interesting, but that the actual impact on governmental decisions is still limited. Similar conclusions emerge from other publications on civil society and NGOs in relation to environmental governance in China. Although the current civil society (or social movement) is still quite weak in the field of environmental governance, some hopeful signs towards more participative environmental governance have been witnessed in China. So, whereas western Ecological Modernization theory emphasizes *changes* in the strategy, ideology and positions of environmental NGOs and civil society, in China the emphasis is very much on the *emergence* and starting role of these sectors in environmental governance.

In brief, this thesis concludes that the theory of Ecological Modernization is also relevant and helpful for understanding and interpreting the institutional changes in environmental reform that emerge under the conditions of state-in-transition. However, the variations and differences in environmental reform dynamics may require the development of a special modified version of Ecological Modernization theory. But that should be one that fully takes into account that such environmental reforms are not limited to only the economic and technological dimensions.

7.5 Implications for Future Research

Different from the current technological and economic research concerning water issues, this thesis has specified and evaluated (three) institutional innovations of Chinese urban water sector from an (environmental) sociological perspective, in which the roles and relations between the state, economic actors, and civil society have been emphasized. Given the fact that China is still facing many challenges of water management such as the current fragmented management of water flows, interest conflicts among various governmental agencies, incapacity of government, and inadequate accountability and transparency of governmental decision-making, it is obvious that this thesis can only be seen as one brick in building a wall of understanding Chinese (urban) water governance. There are at least three interesting directions for further research.

(i) Further reforms to greening China's (urban) water governance

Specifically, this thesis has contributed to understand the current institutional changes of Chinese urban water sector and identified major challenges and problems existing in current governance structures and arrangements. For instance, Chapter 3 showed a need in institutional changes for implementing pricing policies; Chapter 4 and 5 illustrated the great institutional challenges for further private sector involvement in water service provision, in particular the building of a legal framework and the establishment of an effective regulatory framework; and Chapter 6 emphasized the room for improving public participation in governmental decision-making processes.

Furthermore, three recent influencing research reports on Chinese environmental challenges issued by the World Bank (2007), OECD (2007), and CCICEDC (Xue et al., 2006), respectively, have enjoyed large (international and domestic) media and public attention. All three reports have emphasized the importance of institutional changes for China's environmental governance, in which water and air are hotly debated issues. They also proposed to strengthen further research on the institutional dimensions of Chinese environmental governance. There indeed remains much room for further investigations in this field.

(ii) Environmental reforms in other public sectors

This thesis deals with the Chinese environmental governance regarding the urban water sector. It would be highly interesting to investigate the institutional dynamics of environmental reform in other public utility sectors, such as transport, energy and waste, and to compare these with the findings of this thesis. This could not only generate ideas for new innovations in environmental reform in the urban water sector, but also qualify and assess the various Ecological Modernization's dynamics that are – or are not – taking place in China, contributing to scientific insights into the wider relevance of this theory

(iii) Chinese Ecological Modernization theory?

Finally, following our analysis in the former section, it would be interesting to further work upon a theory of environmental reform in the typical context of transitional China. Ecological Modernization theory – as it has been formulated for west-European countries – can be a helpful starting point and we might turn up with a Chinese style Ecological Modernization theory, as for instance the China Centre for Modernization research (2007) has done. But much more integration of various theories (on transitional economies, on Chinese politics, on Chinese culture etc.) and empirical studies on Chinese environmental reform is needed for reaching such a conclusion.

References

- ADB, 2005. *Final Report on Major Issues and Recommendations of PPP in the Water Sector in China*, ADB TA-4095: PRC/Policy Reform Support, available online at:
<http://www.adb.org/Documents/Reports/PRC-PPP-Water/TA4095-Final.pdf>
- Afonso A., L. Schuknecht, and V. Tanzi, 2005. Public sector efficiency: An international comparison. *Public Choice*, 123: p.321-347.
- Andersen, M. S., and I. Massa, 2000. Ecological modernisation: Origins, dilemmas, and future directions, *Journal of Environmental Policy and Planning*, 2, 337-345.
- Andersen, M.S., 1994. *Governance by Green Taxes: Making Pollution Prevention Pay*, Manchester University Press: UK
- Anwandter, L., and T. Jr.Ozuna, 2002. Can public sector reforms improve the efficiency of public water utilities? *Environment and Development Economics*, 7: p.687-700.
- Arnstein, Sherry R., 1969. A Ladder of Citizen Participation. *Journal of the American Institute of Planners* 35(3): 216-24.
- Arts, B., and P. Leroy, 2006. *Institutional Dynamics in Environmental Governance*, The Netherlands: Springer.
- Beck, U., 1986. *Risikogesellschaft. Auf dem Weg in eine andere Moderne*, Frankfurt: Suhrkamp
- Beck, U., 1992. *Risk Society: Toward a New Modernity*, London: Sage.
- Beck, U., 1994. The reinvention of politics: Towards a theory of reflexive modernization, in: U. Beck, A. Giddens, and S. Lash (eds.), *Reflexive Modernization, Politics, Tradition and Aesthetics in the Modern Social Order*, (pp.1-55), Cambridge: Polity Press
- Beijing Xinhua, 2004. Water tariff: closely linked to Beijing residents. June 3, 2004. In:
http://www.bj.xinhuanet.com/bjpd_sdzx/2004-06/03/content_2245647.htm (in Chinese).
- BeijingNews [*Xin Jing Bao*], 2004. Beijing is organizing a public hearing for new water tariff. June 3, 2004. In: <http://www.h2o-china.com/news/22795.html> (in Chinese).
- Birchall, J., 2002. Mutual, non-profit or public interest company? An evaluation of options for the ownership and control of water utilities. *Annals of Public and Cooperative Economics*, 73:2, p.181-213.
- Blahna, D.J., and S. Yonts-Shepard, 1989. Public involvement in resources planning: Toward bridging the gap between policy and implementation. *Society and Natural Resources* 2:209-227.

- Boland, J. J., 1997. *Pricing urban water: Principles and compromise*, Paper presented at the World Bank seminar on Pricing of Sanitation and Water Services, February 18-19, 1997.
- Boubakri, N., and J.C. Cosset, 1998. Privatization in Developing Countries. In: *Public Policy for the Privatesector*, Note No.156, November 1998: the World Bank.
- Burch, W.R., Jr., 1976. Who participates – a sociological interpretation of natural resource decision. *Natural Resources Journal* 16:41-54.
- Carter, N.T., and A.P.J. Mol, (eds.), 2007. *Environmental Governance in China*, London: Routledge
- Chang, M., T. FU, and L.J. Zhong. 2006. Policy-based finance and urban water sector reform, *China Water& Wastewater*, vol.22, No.10, pp.77-80, (in Chinese).
- Changsha Evening Paper [*Changsha Wanbao*], 2006. Changsha Price Bureau announced the list of representatives for the public hearing of wastewater treatment charge, November 28, 2006. In: <http://www.h2o-china.com/news/44108.html>.
- Checkoway, B., 1981. The politics of public hearing. *Journal of Applied Behavioural Science* 1981, 17(4), 566-583.
- Checkoway, B., and J. van Til, 1980. *What do we know about citizen participation? A selective review of research*. In S. Langton, (eds.), Mass.: Lexington Books, 1974.
- Chen, A.J., 2007. An analysis of stakeholders in water pollution events, in *Proceeding of 2007 Beijing International Conference on Environmental Sociology*, June 29 – July 1, 2007, Beijing.
- Chen, Y.M., 2005. *An administrative reconsideration case and the effectiveness of the State Council policy documents*, at: <http://www.chinalaw.gov.cn> (in Chinese).
- China Centre for Modernization Research, 2007. *China Modernization Report 2007: Study on Ecological Modernization*, Beijing: Beijing University Press.
- Chinese Economic Times, 2006. *Dahua: Collection of water resource fee encountering policy problems*, January 11 of 2006), at: <http://hwcc.com.cn/newsdisplay/newsdisplay.asp?Id=143070>, (in Chinese).
- Chongqing Evening News [*Chongqing Wanbao*], 2005. Fengdu Chongqing: Water tariff increased in spite of the rejection from price public hearing. November 24, 2005. In: <http://www.h2o-china.com/news/34350.html>, (in Chinese).
- Choy, Er ah, 2007. *A Quantitative Methodology to Test Ecological Modernization Theory in the Malaysian Context*, Wageningen: Wageningen University (PhD thesis).
- Christoff, P., 1996. Ecological modernisation, ecological modernities, *Environmental Politics*, 5:476-500.

- Cohen, M., 1997. Risk society and Ecological Modernization: Alternative visions for post-industrial nations, *Future*, vol.29, No.2, pp.105-119.
- Cole R.L., and D.A., Caputo, 1984. The public hearing as an effective citizen participation mechanism: A case study of the general revenue sharing program. *The American Political Science Review* vol.78, No.2 (June 1984): 404-416.
- Conca, K., 2006. *Governing Water: Contentious Transnational Politics and Global Institution Building*, London: MIT Press.
- Cortner, H., 1996. Public involvement and interaction. Pages 166-179 in A.W. Ewert (eds), *Natural resource management: The human dimension*. Westview Press, Boulder: Colorado.
- Creswell, J.W., 1994. *Research Design: Qualitative and Quantitative Approaches*, Thousand Oaks, London, New Delhi: Sage.
- Dahe News [*Da He Bao*], 2003. Consumer Association query the public hearing. Aug 6, 2003. In: www.hbby.com.cn (in Chinese).
- Davies, A.R., 2002. Power, politics and networks: shaping partnerships for sustainable communities, *Area* vol. 34, no. 2, pp.190-203
- Du, B., 2006. *Analysis of Industrial Water Conservation Potential and Technology Selection in China*, Beijing: Tsinghua University (PhD thesis, in Chinese).
- Dunlap, R.E., and B.K. Marshall, 2007. Environmental Sociology, in: Bryant, C.D., and D.L. Peck, (eds.), *21st Century Sociology: A Reference Handbook*, Vol.2, (pp.329-40), Thousands Oaks, CA: Sage.
- Environmental Politics*, 2006. Special Issue on *Environmental Governance in China*, vol.15.
- Fenwick, J., 1989, Consumerism and local government, *Local Government Policy Making* 16, 1(June):45-52.
- Fenwick, J., and S. Snape, 1996. Closer to the customer? Local government and international experience, *Public Policy and Administration* 11, 4(Winter):45-55.
- Figuères, C.M., C. Tortajada, and J. Rockström, (eds.), 2003. *Rethinking Water Management: Innovative Approaches to Contemporary Issues*, UK and USA: Earthscan Publications Ltd.
- Finger, M., and J. Allouche, 2002. The Transformation of the Global Water Sector: the Role of the World Bank and 'Public Service TNCs'. *Working paper de l'IDHEAP*, No.6, April 2002.
- Fiorino, D.J., 1990. Citizen participation and environmental risk: A survey of institutional mechanisms, *Science, Technology, & Human Value*, vol. 15, No.2. (Spring, 1990), pp.226-243.
- Fisher, D.A., and W.R. Freudenburg, 2001. Ecological Modernization and its critics: Assessing the past and looking toward the future, *Society and Natural Resource*, vol.14, pp.701-709.

- Flyvbjerg, B., 2004. Five misunderstandings about case-study research, In: Seale, C., G. Gobo, J.F. Gubrium, and D.Silverman (eds.), *Qualitative Research Practices*, pp.420-434, Thousand Oaks: Sage Publication.
- Frijns, J., et al., 1997. *Pollution Control of Small Scale Metal Industries in Nairobi*, WAU/HABRI (Wageningen/Nairobi).
- Fu, T., and L.J. Zhong, 2005. Commentary: the MOC *Opinions on Strengthening Regulation of Public Utilities*, October 25 of 2005, at: www.h2o-china.com, (in Chinese).
- Fu, T., L.J. Zhong, and M. Chang, 2005. Case studies and recommendation of concession management in water sector, in Fu, T., J.N. Chen, L.J. Zhong, et al, *Twelve Key Issues of Urban Water Sector Reform*, Beijing: China Architecture & Building Press (in Chinese).
- Fu, T., M. Chang, and L.J. Zhong, 2006. *Chinese Urban Water Sector Reform: Empirical Experience and Case Studies*, Beijing: China Architecture & Building Press (in Chinese).
- Gallagher, K.S., 2006. *China Shifts Gears: Automakers, Oil, Pollution, and Development*, Cambridge, MA: MIT Press.
- General Office of the MOC, Survey Report on the Cost of Water Supply Companies of Key Cities between 1999 and 2003, *Investigation, Research and Information*, No.13, March 25 of 2005 (in Chinese).
- General Office of the State Council, 2004. *Circular on Accelerating Water Tariff Reform, Promoting Water Saving and Protecting Water Resource*, No.36 policy paper (in Chinese).
- Giddens, A., 1984. *The Constitution of Society*, Cambridge: Polity Press.
- Giddens, A., 1990. *The Consequences of Modernity*, Cambridge: Polity Press.
- Giddens, A., 1998. *The Third Way*, Cambridge: Polity Press.
- Glaser, B., and A., Strauss, 1967. *Discovery of Grounded Theory*, Chicago: Aldine.
- Gopalakrishnan, C., 2005. Water allocation and management in Hawaii: A case of institutional entropy, in: Gopalakrishnan C., Tortajada C., and Biswas, A.K., (eds.) *Water Institutions: Policies, Performance and Prospects*, Berlin: Springer, pp.1-23.
- Graw, K.U., and E. Maggio, 2000. The public-private-partnership approach: a solution for water distribution and wastewater drainage in megacities. In: Maione, Majone Lehto & Monti (eds) *New Trends in Water and Environmental Engineering for Safety and Life*, Balkema: Rotterdam.
- Guangzhou Daily [*Guangzhou Ribao*], 2005. Shenzhen: Hearing for adjusting wastewater treatment charge, March 25, 2005. In: <http://www.h2o-china.com/news/28796.html> (in Chinese).

- Guislain, R., and M. Kerf, 1995. Concessions – The Way to Privatize Infrastructure Sector Monopolies, in: *Public Policy for the Privatesector*, Note No.59, October 1995: the World Bank.
- Guizhou Daily [*Guizhou Ribao*], 2006. Water tariff could be decided by the masses. April 11, 2006. In: <http://www.h2o-china.com/news/38085.html> (in Chinese).
- Guizhou Price Bureau, 1998. First Price Public Hearing in Guizhou Province, *Guizhou Price Information*, vol. 22, 1998, (in Chinese).
- Guizhou Price Bureau, 2004. *Review of Guizhou Water Tariff Reform* (in Chinese).
- Guo, Y.S., and W. Zhao, 1999. Administration system and legal institutions of water resources in China, in *Proceedings of the Sino-Dutch Seminar on Water Management*, April 13-14, 1999, Beijing (in Chinese).
- Gyford, J., 1991. *Citizens, Consumers and Councils*, London: Macmillan.
- Hajer, M.A., 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*, Oxford: Clarendon.
- Hall, A.W., 2007. Global experience on governance, in: Truton, A.R., H.J. Hattingh, et al., (eds.) *Governance as A Trialogue: Government-Society-Science in Transition*, Berlin: Springer, pp.29-38.
- Hall, D., and E. Lobina, 2005. The relative efficiency of public and private sector water, Report commissioned by Public Services International (PSI), at: www.world-psi.org, September 2005.
- Hall, D., E. Lobina, and R. de la Motte, 2005. Public resistance to privatization in water and energy, *Development in Practice*, vol. 15, No.3&4, June 2005.
- Halvorsen, K.E., 2001. Assessing public participation techniques for comfort, convenience, satisfaction, and deliberation. *Environmental Management*, Vol.28, No.2:179-186.
- Han, J.Y., 2006. *Environmental Auditing and Renewable Energy Policies in China*, PhD research proposal, Wageningen University.
- Hancock, T., 1998. Caveat partner: reflections on partnership with the private sector, *Health Promotion International* vol. 13, no. 3, pp.193-195
- Hannigan, J., 2006. *Environmental Sociology*, second edition, USA and Canada: Routledge.
- Hart, O., 2003. Incomplete contracts and public ownership: Remarks, and an application to public-private partnerships. *The Economic Journal*, 113 (March): p.C69-C76.
- He, J.Y., and R.H. Wu, 2001. Theory of ecological modernization and current environmental decision-making of China, *Journal of Chinese Population, Resources and Environment*, Issue 4 of 2001, Jinan (in Chinese).

- Heberlein, T.A., 1976. Some observations on alternative mechanisms for public involvement. *Natural Resources Journal*. 16:197-212.
- Ho, P., 2007. Embedded activism and political change in a semiauthoritarian context, *China Information*, vol.XXI (2), pp.187-209.
- Huan, Q.Z., 2007. Ecological Modernization: A realistic green road for China? *Environmental Politics*, vol.16, No.4, pp.683-687.
- Huang, Y.N., and P. Ye, 2001. A Review on the Ecological Modernization theory in Western Countries, *Foreign Social Science*, 2001 (4):1-6, (in Chinese).
- Huber, J., 1982. *Die verlorene Unschuld der Ökologie: Neue Technologien und superindustrielle Entwicklung*. Frankfurt am Main: Fisher.
- Huber, J., 1985. *Die Regenbogengesellschaft. Ökologie und Sozialpolitik (The Rainbow Society, Ecology and Social Policy)*, Frankfurt am Main: Fisher.
- Izaguine, A.K., and C. Hunt, 2005. "Private Water Projects", in *Note of Public Policy for the Private Sector* by the World Bank Group, No.297, July 2005.
- Jänicke, M., 1986. *Staatsversagen. Die Ohnmacht der Politik in die Industriegesellschaft*, München: Piper
- Jänicke, M., 1991. *The Political System's Capacity for Environmental Policy*, Berlin: Department of Environmental Politics, Free University Berlin.
- Khoa, Le Van, 2006. *Greening Small and Medium-sized Enterprises; Evaluating Environmental Policy in Viet Nam*, Wageningen: Wageningen University (PhD thesis).
- Kikeri, S., and A. Kolo, 2006. Privatization Trends, *Note of Public Policy for the Private Sector*, the World Bank Group, No.303, February 2006.
- Kim, H.Y., 1995. Marginal cost and second-best pricing for water services, *Review of Industrial Organization*, 1995 (10): 323-338.
- King, C.S., K.M. Feltey, and B.O. Susel, 1998. The Question of Participation: Toward Authentic Public Participation in Public Administration. *Public Administration Review* 58(4): 317-26.
- Lauber, B.T., and B.A. Knuth, 1998. Refining our vision of citizen participation: Lessons from a moose reintroduction proposal. *Society and Natural Resources*, 11:411-424.
- Leroy, P., and J. van Tatenhove, 2000. Political modernization theory and environmental politics, in: Spaargaren, Mol, and Buttel (eds.), *Environment and Global Modernity*, London: Sage Studies in International Sociology, pp.187-208.
- Linder, S.H., 1999. Coming to Terms With the Public-Private Partnership. A Grammar of Multiple Meanings, *The American Behavioural Scientist* vol. 43, no. 1, pp.35-51

- Liu, C.M., X.W. He, and H.Z. Ren, (eds.), 1996. *China Water Problems Study*, Beijing: China Meteorological Press (in Chinese).
- Liu, M.Y., 2004. *Chinese Hearing Procedure Study*. Beijing: China Legislation Press (in Chinese).
- Liu, W., 2004. *Economic Analysis of Chinese Water Institutions*, Shanghai: People Press (in Chinese).
- Liu, W.P., G.X. Wang, E.H. Guan, G.B. Jiang, and X. Chen, 2003. A survey on collecting and managing water resource fee, *China Water Resource*, 2003 (5) (in Chinese).
- Liu, Y., 2005. *Phosphorous Flows in China. Physical Profiles and Environmental Regulation*, Wageningen: Wageningen University (PhD thesis).
- Lobina, E., and D. Hall, 2000. Public Sector Alternatives to Water Supply and Sewerage Privatization: Case Studies. *Water Resource Development*, Vol.16, No.1, 2000:35-55.
- Lowndes, V., L. Pratchett, and G. Stoker, 2001a, Trends in public participation: Part 1 – Local Government perspectives, *Public Administration*, 79(2):205-22.
- Lowndes, V., L. Pratchett, and G. Stoker, 2001b, Trends in public participation: Part 2 – Citizens' perspectives, *Public Administration*, 79(2):445-55.
- Lu, Y.Y., 2007. Environmental civil society and governance in China, *International Journal of Environmental Studies*, vol.64, No.1, February 2007, pp.59-69.
- Lu, Y.L., 2007. The institutional support for building a water-conserving society, in *Proceeding of 2007 Beijing International Conference on Environmental Sociology*, June 29 – July 1, 2007, Beijing.
- Ma, J., 2004. *China's Water Crisis*, USA: Eastbridge.
- Martens, S., 2006. Public participation with Chinese characteristics: Citizen consumers in China's environmental management, *Environmental Politics*, vol.15, No.2, pp.211-230.
- McBeath, J., and J. Rosenberg, 2006. *Comparative Environmental Politics*, Netherlands: Springer.
- Miraftab, F., 2004. Public-Private Partnerships. The Trojan Horse of Neoliberal Development? *Journal of Planning Education and Research* vol. 24, pp. 89-101.
- MOC, 2001. *Survey and Assessment Report on the Home Equipment of Urban Wastewater Treatment*, Ministry of Construction, Beijing, China (in Chinese).
- MOC, 2005a. *Notice on the Status Quo of National Urban Wastewater Treatment*, September 7, 2005 (in Chinese).
- MOC, 2005b. *Statistical Yearbook of Chinese Urban Construction of 2004*, Beijing: China Architecture & Building Press (in Chinese).
- Mol, A.P.J., 1995. *The Refinement of Production: Ecological Modernization Theory and the Chemical Industry*, Utrecht: International Books (PhD thesis)

- Mol, A.P.J., 2000. The environmental movement in an era of Ecological Modernization, *Geoforum*, 31 (2000), pp.45-56.
- Mol, A.P.J., 2001. *Globalization and Environmental Reform: The Ecological Modernization of the Global Economy*, London: The MIT Press
- Mol, A.P.J., 2002. Political Modernisation and Environmental Governance: between Delinking and Linking, *EUROPAEA, Journal of the Europeanists*, vol. 8, no. 1-2, pp.169-186
- Mol, A.P.J., 2006a. Environmental governance in the information age: The emergence of informational governance, *Environmental and Planning C: Government and Policy*, 2006, vol.24, pp.497-514.
- Mol, A.P.J., 2006b. Environment and modernity in transitional China: Frontiers of ecological modernisation, *Development and Change*, 37 (1): 29-56.
- Mol, A.P.J., and D.A. Sonnenfeld, (eds.), 2000. *Ecological Modernization Around the World: Perspectives and Critical Debates*, London: Frank Cass.
- Mol, A.P.J., and D.A. Sonnenfeld, 2000. Ecological Modernization around the world: An introduction, *Environmental Politics*, 9 (2000), vol.1, pp.3-15.
- Mol, A.P.J., and F.H. Buttel, 2002. The environmental state under pressure: An introduction, in: Mol and Buttel, (eds.) *The Environmental State under Pressure*, Amsterdam: Elsevier Science Ltd., pp.1-11.
- Mol, A.P.J., and G. Spaargaren, 2000. Ecological Modernization Theory in Debate: A Review, *Environmental Politics*, 9 (2000) 1: pp17-50.
- Mol, A.P.J., and G. Spaargaren, 2002. Ecological Modernization and the environmental state, in: Mol and Buttel, (eds.) *The Environmental State Under Pressure*, Amsterdam: Elsevier Science Ltd., pp.33-52.
- Mol, A.P.J., and G. Spaargaren, 2005. From additions and withdrawals to environmental flows: Reframing debates in the environmental social science, *Organization Environment* 2005; 18; pp.91-106.
- Mol, A.P.J., and L.J. Zhong, 2007. Modernizing China's urban water sector: A case of ecological modernization? In *Proceeding of 2007 Beijing International Conference on Environmental Sociology*, June 29 – July 1, 2007, Beijing.
- Mol, A.P.J., and S. van den Burg, 2004. Local governance of environmental flows in global modernity, *Local Environment*, vol.9, No.4, pp.317-324.

- Mol, A.P.J., forthcoming. Bringing the environmental state back in: partnerships in perspective. In Gasbergen P., F. Biermann and A.P.J. Mol (eds.), *Partnerships, governance and sustainable development*, Edward Elgar
- MOWR, 2005. Water Conservancy Statistics Yearbook 2005, In: http://www.chinawater.net.cn/cwsnet/CWSArticle_View.asp?CWSNewsID=26851 (in Chinese).
- Murphy, J., and A. Gouldson, 2000. Environmental policy and industrial innovation: Integrating environment and economy through ecological modernization, *Geoforum* 31(1):pp.33-44.
- My Dieu, Tran Thi, 2003. *Greening Food Processing Industry in Vietnam. Putting Industrial Ecology to Work*, Wageningen: Wageningen University (PhD thesis).
- Nanfang City News [*Nanfang Dushi Bao*], 2005. Zhuhai intending to increase the water price by 37%, September 5, 2005. In: <http://www.h2o-china.com/news/32378.html> (in Chinese).
- Nanguo Morning News [*Nanguo Zaobao*], 2005. Nanning City increasing the water price, November 2, 2005. In: <http://www.h2o-china.com/news/33746.html> (in Chinese).
- NDRC, and MOC, 2003. *Survey Report on the industrializations and martetization of wastewater treatment and MSW Disposal*, Beijing, China (in Chinese).
- Nguyen Phuc Quoc, 1999. *Industrial Solid Waste Prevention and Reduction: Circular Metabolism in Rubber Products and Footwear Manufacturing Industries*, Wageningen: Wageningen University (MSc thesis).
- Nickson, A., 1996. *Urban Water Supply: Sector Review*, University of Birmingham: School of Public Policy, Paper in the role of Government in Adjusting Economies, No.7, January.
- Nickson, A., 1998. *Organizational structure and performance in urban water supply: the case of the SAGUAPAC cooperative in Santa Cruz, Bolivia* Paper presented at 3rd CLAD Inter-American Conference, Madrid, 14-17 October.
- Nickson, A., and C. Vargas, 2002. The limitations of water regulation: The failure of the Cochabamba Concession in Bolivia, *Bulletin of Latin American Research*, vol.21, No.1, pp.99-120.
- Ningbo Daily [*Ningbo Ribao*], 2006. Ningbo Zhejiang: Citizens discussing how to adjust the water tariff. May 18, 2006. In: <http://www.h2o-china.com/> (in Chinese).
- North, D.C., 1989. Institutions and economic growth: An historical introduction, *World Development*, vol.17, No.9, pp.1319-1332.
- Nuijten, M., 2004. Governance in action: Some theoretical and practical reflections on a key concept, in Kalb, D., and Pansters, W. (eds.), *Globalization and Development: Themes and Concepts in Current Research*, Kluwer Academic Publishers.
- OECD, 1997. Pricing of water services.

- OECD, 1999. Pricing of water services: An update.
- OECD, 2003. Public sector modernization, *Policy Brief*, October 2003.
- OECD, 2004a. Public sector modernization: Modernizing public employment, *Policy Brief*, July 2004.
- OECD, 2004b. Public sector modernization: Changing organizational structures, *Policy Brief*, September 2004.
- OECD, 2004c. Public sector modernization: Governing for performance, *Policy Brief*, October 2004.
- OECD, 2005a. Public sector modernization: Open government, *Policy Brief*, February 2005.
- OECD, 2005b. Public sector modernization: Modernizing accountability and control, *Policy Brief*, April 2005.
- OECD, 2007. *OECD Environmental Performance Reviews: China*.
- Oppenheim, J., and T. MacGregor, 2004. *Democracy and public-private partnerships*, International Labour Office
- Ostrom, E., 1986. An agenda for the study of institutions, *Public Choice*, 48 (1986): pp.3-25.
- Outlook Weekly, 2007. *The Annual Environmental Loss in China Reaching 10% GDP*, March of 2007. In: <http://h2o-china.com/news/46774.html> (in Chinese) .
- Phuong, Phung Thuy, 2002. *Ecological Modernisation of Industrial Estates in Viet Nam*, Wageningen: Wageningen University (PhD thesis).
- Poncelet, E.C., 2001. A Kiss here and A kiss There: Conflict and Collaboration in Environmental Partnership, *Environmental Management* 27, 1, pp13-25.
- Pongsiri, N., 2002. Regulation and public-private partnerships, *The International Journal of Public Sector Management*, Vol.15. No.6, 2002:487-495.
- Postel, S., 1993. Facing water scarcity, in: Brown L. (eds.) *The State of the World*, New York: W.W. Norton.
- Prasad, N., 2006. Privatization results: Private sector participation in water services after 15 years, *Development Policy Review*, 2006, 24(6):669-692.
- Putnam, R.D., 1995. Bowling Alone: America's Declining Social Capital. *Journal of Democracy* 6(1): 65-78.
- Qidong News Center, 2004. Views on Qidong public hearing for water tariff. July 25, 2004. In: <http://www.h2o-china.com/news/23888.html> (in Chinese).
- Qidong News Center, 2005. Public hearing is organized for new water tariff in Qidong, Jiangsu. May 23, 2005. In: <http://www.h2o-china.com/news/30064.html> (in Chinese).
- Qing, Y., 2001. *Introduction of Chinese urban water supply prices and wastewater treatment charges*, speech on the Sino-Denmark workshop on urban water supply price and wastewater treatment

- charges, Beijing, 5 July 2001. In: <http://www.cin.gov.cn/indus/speech/2001072303.htm> (in Chinese).
- REC (Regional Environmental Center for Central and Eastern Europe), 2001. *Environmental Taxes in an Enlarged Europe: An Analysis and Database of Environmental Taxes and Charges in Central and Eastern Europe*, Hungary: The Regional Environmental Center for Central and Eastern Europe.
- Rees, J.A., 1998. Regulation and private participation in the water and sanitation sector, *Natural Resource Forum*, vol.22, No.2, pp.95-105.
- Renzetti, S., 1992. Evaluating the welfare effects of reforming municipal water prices, *Journal of Environmental Economics and Management* 22, 147-163.
- Renzetti, S., 1999. Municipal water supply and sewage treatment: Costs, prices, and distortions, *The Canadian Journal of Economics*, Vol. 32, No.3 (May 1999): 688-704.
- Rhodes, R.A.W., 1987. Developing the public service orientation: or let's add a soupcon of political theory, *Local Government Studies*, May/June: 66-73.
- Richard, S., and B. Johnston, 2005. A Joined-up Approach to User Participation in Public Services: Strengthening the "Participation Chain", *Social Policy & Administration*, 39(3):260-283.
- Robison, R., and K. Hewison, 2005. Introduction: East Asia and the Trials of Neo-Liberalism, *Journal of Development Studies*, 41 (2):183-196.
- Robson, C., 2002. *Real World Research: A Resource for Social Scientists and Practitioner-Researcher* (2nd edition), Oxford: Blackwell.
- Rogers, P., and A.W. Hall, 2003. *Effective Water Governance*, No.7 TEC background paper, Sweden: Global Water Partnership.
- Rogers, P., R. de Silva, and R. Bhatia, 2002. Water is an economic good: How to use prices to promote equity, efficiency, and sustainability, *Water Policy*, 2002(4): 1-17.
- Ruttan, V.M., and Y. Hayami, 1984. Towards a theory of induced institutional innovation, *Journal of Development Studies*, 20:203-223.
- Saich, T., 2004. *Governance and Politics of China* (2nd edition), New York: Palgrave Macmillan.
- Schotter, A., 1981. *The Economic Theory of Social Institutions*, Cambridge: CUP
- NDRC, and MOC, 2003. *Survey Report on the Industrialization and Marketization Reform of Wastewater Treatment and Solid Waste Disposal in China* (in Chinese).
- Seippel, Ø., 2000. Ecological modernization as a theoretical device: strengths and weaknesses, *Journal of Environmental Policy & Planning*, 2: 287-302.

- SEPA, 2007. *China Environmental Quality Report 2006* [Zhongguo Huanjing Zhuangkuang Gongbao], June of 2007. In: <http://www.zhb.gov.cn/plan/zkqb/06hjkqb>. (in Chinese)
- Seppälä, O., J. Hukka, and T. S. Katko, 2001. Public-private partnerships in water and sewerage services – Privatization for profit or improvement of service and performance? *Public Works Management & Policy*, vol.6, No.1, pp.42-58.
- Seroa Da Motta, R., A. Thomas, L.S. Hazin, J.G. Feres, C. Nauges, and A.S. Hazin, 2004. *Economic Instruments for Water Management: The Cases of France, Mexico and Brazil*, Massachusetts: Edward Elgar Publishing, Inc.
- Shao, Y.S., 2001. Water Tariff Reform and Public Participation, in: proceeding regarding “21st International Urban Wastewater Treatment and Reuse Development Workshop”, Beijing, November 27-29, 2001 (in Chinese).
- Shen, D.J., 2003. Water rights and their management: A comparative country study and its implication for China, in Figuères, et al. (eds.), *Rethinking Water Management: Innovative Approaches to Contemporary Issues*, UK and USA: Earthscan Publications Ltd.
- Smith, L. G., 1983. *Impact assessment and sustainable resource management*. Harlow, UK: Longman.
- Song, X.T., 2000. Characteristics and Countermeasures regarding the Development of China’s Urban Water Supply and Sewerage, *China Water & Wastewater*, 2000 (1) (in Chinese).
- Sonnenfeld, D.A., and A.P.J., Mol, 2002. Globalization and the transformation of environmental governance, *American Behavioural Scientist*, vol.45, No.9, May 2002, pp.1318-1339.
- Sonnenfeld, D.A., and A.P.J., Mol, 2002. Globalization and the transformation of environmental governance, *American Behavioural Scientist*, vol.45, No.9, May 2002, pp.1318-1339.
- Spaargaren, G., 2000. Ecological Modernization theory and domestic consumption, *Journal of Environmental Policy & Planning*, 2, 1, pp.323-335.
- Spaargaren, G., and A.P.J. Mol, 1992. Sociology, environment, and modernity: Ecological Modernization as a theory of social change, *Society and Natural Resource*, vol.5, pp.323-344.
- Spaargaren, G., and B. van Vliet, 2000. Lifestyles, consumption and environment: The ecological modernization of domestic consumption, *Environmental Politics* 9, No.1, pp.50-76.
- Spiller, P.T., and W. Savedoff, 1997. Commitment and governance in infrastructure sectors, in Willig, Uribe and Basañes (eds.) *Can Privatization Deliver Infrastructure for Latin America?*, Baltimore, Maryland: Johns Hopkins University Press.
- Tong, X.C., 2005. Problems of local legislation for concession management (in Chinese), October 8 of 2005, at: www.h2o-china.com (in Chinese).

- Truton, A.R., H.J. Hattingh, G.A. Maree, D.J. Roux, M. Claassen, and W.F. Strydom, (eds.), 2007. *Governance as A Dialogue: Government-Society-Science in Transition*, Berlin: Springer
- US Department of Commerce, 2005. *Water Supply and Wastewater Treatment Market in China*. In: <http://www.its.doc.gov>.
- US National Research Council, 2002. *Privatization of Water Services in the United States*, Washington DC: National Academy Press.
- USEPA (Environmental Protection Administration of US), 2004. International experiences with economic incentives for protecting the environment, Washington DC, US.
- Van den Burg, S., 2006. *Governance through Information*, Wageningen: Wageningen University (PhD thesis).
- Van Tatenhove, J., and P. Leroy, 2003. Environment and participation in a context of political modernization, *Environmental Values*, 12 (2003), pp.155-174.
- Van Tatenhove, J., B. Arts, and P. Leroy, (eds), 2000. *Political Modernisation and the Environment: The Renewal of Policy Arrangements*, Dordrecht/Boston/London: Kluwer Academic Publishers.
- Van Tatenhove, J., B. Arts, and P. Leroy, 2000. Political Modernisation, In: van Tatenhove et al. (eds.), *Political Modernisation and the Environment: The Renewal of Environmental Policy Arrangement*. Dordrecht/Boston/London: Kluwer Academic Publishers.
- Van Vliet, B., 2002. *Greening the Grid: The Ecological Modernization of Network-bound Systems*, Wageningen: Wageningen University (PhD thesis).
- Vining, A., and A. Boardman, 1992. Ownership vs. Competition: Efficiency in public enterprise, *Public Choice*, 123: p.205-239.
- Walsh, K., 1994. Citizens, charters and contracts. In: R. Keat, N. Whitely and N. Abercrombie (eds), *The Authority of the Consumer*, London: Routledge.
- Wang, R.S., H.Z. Ren, and Z.Y. Ouyang, (eds.), 2000. *China Water Vision: The Eco-sphere of Water, Life, Environment & Development*, Beijing: China Meteorological Press.
- Wang, Y.H., 1999. The status quo and reform strategies of water price in China, *Proceeding of International Workshop on 21st century Chinese Urban Water Management*, organized by the MOC and UNDP, Beijing, China, 1999.
- Wattanapinyo, A., 2006. *Sustainability of Small and Medium-sized Agro-Industries in Northern Thailand*, Wageningen: Wageningen University (PhD thesis).
- Weale, A., 1992. *The New Politics of Pollution*, Manchester: Manchester University Press.
- Winpenny, J., 1994. *Managing Water as an Economic Resource*, London: Routledge.

- World Bank, 2004. *Public and Private Sector Roles in Water Supply and Sanitation Services*, Washington D.C.: the World Bank.
- World Bank, 2006a. *North China Water Quality Study Program Component E: Water Sector Regulatory and Institutional Study*, Washington D.C.: the World Bank.
- World Bank, 2006b. *China: Water Quality Management – Policy and Institutional Considerations*, September 2006, Washington D.C.: the World Bank.
- World Bank, 2007. *Cost of Pollution in China*, February 2007, Washington D.C.: the World Bank.
- Wu, W.J., 2001. *Study on Measurements and Institutions for Pricing Water*, Nanjing: Hohai University (MSc thesis, in Chinese).
- Wu, X.Y., 2002. Models of urban management institutions and the development trends, *Urban Management*, vol.6 (in Chinese).
- Xie, L., and A.P.J. Mol, 2006. The Role of Guanxi in the Emerging Environmental Movement in China, In: McCright, A.M., Nichols Clark, T., (eds.), *Community and Ecology: Dynamics of Place, Sustainability, and Politics* (Research in Urban Policy 10), pp.269-292, Oxford, UK : Elsevier, JAI Press.
- Xinhua News Agency, 2006a. *China Surveys Rural Drinking Water and Hygiene*, August 13,2006. At: <http://www.china.org.cn/english/2006/Aug/177810.htm>.
- Xinhua News Agency, 2006b. *Clean, Safe Water for All Chinese Rural Residents by 2015*, September 5, 2006. At: <http://www.china.org.cn/english/2006/Sep/180067.htm>.
- Xinhuanet, 2004. Guiyang increasing the wastewater treatment charges by 0.20RMB per cubic meter, June 18, 2005, in: <http://www.h2o-china.com/news/23118.html> (in Chinese).
- Xue, L., U.E., Simonis, and D.J. Dudek, 2007. Environmental governance for China: Major recommendations of a task force, *Environmental Politics*, vol.16, No.4, pp.669-676.
- Xue, L., U.E., Simonis, and D.J. Dudek, et al., 2006. *Environmental Governance in China (Report of the Task Force on Environmental Governance to the CCICED)*, available online at: <http://skylia.wz-berlin.de/pdf/2007/p07-001.pdf>.
- Yang, G.B., 2005. Environmental NGOs and institutional dynamics in China, *The China Quarterly*, vol.181, March 2005, pp.46-66.
- Yang, K.F., 2003. Assessing China's public price hearings: Symbolic aspects, *International Journal of Public Administration*, Vol.26, No.5, pp.497-524.
- Zeng, S.Y., 1999. *Integrated Water Resource Management and Its Operational Mechanism Study*, Beijing: Tsinghua University (PhD thesis, in Chinese)

- Zeng, S.Y., 2004. *Methodologies for Environmental Management and Environmental Sociology*, Beijing: Tsinghua University Press (in Chinese).
- Zhang L. 2006. Water regulation needed to improve, November 17 of 2006, at: www.h2o-china.com, (in Chinese).
- Zhang, D.Y., 1999. Exploration, utilization and management of water resource in China, in *Proceedings of the Sino-Dutch Seminar on Water Management*, April 13-14, 1999, Beijing.
- Zhang, L., 2002. *Ecologizing Industrialization in Chinese Small Towns*, Wageningen: Wageningen University (PhD thesis).
- Zhang, L., A.P.J. Mol, and D.A. Sonnenfeld, 2007. The interpretation of Ecological Modernization in China, *Environmental Politics*, 16, 4, pp. 659-668
- Zhang, L.Z., 2005. *Urban Water Tariff Study: Impact Factors and Policy Analysis*, Beijing: Tsinghua University (MSc thesis, in Chinese).
- Zhong, L.J., 2005. working paper on *Governing Urban Water Flow in Chinese Cities*.
- Zhong, L.J., and A.P.J. Mol, 2007. Emerging environmental democracy in China: Public hearings on water tariff setting, *Journal of Environmental Management* (forthcoming), doi:10.1016/j.jenvman.2007.04.018.
- Zhong, L.J., and T. Fu, 2005. BOT applied in Chinese wastewater sector, paper presented on ADB workshop on *Sanitation and Wastewater Management: The Way Forward*, Malina, 19-20 September 2005.
- Zhong, L.J., X.X. Wang, and J.N. Chen, 2006. Private participation in China's wastewater service under the constraint of charge rate reform, *Water Science and Technology: Water Supply*, vol. 6, No.5, pp 77-83.

Appendices

Appendix I List of Interviewees

Notes: interviewees are listed according to interviews in different provinces or cities.

Guizhou Province

Ms. Zhang, Division Director of Regulation Division, Guizhou Price Bureau

Mr. Wang, Secretary of the Party Committee, Guizhou Water Resource Bureau

Mr. Li, Division Director of Water Resource Division, Guizhou Water Resource Bureau

Mr. Cai, Director, Guizhou Hydraulic Engineering Administrative Bureau

Mr. Zhu, Division Director of Urban Construction, Guiyang Construction Commission

Ms. Nie, Division Director of General Affairs, Guizhou Statistical Bureau

Mr. Long, Division Director, Guizhou Development and Reform Commission

Mr. Chen, Vice Director, Xingren County Water Supply General Company

Mr. Zeng, General Manager, Zhenfeng County Water Supply Company

Maanshan City

Mr. Xu, Director, Maanshan Construction Commission

Mr. Bao, Division Director of Urban Construction Division, Maanshan Construction Commission

Mr. Yi, Division Director of Urban Construction Division, Maanshan Construction Commission

Mr. Huang, Division Director of Planning and Financing Division, Maanshan Construction Commission

Mr. Wang, Division Director of Human Resource Division, Maanshan Construction Commission

Mr. Zhou, Division Director of Regulation Division, Maanshan Construction Commission

Mr. Gao, Vice Director, Maanshan State-owned Assets Administrative Office

Mr. Luo, Vice Director, Maanshan Development and Reform Commission

Mr. Yang, Division Director of Public Sector Division,

Mr. Cao, Division Director of Investment Division, Maanshan Development and Reform Commission

Mr. Gao, Vice Director, Maanshan Price Bureau

Mr. Tao, staff, Maanshan Price Bureau

Mr. Zhu, Chief Engineer, Maanshan Environmental Protection Bureau

Mr. Ren, General Manager, Maanshan Capital Water Co.Ltd

Mr. Bo, Vice General Manager, Maanshan Capital Water Co.Ltd

Mr. Zhang, Chief Engineer, Maanshan Capital Water Co.Ltd

Mr. Wang, staff, Maanshan Capital Water Co.Ltd

Mr. Cui, staff, Maanshan Capital Water Co.Ltd

Shanghai City

Mr. Chen, Division Director of Regulation Division, Shang Water Authority

Mr. Ma, Director, Shanghai Sewerage Division

Mr. Zhu, staff, Shanghai Sewerage Division

Mr. Ma, General Manager, Shanghai Sewerage Company

Mr. Jin, General Manager, Shanghai Youlian Zhuyuan No.1 Wastewater Treatment Plant

Mr. Liang, Vice General Manager, Shanghai Youlian Zhuyuan No.1 Wastewater Treatment Plant

Macao City

Mr. Felix Fan, Vice General Manager, Macao Water Supply Co. Ltd

Ms. Lily Fang, Division Manager of Performance Management, Macao Water Supply Co. Ltd

Ms. Felicity Yang, staff, Macao Water Supply Co. Ltd

Mr. Lin, Macao Governmental Delegate in charge of water supply sector

Appendix II Major Data Sources

Chinese Water and Wastewater Association Yearbook 2004.

Chinese Water and Wastewater Association Yearbook 2005.

Guizhou Price Bureau, water tariff (including WWTC) of 87 cities and counties, September 30 of 2006 .

Guizhou Water Resource Bureau, Official Gazette on Guizhou Water Resource, 2003.

Guizhou Water Resource Bureau, Official Gazette on Guizhou Water Resource, 2004.

Guizhou Water Resource Bureau, Official Gazette on Guizhou Water Resource, 2005.

Guizhou Water Resource Bureau, Official Gazette on Guizhou Water Resource, 2006.

MOC, China Urban Construction Statistics Yearbook 2000, Beijing: China Architecture & Building Press.

MOC, China Urban Construction Statistics Yearbook 2001, Beijing: China Architecture & Building Press.

MOC, China Urban Construction Statistics Yearbook 2002, Beijing: China Architecture & Building Press.

MOC, China Urban Construction Statistics Yearbook 2003, Beijing: China Architecture & Building Press.

MOC, China Urban Construction Statistics Yearbook 2004, Beijing: China Architecture & Building Press.

MOC, China Urban Construction Statistics Yearbook 2005, Beijing: China Architecture & Building Press.

NBS and SEPA, China Statistical Yearbook on Environment 2006, Beijing: China Statistical Press.

NBS, China City Statistical Yearbook 2000, Beijing: China Statistical Press.

NBS, China City Statistical Yearbook 2001, Beijing: China Statistical Press.

NBS, China City Statistical Yearbook 2002, Beijing: China Statistical Press.

NBS, China City Statistical Yearbook 2003, Beijing: China Statistical Press.

NBS, China City Statistical Yearbook 2004, Beijing: China Statistical Press.

NBS, China City Statistical Yearbook 2005, Beijing: China Statistical Press.

NBS, China Statistics Yearbook 2003, Beijing: China Statistical Press.

NBS, China Statistics Yearbook 2004, Beijing: China Statistical Press.

NBS, China Statistics Yearbook 2005, Beijing: China Statistical Press.

NBS, China Statistics Yearbook 2006, Beijing: China Statistical Press.

Summary

China has been witnessing an unprecedented period of continuous high economic growth during the past three decades. But this has been paralleled by severe environmental challenges, of which water problems are of key importance. This thesis addresses the urban water challenges of contemporary China, by focusing especially on the institutional traditions and innovations in Chinese water policies and governance, basically for two additional reasons. First, the large majority of studies regarding China's urban water sector have focused on technological innovations and – to a lesser extent – the economic costs, leaving institutional dimensions often unaddressed. This thesis is one of the first to look more systematically into several institutional innovations that take place in contemporary urban water governance around China. Second, China's water problems are closely linked to many societal questions and debates that characterise current transitional China, such as the equal distribution of costs and benefits in a market economy, democracy and participation, effective governance and the relation between state and market. Our institutional analyses aim to focus exactly on the linkage between water challenges and these other main developments.

Inspired by a series of theoretical considerations in environmental sociology, this thesis, on the one hand, develops an Ecological Modernization-based theoretical framework for studying institutional transformations of China's urban water sector. As such, it interprets the current institutional innovations as a (potential) trend of ecological modernization in China. On the other hand, this thesis provides implications for the development of a more China-specified Ecological Modernization theory. And as such it contributes to the reframing of Ecological Modernization theory to make it relevant beyond western Europe.

Traditionally, the Chinese state had a monopoly in managing and arranging the urban water sector, both in terms of water supply and waste water treatment. Along with the Chinese economic reforms since the 1980s and its movement from a centrally planned economy towards a market-based economy, this state monopoly is changing dramatically. This change can be labelled the modernization of urban water governance. Using an Ecological Modernization perspective, this thesis investigates three major

environmental-induced institutional innovations of Chinese urban water sector, thereby focusing on the changing roles of and relations between the state, economic actors and civil society.

First, China has gradually increased attention to, research on and experiments with the application of economic instruments, as well as the involvement of the private sector, in urban water management. Although we seem to be at only an early stage of both innovations, which prevents us from drawing any final conclusion regarding their impacts on the Chinese water sector, it has become clear that the traditional full governmental provision of water services has changed dramatically in China. Economic and market dynamics are increasingly playing important roles; prices of water and waste water treatment have increased dramatically, subsidies are more and more abandoned (with some exceptions for vulnerable groups and crucial state functions), and economic actors appear on the stage of policy implementation and sometimes even policy formulation. While in principle many of these innovations seem to contribute to more efficient and effective urban water provision, much room for improvement remains, also because of the current lack of attention to institutional design by the Chinese authorities.

Second, the Chinese state is redefining the state-market relations within the urban water sector in order to deal with – among others - the environmental dimensions of water services (such as natural resource protection, efficient infrastructure, and pollution control). Not only the liberalization and commercialization of conventional governmental water utilities but also the emergence and spread of private sector involvement in water service provision contribute to new roles and responsibilities of state and market actors, and to new modes of urban water governance. Various models of public-private partnerships are being tried and implemented across China, where a (potential) market is being formulated for capital raising and financing, constructing infrastructure and facilities, and executing service provisions. This comes along with debates and struggle over tasks and responsibilities left for the state, both at the national and the local level. And with that also more fundamental debates on the nature of water, ranging between a public good and a private good.

Thirdly, the new institutional arrangement of public hearings for setting water tariffs provides evidence that civil society starts to become involved in governmental decision-making processes, although this new institution has a different outlook and

performance from public hearings developed in Western countries. Our investigations into price public hearings in various Chinese cities witness that the Chinese government seems to be moving towards to a trend of more open, transparent and accountable governance, although the impact of these public hearings is still controversial and differs from city to city. Issues of democracy and equity are constantly debated and defined in the practical operationalization of these institutional arrangements. Price public hearings do not stand on its own. This tendency of further civil society involvement can also be found in other developments, such as the increasing room for maneuver for NGOs (e.g. with respect to major water issues such as dams) and innovations in the new Environmental Impact Assessment law.

In sum, this thesis on the one side has provided evidences that contemporary China is witnessing at least experiments with a modernization of water governance that can be understood in terms of ecological modernization. For instance, decentralization, the involvement of various non-state actors, further reform of state-market relations, increasing use of economic and market dynamics, and a wider contribution of civil society and public participation are typical developments that reflect an ecological modernization agenda and theory. On the other side, this thesis shows differences between what can be labeled a Western style Ecological Modernization framework and the actual practice of urban water governance reform in China, due to the different economic, political and societal variables in China. This implies the need for specifying where Western style ecological modernization practices differ from what we can expect in state-in-transition, and arguable also the need for a Chinese style Ecological Modernization theory. This thesis does not attempt to formulate such a theory, but does provide some of the ingredients and building stones for that.

Samenvatting

De ongekende economische groei die China de laatste dertig jaar heeft doorgemaakt, heeft een grote weerslag op het milieu van dit land. China wordt geconfronteerd met serieuze milieuproblemen waarvan het waterbeheer een van de grootste uitdagingen vormt. Dit onderzoek bestudeert de stedelijke waterbeheerproblematiek van het hedendaagse China en legt daarbij de nadruk op institutionele tradities en innovaties in het Chinese waterbeleid en -beheer. Twee beweegredenen liggen ten grondslag aan dit onderzoek. Ten eerste beperken de meeste studies over China's stedelijke watersector zich tot technologische innovaties en, in mindere mate, tot analyses van economische kosten. Zij geven echter weinig inzicht in institutionele dimensies en achtergronden. Dit onderzoek is dan ook een van de eerste pogingen om systematisch een aantal institutionele innovaties in Chinees stedelijk waterbeheer te bestuderen. Ten tweede is China's waterbeheerproblematiek nauw verbonden aan een aantal maatschappelijke vaagstukken en debatten die tekenend zijn voor de huidige transitieperiode in China. Voorbeelden zijn de distributie van kosten en baten in de markteconomie, democratie en participatie in beleid, effectief bestuur, en de relatie tussen overheid en markt. Het doel van dit onderzoek is dan ook het maken van een institutionele analyse van de verbanden tussen waterbeheerproblemen en de genoemde maatschappelijk ontwikkelingen.

De ecologische moderniseringstheorie wordt gebruikt als theoretisch kader voor het bestuderen van institutionele transformaties in de Chinese watersector. Enerzijds interpreteert het proefschrift de huidige institutionele innovaties als een (potentiële) trend van ecologische modernisering. Anderzijds geeft het een aanzet tot een meer China-specifieke ecologische moderniseringstheorie. Hiermee draagt dit onderzoek bij aan een herformulering van deze ecologische moderniseringstheorie, zodat deze relevant wordt voor het bestuderen van milieugeïnduceerde sociale veranderingen in landen buiten Europa.

Traditioneel gezien hebben Chinese autoriteiten een monopolypositie bij het besturen van de stedelijke watersector (zowel drinkwatervoorziening als waterzuivering). Sinds de economische hervormingen van de jaren tachtig en de omschakeling van een centraal geplande economie naar een meer markt georiënteerd model, is deze rol sterk gewijzigd.

Deze verandering duidt op de modernisering van stedelijk waterbeheer. Vanuit een ecologisch moderniseringsperspectief onderzoekt dit proefschrift dan ook drie grote milieugeïnduceerde, institutionele innovaties in de Chinese stedelijke watersector en de veranderende rollen van en relaties tussen overheid, economische actoren en 'civil society'.

De eerste innovatie betreft de aandacht die China besteedt aan economische instrumenten en het betrekken van private partijen in stedelijk waterbeheer. Deze ontwikkelingen zijn nog in een vroeg stadium, waardoor er moeilijk conclusies kunnen worden getrokken over hun precieze invloed. Wel kan worden geconcludeerd dat het traditionele, centraal beheerde systeem drastisch is veranderd. Economische ontwikkelingen en marktdynamiek spelen een steeds grotere rol; de prijzen van drinkwater en waterzuivering zijn sterk toegenomen, overheidssubsidies zijn gekort (met uitzondering van die voor kwetsbare groepen en cruciale overheidsfuncties) en economische actoren zijn meer zichtbaar in processen van beleidsimplementatie en soms ook beleidsformulering. Hoewel deze innovaties klaarblijkelijk bijdragen aan een meer efficiënte en effectieve watervoorziening, is er nog veel ruimte voor verbetering. Daarbij hebben Chinese autoriteiten nog te weinig aandacht voor het belang van institutionele verbeteringen, en zijn ze te sterk gepreoccupeerd met technische verbeteringen.

De tweede ontwikkeling is het herdefiniëren van overheid–markt relaties binnen de stedelijke water sector om o.a. milieuproblemen te kunnen oplossen (bescherming van natuurlijke hulpbronnen, efficiënte infrastructuur en het tegengaan van milieuvervuiling). Niet alleen de liberalisatie en commercialisering van conventionele nutsbedrijven in de water sector, maar ook de opkomst en verspreiding van private waterdiensten dragen bij aan nieuwe rollen en verantwoordelijkheden voor overheid en marktactoren, en leiden tot nieuwe arrangementen in het stedelijk waterbeheer. Een aantal modellen van publiek-private samenwerkingsverbanden wordt momenteel in China uitgetest en geïmplementeerd. Deze publiek-private samenwerkingsverbanden bedienen steeds meer (potentiële) markten, vergaren kapitaal en financiering, zorgen voor de opbouw van infrastructuur en faciliteiten, en bieden diensten aan. Tegelijkertijd is er discussie en strijd over welke verantwoordelijkheden en taken bij de overheid (behoren te) blijven, op nationaal en lokaal niveau. Hier liggen ook meer fundamentele debatten aan te grondslag over waterbeheer: dient water beschouwd te worden als een collectief goed of als een privaat goed?

De derde innovatie is het gebruik van een nieuw institutioneel arrangement voor meer participatie in stedelijk water beheer: de openbare hoorzittingen voor het vaststellen van watertarieven in China. Hierbij worden verschillende stakeholders en ook ‘civil society’ betrokken bij het beslissingsproces. Tegelijkertijd blijven er wezenlijke verschillen op het gebied van doelstellingen en resultaten in vergelijking met Westerse systemen van openbare hoorzittingen. Case studies naar openbare hoorzittingen voor het vaststellen van tarieven in een aantal Chinese steden laat zien dat de Chinese autoriteiten steeds meer mogelijkheden geven voor openheid, transparantie en aansprakelijkheid van bestuur. Desondanks zijn dergelijke hoorzittingen nog steeds controversieel en zijn er grote verschillen tussen hoorzittingen van verschillende steden. Democratie en gelijkheid zijn constant onderwerp van debat en worden vaak pas tijdens de operationalisatie van deze nieuwe institutionele arrangementen gedefinieerd. De opkomst van een grotere mate aan medezeggenschap is ook zichtbaar in andere ontwikkelingen in het Chinese water- en milieubeheer, zoals de toenemende handelingsruimte voor NGOs (bijvoorbeeld in het geval van grote water projecten voor de bouw van dammen) en de mogelijkheden die de nieuwe Wet Milieu Effect Rapportage biedt.

Dit onderzoek toont aan dat China op zijn minst aan het experimenteren is met een modernisering van het waterbeheer, hetgeen in termen van ecologische modernisering kan worden begrepen. Decentralisatie, het betrekken van verschillende niet-overheid actoren in het waterbeheer, verdere hervormingen van overheid-markt relaties, toenemend gebruik van marktdynamiek, en een bredere bijdrage van ‘civil society’ en burgerparticipatie zijn karakteristieken van deze Chinese ecologische moderniseringsagenda. Anderzijds tonen de bevindingen ook de verschillen aan tussen de Chinese situatie en Westerse stijlen van ecologische modernisering. De specifieke economische, politieke en sociale omstandigheden in China liggen ten grondslag aan deze verschillen. Deze conclusies vragen om meer kennis over hoe ecologische moderniseringsagenda kunnen worden geïmplementeerd in een Chinese context, en verdere theorievorming rond de formulering van een Chinese ecologische moderniseringstheorie. Hoewel dit proefschrift niet pretendeert een dergelijke theorie te formuleren, geeft het wel een aanzet en bruikbare elementen daarvoor.

About the Author

Lijin Zhong was born on 15 January 1977 in Guiyang City, Guizhou Province, China. She obtained her Bachelor and Master degree in Environmental Engineering at Tsinghua University in July 2000 and January 2003, respectively. In May 2003, she came to Wageningen University to pursue her doctorate.

Major publications:

Zhong, L.J., and A.P.J. Mol (draft) **Water price reforms in China: Policy-making and implementation**, journal paper draft (under review).

Zhong, L.J., A.P.J. Mol, and Tao Fu (draft) **Public private partnership in China's water sector**, *Environmental Management* (accepted).

Zhong, L.J. & A.P.J. Mol, (2007) **Participatory environmental governance in China: Public hearings on water tariff setting**, *Journal of Environmental Management* (forthcoming), doi:10.1016/j.jenvman.2007.04.018

Zhong, L.J., X.X. Wang, and J.N. Chen, (2006) **Private participation in China's wastewater service under the constraint of charge rate reform**, *Water Science & Technology: Water supply*, vol.6, No.5, pp 77-83

Fu, T., M. Chang and L.J. Zhong, (forthcoming), *Reform of China's Urban Water Sector*, UK: IWA Publishing.

Fu, T., M. Chang and L.J. Zhong, (2006) *Chinese Urban Water Sector Reform: Empirical Experiences and Case Studies*, Beijing: China Architecture & Building Press (in Chinese).

Cover design: Bo Lou

Print: Ponsen & Looijen Wageningen, the Netherlands