

**The Asian Development Bank
and the
People's Republic of China:**

**Partnership in the
Water Supply and Wastewater Treatment Sectors**

I. Introduction

The water resource and availability in the People's Republic of China (PRC) varies significantly across regions and during different time of the year. This huge difference in water availability with regions and seasons is one of the biggest challenges facing the PRC.

There are serious water shortages in northern PRC. Per capita water availability ranges from 360 to 750 m³ (lower than international definition of water scarcity of 1,000 m³/person). More than 40% of the water in the seven major river basins does not meet the Grade III national quality standard. Major lakes have serious eutrophication problems. The steps which need to be taken to address the pollution of lakes and rivers include: (i) strengthening laws, regulations and institutions to address trans-jurisdiction pollution; (ii) adopting river basin management approaches to water resource management; and (iii) addressing non-point pollution.

Although more than 90% of the urban households in large cities have access to piped water supply, the high coverage indicator obscures shortages in many cities, particularly those in the water-scarce northern provinces, of good quality raw water supply and water supply delivery capacities. There is a need to improve the access to safe drinking water in many cities as well as in the suburban and rural areas. Bottled water is a very expensive alternative to providing clean potable tap water. The financial burden of buying bottled water falls most heavily on the poor and can account for a disproportionately high portion of their limited incomes. The poor are most vulnerable to environment-induced diseases and are least capable of paying for adequate medical attention for digestive tract ailments associated with drinking polluted water. Improving the supply of clean drinking water and reducing the pollution of rivers and lakes is part of any pro-poor development strategy. The Government is aware that addressing environmental problems is critical for sustainable development and poverty reduction. Much remains to be done to reduce the adverse impact of the shortages of clean drinking water and water pollution on the poor.

The demand for water is rising with increasing urbanization where more than half the population will live in cities by 2020. Despite the shortages of water, the rate of wastewater reuse is low. Currently only about 40% (34% in 1999) of urban wastewater is treated and the rest is discharged untreated to rivers and lakes. More investment is needed to supply clean drinking water and to treat wastewater and sewerage. Wastewater charges are lower than the marginal cost of pollution treatment so there is little commercial incentive to invest in wastewater treatment facilities. Increasing water and wastewater tariffs would encourage water conservation; rationalize the use of a scarce resource and to cover the construction and operation cost of water supply and wastewater treatment projects and resource depletion.

The Government has accorded priority in the Tenth Five Year Plan (2001-2005) to address these issues through policy reform, increased investment and improved urban infrastructure management. The Government's strategy in the water sector focuses on (i) developing water sources; (ii) protecting existing sources by controlling industrial and residential pollution; (iii) controlling over-extraction from groundwater resources; (iv) introducing water efficient

technologies and operations and (v) using appropriate pricing mechanisms to encourage conservation and generate necessary funds for operation, maintenance, and investment. The Government also plans to increase centralized urban wastewater treatment during the Tenth Five-Year Plan period by 26 million m³. This will raise the treatment rate of municipal wastewater from 34% to 45%. Cities discharging more than 500,000 m³/day are expected to reach a treatment rate of 60%. National guidelines also require major cities, such as provincial capitals, to achieve a wastewater treatment rate of 70% by 2010. The Government also plans to increase the use of recycled water by industries from 50% in 2000 to 60% in 2005. To complement the increased investment in urban water supply and wastewater treatment facilities, the Government plans to increase water and wastewater tariffs to achieve commercial levels and improve financial management options for water and wastewater.

II. ADB Experience and Strategy in Water and Wastewater Sectors

The ADB is active in the water supply and wastewater sectors to help improve living standards and economic productivity reduce environmental degradation and promote sustainable development. ADB lending to the water supply and wastewater treatment sector started in 1993, and since then 11 loans totaling \$1,147 million for water supply and sanitation projects, largely in the urban areas, have been approved. These loans have financed about 4 million m³/day of capacity to supply clean drinking water and about 2 million m³/day of wastewater treatment. Better water supply and sanitation facilities improve the living standards and productivity of urban residents, arrest environmental degradation, and sustain rapid economic growth. Developing efficient water supply systems, including the treatment and distribution of raw water and the treatment and disposal of wastewater, will require substantial investments in both physical infrastructure and human resource development. ADB is financing priority projects for urban wastewater, sewage treatment, water supply, and water resources management in line with ADB's strategy to support environmental improvement in the PRC. To maximize development impact, especially among urban poor, ADB's involvement has been targeted in densely populated urban areas.

ADB experience in the water supply and wastewater sectors indicates that projects are well planned and implemented and that water and wastewater tariffs are increased as required. For example, under the wastewater treatment component of the Anhui Environmental Improvement Project and the Fuzhou Water Supply and Wastewater Treatment Project, initial concern about cost recovery was mitigated through policy dialogue on tariff increases and the introduction of commercial management principles. Further, willingness-to-pay analysis has indicated that consumers are willing to pay substantially higher prices for water, and to a certain extent, are willing to pay for wastewater treatment. This was readily apparent in the case of Dalian where tariffs have increased more than 11 times since ADB's initial involvement in the project in 1993. Adjusting tariffs to promote domestic resource mobilization and provide market-based signals for consumers to conserve water are major elements of ADB's policy dialogue for projects in the water supply and wastewater sectors.

The principal objectives of ADB lending in the sector are to: (i) address environmental issues in the water sector; (ii) provide safe drinking water and sanitation facilities to improve the health and productivity of the large populations in the concerned cities and municipalities; (iii) improve financial management to generate internal resources for investment and to ensure sustainable operations and maintenance; and (iv) improve institutional capacity to effectively operate and maintain urban systems. These support the ADB water policy.

In the water sector, ADB's strategy is focusing on (i) improving the efficiency of water supply and distribution systems through investment in physical infrastructure, (ii) promoting improved corporate governance and commercial management to enhance the potential for future private sector involvement, (iii) improving cost recovery by strengthening tariff systems and structures for raw and treated water, and (iv) ensuring water resources conservation and environmental protection through the continuing support of policy, legislative and regulatory provisions.

III. ADB's Policy Partnership with PRC

In the water sector, ADB financed investments are focusing on improving the efficiency of water supply and distribution systems and reducing water pollution through investment in physical infrastructure. These investments are complimented by ADB's agenda for policy dialogue in the wastewater and water resources sectors which covers the following areas: (i) water conservation; (ii) watershed management; (iii) upstream pollution prevention and control; (iv) wastewater management; (v) non-point pollution control; (vi) clean production technologies; (vii) legal framework, regulatory enforcement and monitoring; (viii) corporate governance and enterprise reform; (ix) tariff reforms for raw water supply and wastewater treatment; (x) improving access to safe drinking water and sanitation in rural areas; and (xi) promoting private sector involvement.

A. Water Conservation:

The issue of water conservation has been an important part of the Government and ADB's agenda in the water sector. The water conservation policies that have been pursued in conjunction with ADB financed Projects include ensuring that system losses are minimized through efficient commercial operations, improved lining of water delivery channels, leakage detection, and repair; and providing market-based incentives to reduce water use through adequate pricing of water and wastewater tariffs. Water conservation policies have been addressed by ADB projects through the adoption of adequate pricing of water and promoting commercial operations. ADB is pleased that the Government will use the pricing mechanism during the tenth Five Year Plan to help allocate water resources between competing uses such as agriculture, industry and municipal. This will encourage the efficient utilization of scarce water resources and will encourage water conservation.

B. River Basin Management

Among other things, TA 2817-PRC: Strategic Options for the Water Sector provided early assistance in identifying areas requiring revision in the 1988 Water Law. Basic principals and policies for water resources management were defined in the 1988 Water Law which aimed to direct, coordinate and standardize all activities for the development, utilization, and protection of water resources. The Water Law needed to be revised to clarify diverse responsibilities for water management, which have emerged following rapid economic growth, increasing pressure on water resources and the transition from a centrally planned to a market oriented economy. The TA provided some concepts which were considered for the revision of the Water Law to provide the basis for a modern policy framework, focusing in four areas: (i) water allocation, rights and permits, (ii) water resource management systems, with respect to the roles of the river basin management institutions and provincial and local governments, as well as trans-jurisdiction issues and water user/supplier organizations; (iii) efficiency of use and conservation of water; and (iv) water quality control, covering surface and groundwater, and standards for pollution. The amended Water Law was adopted by the NPC in August 2002 and became effective on 1 October 2002. The revised law will provide a legal framework for implementation

mechanisms for water pricing and cost recovery that will facilitate effective and efficient water management.

Because of the significance of the Yellow River basin and importance of water resources management, the Ministry of Water Resources is drafting the Yellow River Law to promote more integrated river basin management. ADB is supporting this effort under TA 3708-PRC: Strategic Planning for the Preparation of the Yellow River Law. The Yellow River, the second largest river system in the PRC, covers nine provinces and autonomous regions: Qinghai, Sichuan, Gansu, Ningxia, Inner Mongolia, Shaanxi, Shanxi, Henan, and Shandong. About 107 million people live in the Yellow River Basin, which has a total drainage area of 795,000 km². Because of the significance of the Yellow River Basin and importance of water resources management, the Government has made the Yellow River Law as one of its top priorities for legislation in the water sector that promotes integrated river basin management. ADB is supporting the effort of the Ministry of Water Resources by financing strategic studies relating to integrated water resources management of the Yellow River Basin and research for legal countermeasures for outstanding problems in the Yellow River Basin. Among other things, ADB's support review relevant Government policies and plans and the current institutional setup for water resources management in general, and for the Yellow River in particular and propose policy and legal recommendations in formulating the Yellow River Law. This work will provide the National People's Congress with information and recommendations related to the formulation of the Yellow River Law.

ADB is also providing technical assistance to the State Environmental Protection Agency to evaluate the environmental policy and investment for water pollution control in the Huai River Basin and the Taihu Lake Basin, two of the most important river basins and lakes in the country.¹ The outputs of the TA include (i) a comprehensive evaluation report identifying performance compared with targets, and the necessary priority reforms and the phasing required for long-term control of water pollution; (ii) practical recommendations on legal, policy and institutional reforms, as well as financing and investment directions for river basin-based water pollution control; and (iii) an integrated and basin-based evaluation methodology suitable for use in other rivers and lakes, with related training materials and guidelines.

C. Reducing Trans-jurisdiction Pollution

Potential transjurisdictional environmental issues were noted in some ADB projects (e.g. Suzhou Creek Environmental Improvement Project; the Tianjin Water Supply Project; the Harbin Water Supply Project). In the case of Suzhou Creek, the water quality improvement from ADB's project may not meet expectations because of the high pollutant load upstream and at the creek source, Taihu Lake. Taihu Lake and polluted tributaries of Suzhou Creek are outside the boundary of the city of Shanghai, the project site. In Tianjin, two large fertilizer plants in Hubei province have the potential to affect the integrity of the water supply source. Similarly, pollution in the up stream regions of the Songhua River rendered it unfit as a source of raw water. Consequently, a more distant water source needed to be used for the Harbin Water Supply Project.

Many pollutants are transported in rivers across provincial/county boundaries, affecting areas several hundred kilometers down stream from the source. Consideration of trans-jurisdiction pollution issues is one of the important features of the revised WPPC law. Although national

¹ ADB. 2004. *Evaluation of Environmental Policy and Investment for Water Pollution Control in the Huai River Basin and the Taihu Lake Basin*. Manila

legislation addresses trans-jurisdictional water pollution, operational application has been slow, primarily due to the lack of appropriate precedents and practical experience in the PRC.

ADB provided a \$2.1 million cluster TA to help the Government strengthen Trans-jurisdiction Environment Management. The TA has four components: (i) legislation to support trans-jurisdictional water pollution prevention and control; (ii) procedures and methodologies for trans-jurisdictional water quality management; (iii) capacity building; and (iv) dissemination of findings and recommendations for potential application in river basins² A major output of the first component was model river basin legislation developed for the Fen River in Shanxi Province, a major tributary of Yellow River. The Shanxi EPB is considering issuing an Amendment of the Regulation on the Prevention and Control of Water Pollution in the Fen River Basin using the model legislation as a draft. This component identified several key problems in existing national legislation: (i) lack of cross referencing among a number of national laws; (ii) some omissions (e.g., the national laws are silent on how to legally define a trans-jurisdictional pollution event and the actions that can occur following such an event); (iii) a lack of detail and little emphasis on procedure; (iv) a lack of measures to ensure accountability; (v) a lack of public involvement; (vi) upstream/downstream equity issues; and (vii) a lack of common assessment methodology among jurisdictions. While a special law on Trans-jurisdiction Water Pollution Control is unlikely to be enacted, issues on transjurisdictional water quality management will be reflected when the WPPC Law is revised. Although the National People's Congress (NPC) considers the TA results to date to be helpful, amending the WPPC is not yet on the NPC's agenda, as many issues need further study. The second and third components will provide more information and recommendations on trans-jurisdictional water quality management necessary for amending the WPPC. An important output of the second component, a national regulation on trans-jurisdictional water quality management and operational guidelines for implementing the regulation, will be drafted in 2004.

Because of the problems encountered using the Songhua River as a source for clean drinking water, the experience gained with trans-boundary pollution under the above cluster TA and an earlier approach to river basin analysis under a TA for Hai River Wastewater Management and Pollution Control³, ADB provided a TA for the Songhua River Water Quality and Pollution Control Management.⁴ The TA is aimed to strengthen the capacity of Government for policy analysis and pollution control management, and to help in developing a long-term vision and plan for pollution control in the Songhua River. The TA has three phases: (i) data collection and situation analysis, (ii) development of institutional and regulatory mechanisms, and (iii) formulation of a strategic action plan. Phase one is currently being implemented.

D. Wastewater Management

The focus of the policy dialogue on wastewater management is integrated management of industrial and domestic wastewater including on-site treatment and public sewer connections. ADB has supported the Government's policies for wastewater management by providing a number of related environmental loans that included wastewater treatment components in Beijing, Chaohu, Chengde, Fuzhou, Hefei, Qingdao, Shanghai, Tangshan, Tianjin, Wuhan and along the Hai River system. Wastewater treatment was also addressed under the Urban

² Component (i) was completed in 2003. Component (ii) will be completed in 2004. Implementation of Components (iii) and (iv) will begin in late 2004.

³ ADB. 1998. *Technical Assistance to the People's Republic of China for Hai River Basin Wastewater Management and Pollution Control*. Manila.

⁴ ADB. 2003. *Technical Assistance to the People's Republic of China for Songhua River Water Quality and Pollution Control Management*. Manila.

Environmental Improvement Planning TA that strengthened institutions responsible for environmental improvement in a number of cities, and identified future infrastructure requirements.

E. Non-Point Pollution

Over the past two decades, the PRC has made progress in the control and prevention of point source pollution, especially in the area of industrial pollution reduction. With the progress in point source pollution control, management of non-point source pollution (NSP) is becoming increasingly significant in improving quality of PRC's waters. Policies that have traditionally focused on industrial point source pollution control need to be complemented by measures to address NSP, especially in view of the know significant impacts of non-point sources. Against this background, ADB has provided a TA to PRC for study on control and management of rural NSP. The main objectives of the TA are to: (i) help prepare national policies, plans, and programs for the control and prevention of rural non-point source pollution, based on better understandings of the status and trends of the problem; and (ii) strengthen institutional capacity at national and local levels in control and management of rural non-point source pollution. The TA is still ongoing. Major outputs to date include (i) an analytical report on the main problems and underlying causes of rural NSP (under preparation); (ii) a report on international experience with rural NSP control and implications for the PRC's policies, plans, and programs; and (iii) a medium-term national action plan for the control and management of rural NSP, with a focus on pollution generated from livestock production (under preparation).

F. Clean Production Technologies

Most countries have, like PRC, have introduced environmental policies and regulations that focus on end-of-pipe treatments that are not effectively integrated with the policies designed to enhance the efficiency of industrial production. End-of-pipe methods usually impose financial costs on enterprises. This provides incentives for businesses to pay the relatively low pollutant emission fees rather than make the investments necessary to control pollution. ADB's experience is that it is profitable for businesses to adopt clean technologies. The constraints for introducing clean production are not merely financial rate of return considerations. The decision to use clean production involves many issues ranging from intellectual property rights, collateral, technology transfer, subsidies for fuel and raw materials, labor retraining and the development of new markets. At the national level, policies and legislation do not provide sufficient incentives to adopt clean production technologies. The price of water is still set at low levels by the Government. This reduces the incentive to adopt clean technologies. ADB is pleased to note that the pricing issue will continue to be addressed during the Tenth Five Year Plan. Pollution levies are low and enforcement needs to be improved. Cleaner production is an essential part of any comprehensive pollution management system. Significant reductions in pollution loads and more efficient use of resources can often be achieved at relatively little cost through the adoption of clean production technology. ADB supported the promotion of clean technology including the drafting of the Clean Production Law that was adopted by the National People's Congress in 2002. In addition, ADB has financed centers in Beijing, Tianjin and Chengdu to disseminate clean production technologies. In ADB financed projects, high priority is given to cleaning up the polluted inland waterways by providing assistance to increase the efficiencies of industrial waste water treatment by implementing process audits, adopting recommendations on clean technology, providing advice on pretreatment systems, and making funds available from the pollution levy fund.

G. Legal Framework and Regulatory Enforcement and Monitoring for Environmental Management

Attention to sound environmental management, including natural resources and water conservation, is a comparatively recent concern in the PRC. To help build the necessary capacity to strengthen the legal framework, ADB supported the training of staff of the Environment Protection Commission of the National People's Congress and the drafting and revising some of the environmental laws. In May 1996, the National People's Congress amended the 1984 Water Pollution Law to address many of the weaknesses of the old law, and reflect the revisions to the Water Pollution Prevention and Control Law recommended under ADB's TA: *Legislative Planning and Procedures for the Protection of the Environment*.

ADB helped to upgrade the knowledge and skills of provincial legislative drafters in the review, amendment, and formulation of local legislation related to the protection and conservation of the environment and natural resources. ADB is supporting improved environmental management through (i) an analysis of the most suitable market-based instruments; and (ii) the formulation of a program for their adoption, specifically in the water and energy sectors. In addition, ADB provided assistance in environmental management by improving the institutional capacity of SEPA, and the local and provincial environmental protection bureaus to strengthen environmental standards and to enforce environmental laws and policies. The environmental standards are now similar to international practice. A remaining major issue is compliance and enforcement.

H. Cost Recovery and Tariff Reform

Historically, water tariffs were low in the PRC, even lower than water production costs. Although tariffs increased by 18% per annum from 1986 to 1998, they are still not high enough to ensure the financial viability of water companies. Similarly, wastewater tariffs have also been below the costs to operate and maintain the facilities. ADB financed projects have been pursuing to support the Government's ongoing economic and enterprise reform programs that require that all wastewater and water supply projects be financially sustainable and capable of cost recovery. Under Government policy directives to promote the market economy, the water supply and wastewater companies need to improve their cost recovery capability. The ADB is actively encouraging this transition in its policy dialogue and lending operations. Having appropriate mechanisms for tariff setting is a critical factor in attracting the needed investment to the sector, ending the reliance of water supply companies on governments subsidies and providing incentives to users to conserve water resources.

Tariff policies also have a key role to play in managing risk when private sector participation (PSP) is introduced. This is particularly true when a private sector partner assumes direct responsibility for the water and wastewater tariffs but it is also the case when the Municipal Government and the water supply companies (WSC) retain responsibility for the tariffs. In either case, revenue risk is minimized if clear policies requiring tariffs that recover the full cost of the water supply and wastewater treatment exist while establishing and independent and transparent regulatory process to safeguard the customer from excessive profit taking. Important policy milestones related to water and wastewater tariffs include (i) the "Regulation on Management of Pricing of Urban Water Supply" (1998), which was the first national guidelines on water tariffs, which include the principle of full cost recovery through tariffs; and (ii) the Circular on Strengthening the Collection of Wastewater Treatment Tariffs" which came into effect in 1999. The ability to attract private sector partners in PRC water and wastewater sectors will depend on the future prospects for cost recovery including a reasonable return on capital

investment. ADB's two water tariff study TAs⁵ implemented over a four-year period has contributed significantly to water tariff reforms in the PRC. Also, ADB's Chengdu Water Supply project, the first internationally bid BOT water supply project in the PRC, contributed to the reform of the water sector. ADB's wastewater tariff study TA⁶ implemented between 2002 and 2003 also contributed to Government's initiative to wastewater tariff reforms.

The *Water Tariff Study* TA studied the water tariffs and developed appropriate tariff mechanisms that will ensure full cost recovery. A major output of the TA was the preparation of the National Guidelines on Water Tariffs (NGWT), which was subsequently promulgated by the National Development and Reform Commission (NDRC)⁷ and the Ministry of Construction (MOC) in September 1998. Major features in the NGWT that reflect specific recommendations of the TA include: (i) selecting a tariff structure based on local conditions and priorities, (ii) considering a two-part tariff with a volumetric charge and fixed demand charge, (iii) adopting full cost recovery as the main objective in setting and approving tariff levels, (iv) use of the public hearings mechanism to disseminate tariff increase plans to the public and obtain their feedback; and (v) adopting a simplified process for tariff regulation, requiring evaluation and approval at the local municipal government level and supported by review and monitoring at the provincial and national level. The NGWT improved the long-term financial viability of the WSCs, and provide for operations and maintenance and service expansion, which in turn would help increase PSP in the water sector.

The *Water Tariff Study II* TA focused on providing assistance to the Government in developing institutional and methodological capacities to implement the NGWT. The TA assisted in preparing the draft local implementing regulations of the NGWT for Zhangjiakou, Fuzhou and Chengdu. Enactment of a local tariff regulation provides a legal basis for regulating water tariffs and ensures transparency and efficiency. The Zhangjiakou Implementation Regulations (ZIR) were approved by the Zhangjiakou Municipal Government in September 2000. The ZIR was the first local water tariff regulation under the NGWT. The Chengdu Implementation Regulation was issued in 2002. Public hearing meetings are a mandatory requirement of the NGWT. The TA advocated the use of hearings to obtain the views of the public on water supply and to promote public understanding of WSCs, policies and efforts to develop improved water supply services. Based on the first public hearing meeting, Zhangjiakou increased its water tariffs by 75%. The NGWT also promotes social programs targeted at the urban poor to mitigate the impact of tariff adjustments. The ZIR includes cash rebates for poor families, laid-off workers and social aid families under the administration of the Labor Union and Civil Affairs Bureau. The NGWT also requires the tariff structure to include lifeline tariffs for the poor. The TA recommendations including the achievements in Zhangjiakou have been acknowledged by the State Council as a good example for tariff reforms. NDRC issued a Notice to local governments nationwide indicating that the Zhangjiakou water tariff reforms were recognized as a good example for undertaking tariff reforms required by the NGWT. Upon completion of the study, NDRC, Ministry of Finance (MOF), MOC, Ministry of Water Resources (MWR) and the State Environmental Protection Administration (SEPA) officially issued a notice on further strengthening urban water tariff reforms on 1 April 2002, followed by a nation-wide video conference to discuss the Zhangjiakou experience on water tariff reforms on 9 April 2002.

⁵ ADB. 1997. *Technical Assistance to the People's Republic of China for Water Tariff Study*. Manila. ADB. 1999. *Technical Assistance to the People's Republic of China for Water Tariff Study II*. Manila.

⁶ ADB. 2001. *Technical Assistance to the People's Republic of China for National Guidelines on Urban Wastewater Tariffs and Management Study*. Manila

⁷ Previously State Development and Planning Commission.

The *Wastewater Tariff TA* was aimed to improve urban wastewater management and enable investment in wastewater infrastructure by developing national guidelines for wastewater tariffs, including tariff calculation methodologies that will allow for full cost recovery taking into consideration affordability and social constraints. The major output of the TA was a detailed draft National Guidelines for Urban Wastewater Tariffs (NGWWT), which comprises a short and concise main text of 37 clauses, and five annexes covering (i) Rationale and Explanation, (ii) Tariff Calculation Methodology, (iii) Model Agreement for Tariff Billing and Collection, (iv) Penalty and Administrative Remedies for Non-payment, and (v) Model Contract for Industrial Discharge to Sewer Network. The TA's recommendations on wastewater tariff policies, objectives and structure were supported by MOC, who indicated their intention to use the recommendations in preparing the draft NGWWT for submission to the PRC State Council for approval. The TA also recommended options for encouraging multichannel investment, such as private sector participation, in urban wastewater management.

I. Rural Water Supply and Sanitation

In line with the Government's development strategy in the next 5-10 years to promote pro-poor economic growth by enabling the poor to have greater access to opportunities and benefits of economic prosperity, improving the access to safe drinking water and sanitation is a key objective of the PRC's 10th Five-Year Plan (2001-2005). ADB is providing technical assistance to support the Government's initiative to achieve the goals of the PRC's Outline for Poverty Alleviation and Development of China's Rural Areas (2001-2010). The purpose of the TA, which under implementation, is to help the Government prepare pro-poor rural water supply and sanitation policies, and a strategic investment framework for integrated rural water supply and sanitation, focused on defining viable models for financing sustainable pro-poor rural water supply and sanitation systems. The output of the TA will help formulate the 11th Five-Year Plan by developing the medium term (2006-2010) rural water supply and sanitation sector investment plan and an outline rural water supply and sanitation strategy to achieve related Millennium Development Goals in the long-term (2006-2015).

J. Private Sector Participation

ADB played a leading role in promoting private sector involvement in the PRC's water supply sector. In October 1996, an ADB-sponsored seminar in Beijing brought together more than 100 senior Government officials, bankers and potential private sector investors to discuss private sector involvement in build-operate-transfer (BOT) water supply projects. As a follow-up to this seminar, ADB approved a technical assistance project to help the Government prepare the first pilot BOT water supply project to be awarded on the basis of a transparent international competitive bidding. The objectives of the technical assistance were to build the capacity of government agencies involved in BOT projects in water supply by providing assistance in the bidding and negotiation process. The technical assistance also helped to prepare model project documents to be used for future BOT water supply projects in the PRC. The Chengdu No. 6 Water Supply Plant resulted from this process. Five prospective bidders were short listed to provide proposals to establish a 400,000 cubic meters per day water treatment plant in the city of Chengdu, and the Vivendi/Marubeni consortium, the first-ranked bidder, was awarded with the bid. ADB provided a \$26.5 million loan and a complementary loan of \$21.5 million to finance the project. Construction was completed in 2001 and the plant began commercial operations in February 2002.

The Chengdu Project achieved several notable firsts: (i) it was the first urban water supply BOT project awarded under an open bidding system; (ii) it was the first official BOT water supply

project to reach financial close in the PRC; (iii) it was the first major BOT water supply project in which the sponsors and lenders took a municipal risk; (iv) it was the first PRC project financing in which European Investment Bank was involved; (v) it was the only PRC project financing to achieve financial close in 1999; and (vi) it made use of an efficient new French technology which enabled the consortium to bid the lowest tariff. This project has received three international awards for excellence. ADB is now actively pursuing other private sector investment opportunities related to water supply and wastewater treatment.

ADB also provided support to the Government through a recently completed TA to strengthen policy reform on the use of market-based instruments in enhancing private sector partnership in public utilities focusing on water supply and wastewater treatment.⁸ The Government is considering using market instruments to improve investment and management efficiency in the public utility industries. The Regulation for Chartered Operation in Urban Infrastructure Facilities (Regulation) was issued in May 2004. The Regulation outlines the principles and procedures for regulating chartered operations involved in urban infrastructure facilities, defines the qualifications of a concessionaire, outlines the contents of a concession agreement, and defines responsibilities of the concession granting agency and the concessionaire. The outputs of the TA included (i) an analysis of the issues that need to be resolved to attract private sector investment in the PRC from a perspective of international best practices and recommendations on how these could be addressed in the PRC context; (ii) a study of the Government regulatory framework in the water sector; and (iii) comments on the Regulation and recommendations for amendments to the Regulation.

IV. Who Benefits from ADB Water Supply Projects?

ADB's assistance for wastewater, water supply, and water resources management sectors is designed to benefit people who drink clean water or who are adversely affected by polluted water. So far ADB's projects have focused on urban areas - Dalian, Wenzhou, Tangshan, Fuzhou, Shanghai, Harbin, Wuhan, the Lake Chao Basin and smaller municipalities in Hebei Province. In total about 56 million people will benefit from these projects. ADB's activities have resulted in more rational pricing of water, major increases in water tariffs, introduction of wastewater tariffs, implementation of commercial principles, improved environmental management and related fees, formulation of effluent standards and development of regulatory aspects, and the introduction of private sector investment in the water sector. ADB is also assisting the Government to design and implement market-based instruments for water quality management and establish dynamic water quality monitoring capabilities. These are fundamental improvements that will help make the water and wastewater sectors financially and operationally sustainable. Assistance in rural water supply and sanitation is starting. The long-term objective is to support the Government in providing safe and sustainable water supply, and improving sanitation, health and hygiene behavior in the rural areas.

V. What Water Supply and Wastewater Treatment Projects Has ADB Supported in the PRC?

ADB has provided loans for water resource management and supply in Dalian City, Wenzhou City in Zhejiang Province, Fuzhou City in Fujian Province, Harbin in Heilongjiang Province and Chengdu in Sichuan Province. ADB has also provided a loan to help reduce pollution and restore the water quality in Suzhou Creek and its tributaries in Shanghai City, in Wuhan City, Tianjin and in Hebei Province. Several of ADB's urban environment projects have financed

⁸ ADB. 2003. *Technical Assistance to the People's Republic of China for Policy Reform Support*. Manila.

wastewater treatment components (e.g., Hefei, Qingdao, Tangshan). These loans were complemented by 36 TAs with a total amount about \$22.6 million.

In 2002, ADB approved \$35 million to China Water Utilities Group, a special purpose investment company to be established by the China Water Company Limited in Shanghai for the Water Infrastructure Development Facility. Due to changes in the shareholding structure of the China Water Company Limited and regulatory changes in the PRC where water distribution in small cities was open to the private sector in 2003, the China Water Company decided not to invest in the sector through the special purpose investment company but to invest directly in small-scale projects in the water supply and wastewater sector in the PRC. ADB is considering the renewed application for funding assistance from China Water Company Limited.

Item	LN No.	Project Name	Amount (\$ million)	Approval Date
1	1313	Dalian Water Supply	160.00	20-Sep-94
2	1490	Anhui Environmental Improvement Project for Municipal Wastewater	28.00	26-Nov-96
3	1544	Zhejiang-Shanxi Water Supply Project (Phase I)	100.00	24-Sep-97
4	1636	Fuzhou Water Supply and Wastewater Treatment	102.00	30-Sep-98
5	1692	Suzhou Creek Rehabilitation	300.00	29-Jun-99
6	1669	Chengdu Generale des Eaux-Marubeni (GEM) Waterworks(Chengdu Water Supply Project)	26.50	11-Feb-99
7	1797	Tianjin Wastewater Treatment	130.00	11-Dec-00
8	1905	Water Infrastructure Development Facility	35.00	02-July-02
9	1985	Hebei Wastewater Management	82.36	20-Dec-02
10	1995	Harbin Water Supply	100.00	11-Mar-03
11	1996	Wuhan Wastewater Management	83.00	25-Apr-03
12	2175	Jilin Water Supply and Sewerage Development Project	100.00	18-Jul-05
13	2176	Fuzhou Environmental Improvement Project	55.80	29-Jul-05
Total			1,302.66	

Item	TA NO.	TA Project	Amount (\$)	Approval Date
1	987	Institutional Strengthening of the National Environmental Protection	340,000	10-Jun-88
2	1145	Beijing-Tianjin Water Resources Study	550,000	17-Apr-89
3	1681	Beijing Region Water Resources Management	256,000	30-Mar-92
4	1835	Haihe Basin Environmental Management and Planning Study	1,240,000	31-Dec-92
5	1852	Dalian Water Supply	100,000	10-Mar-93
6	2187	Anhui Municipal Wastewater Treatment	283,000	19-Oct-94
7	2504	Seminar on BOT in the Water Supply Sector	100,000	22-Dec-95
8	2511	Zhejiang-Shanxi Water Conservancy	1,000,000	26-Dec-95
9	2726	Water Quality Management Planning for Suzhou Creek	600,000	23-Dec-96
		Water Quality Management Planning for Suzhou Creek (Supply)	400,000	13-Feb-98
10	2751	Capacity Building of Wastewater Treatment Operations in Anhui Province	400,000	27-Jan-97
11	2770	Fuzhou Water Supply and Wastewater Treatment	598,000	14-Mar-97
12	2773	Water Supply Tariff Study	600,000	24-Mar-97
13	2804	Build-Operate-Transfer (BOT) Chengdu Water Supply	600,000	2-Jun-97

14	3049	Zhejiang-Shanxi Water Supply (Phase II)	540,000	21-Jul-98
15	3095	Hai River Basin Wastewater Management and Pollution Control	570,000	10-Nov-98
16	3211	Improving Environmental Management in Suzhou Creek	840,000	29-Jun-99
17	3215	Hielongjiang Water Supply	1,000,000	1-Jul-99
18	3216	Tianjin Wastewater Treatment and Water Resources Protection	800,000	2-Jul-99
19	3250	Water Tariff Study II	950,000	3-Sep-99
20	3488	Hebei Province Wastewater Treatment	850,000	30-Aug-00
21	3571	Harbin Water Supply	720,000	12-Dec-00
22	3638	Wuhan Wastewater Treatment	500,000	19-Mar-01
		Wuhan Wastewater Treatment (Supplementary)	199,000	1-Mar-02
23	3749	National Guidelines for Urban Wastewater Tariffs and Management Study	700,000	25-Oct-01
24	3863	Mudanjiang Water Supply	150,000	15-May-02
25	3891	Study on Control and Management of Non-Point Source Pollution	600,000	26-Jun-02
26	3963	Study of Carrying Capacity of Water Resources	600,000	4-Nov-02
27	4014	Fuzhou Environmental Improvement Project	600,000	5-Dec-02
28	4061	Songhua River Basin Water Quality and Pollution Control Management	1,000,000	19-Dec-02
29	4215	Safe Drinking Water and Sanitation for the Rural Poor	400,000	12-Nov-03
30	4223	Shandong Hai River Basin Pollution Control	600,000	23-Nov-03
31	4227	Jilin Water Supply and Sewerage Development	650,000	26-Nov-03
32	4233	Henan Wastewater Management	800,000	03-Dec-03
33	4335	Town-Based Urbanization Strategy Study	750,000	06-May-04
34	4385	Guangxi Nanning Urban Infrastructure Development	560,000	03-Sep-04
35	4436	Wuhan Waste Water and Stormworks Management Project	700,000	18-Nov-04
36	4447	Evaluation of Environmental Policy and Investment for Water Pollution Control in the Huai River Basin and the Taihu Lake Basin	500,000	25-Nov-04
37	4586	Guiyang Integrated Water Resources Management Project	800,000	16-May-05
38	4604	Nanjing Water Utility Long Term Capital Finance in Commercial Markets	440,000	28-Jun-05
39	4617	Nanjing Qinghuai River Environmental Improvement Project	600,000	19-Jul-05
Total			24,486,000	

VI. What Are ADB's Plans for Future Investment in the Water and Wastewater Sectors?

ADB plans to provide financing for another 11 projects in the public sector during 2006-2008 amounting to \$1,250 million. ADB will also provide 13 TAs in the amount of about \$7.3 million. Apart from the public sector operations, private sector investments in water supply and wastewater treatment are being pursued. ADB will continue to promote private sector investment in the water and wastewater sectors. As an example, ADB's public sector and private sector departments are working closely with the Nanjing Municipal Government to identify a public-private-partnership component for the Nanjing Qin River and Huai River Rehabilitation Project that is planned for a 2007 loan (No. 8 in the table below).

No.	Proposed Loan	Proposed Amount (\$ million)	Expected Approval Year
1	Henan Hai River Wastewater Treatment Project		
2	Shandong Hai River Basin Pollution Control	100	2005
3	Guizhou Integrated Water Resources Development	150	2006
4	Henan Hai River Wastewater Treatment Project	100	2006
5	Guangxi Nanning Urban Infrastructure Development	100	2006
6	Wuhan Wastewater & Stormworks Management	100	2006
7	Nanjing Qinhuai River Environmental Improvement	100	2007
8	Hefei Urban Environment Improvement	150	2007
9	Ecosystem Development and Environment Protection of Baiyangdian Lake	100	2007
10	Water Resources Protection and Management	100	2008
11	Urban Infrastructure I	100	2008
12	Urban Infrastructure II	100	2008
13	Integrated Urban Development	150	2008
Total			

No.	TA Proposal	Proposed Amount (\$)	Expected Approval Year
1	Hefei Urban Environment Improvement	750,000	2005
2	Nanjing Qinhuai River Environmental Improvement	600,000	2005
3	Ecosystem Development and Environment Protection of Baiyangdian Lake	500,000	2006
4	Rural Water Resources Management Strategy and Institutional Reform	350,000	2006
5	Comprehensive Agriculture and Water Resources Protection and Management	800,000	2006
6	Urban Infrastructure I and II	800,000	2006
7	Integrated Urban Development	500,000	2006
8	Reform of the Water and Soil Conservation Legislation II	400,000	2007
9	Rural Water Supply Strategy	600,000	2007
10	Rural Water Supply and Sanitation	500,000	2007

11	Urban Infrastructure III	500,000	2008
12	Rural Water Supply and Sanitation II	500,000	2008
13	Integrated Urban Development II	500,000	2008
Total			

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