

Project Name CHINA-Guangdong Pearl River Delta...
Urban Environment Project

Region East Asia and Pacific Region

Sector Sewerage (70%); Solid waste management
(20%); Sub-national
government administration (10%)

Project ID P075728

Borrower(s) PEOPLE'S REPUBLIC OF CHINA

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Environment Category A

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1. Country and Sector Background

Background. The Pearl River Delta (PRD) is one of the most complex urban systems in Asia; it holds over 40 million people in 25 administratively-defined cities and three counties in Guangdong Province, and in two Special Administrative Regions (Hong Kong and Macau). In Guangdong Province there are 534 towns, townships and sub-municipal districts which, after more than 15 years of rapid decentralization, have significant functional responsibilities for the delivery of public services. The PRD has ranked at or near the top nationwide in economic growth rates over the past decade (averaging 14.7% per annum during 1990-2000), mostly due to large inflows of direct foreign investment initially in low value-added manufacturing, and more recently in higher value-added manufacturing and, in a few cities, in services. Much of the growth has been powered by large inflows of low-cost migrant workers from peripheral areas in Guangdong and from poor provinces. Many parts of the PRD are largely devoted to export processing.

The Delta is also complex geographically. There are three major branches of the Pearl River (Zhu Jiang) which join at the city of Guangzhou, the political, economic and cultural hub of the PRD. The Pearl River is China's third longest river, and is second only to the Yangtze in terms of annual average flow. The Pearl River discharges into the South China Sea through eight principal tributaries. The close proximity of these tributaries, the flat terrain of the delta, the very large number of canals and streams interconnecting tributaries, and tidal flows and surges

makes an accurate hydrological definition of "sub-basins" with the PRD very difficult.

Sector Issues. The high economic growth in the PRD has come at a heavy environmental cost. Investment in environmental protection has not kept pace with the rapid economic advances, which is evident in the serious deterioration in river water quality during the period. Today many of the reaches of the Pearl River, especially in the vicinity of Guangzhou are at Class V or worse, and therefore unfit as a drinking water source. Except for wastewater collection and simple landfills for solid wastes, most cities in the PRD have limited experience with planning, designing, financing, managing, and operating wastewater and solid waste treatment facilities. This contributes to the differing extent and quality of infrastructure services between towns. Many cities in the PRD face potential planning and management capacity gaps.

Domestic and industrial wastewater discharges, urban storm water runoff, and non-point source pollution from agricultural and livestock farm run-off, are considered the main pollution sources within the PRD. Generally, collected municipal wastewater is discharged to the river systems without treatment, except in the larger municipalities of Guangzhou, Shenzhen and Zhuhai, where only a portion of the wastewater is treated. Environmentally safe disposal of sludge from wastewater treatment plants is only just beginning in the PRD, with a first plant under construction to serve Guangzhou city. Treatment of sludge from the expanding wastewater treatment plant capacity now being installed, will present a growing challenge to PRD cities. This deteriorating situation poses a serious threat to drinking water sources, including the drinking water supply to Hong Kong. It also renders the river system unsuitable for irrigation, aquaculture, and potential recreational uses. The government strategy has been to move drinking water intakes upstream to avoid contaminated supplies. This approach is not sustainable.

Municipal solid waste collection is well-organized on a neighborhood basis. However, the capacity to treat and dispose of solid waste varies widely among cities in the PRD, as the transfer, treatment and disposal of solid wastes are not well developed except in the larger urban centers. Guangzhou has a well organized landfill operation; however, recycling and waste minimization are not practiced in the PRD, except at the informal level. The growing volumes of hazardous wastes present considerable risks to health, surface and ground water sources. Measures are now planned to address this problem in the larger municipalities.

Lack of demand management, and under-pricing of urban services result in a drain on municipal resources, curtailing funds available for other developmental activities. Charges for water supply and wastewater are a fraction of the true cost of providing the services. Aside from a charge for collecting wastes from households to collection points and a recently-introduced garbage fee in Guangzhou, there is no cost recovery for transfer and disposal of garbage. Up to now, the strategy of the Provincial and municipal governments has been to address environment issues on a highly-localized approach.

Some cities in the PRD are facing growing social and human pressures from vulnerable populations. These are people who are at or very close to

levels that trigger formal urban poverty relief for residents entitled to municipal government support (i.e., permanent, nonagricultural registered residents). However, large numbers of PRD's vulnerable population are not eligible for formal support, largely because they do not meet urban residency (hukou) requirements or are not fully employed. While the popular perception is that unemployed factory workers return to their home towns, evidence suggests that a growing number are staying in the PRD and entering informal labor markets. It is this segment of the population--the informal migrants--that are particularly vulnerable, as they are often do not have access to basic environmental infrastructure services, or are provided access at higher prices through intermediaries (e.g., landlords). Ensuring affordable access to services for all segments of the PRD's vulnerable population is becoming a major challenges for cities.

Experience with private sector participation in infrastructure investments and service provision is relatively new in China, but is beginning to take place in the larger cities. In Guangdong province, private sector involvement includes: one concession for a water supply (in Tanzhou); production and transmission of water; wastewater treatment (in Guangzhou); operation of a landfill for Guangzhou with gas extraction and conversion to electricity; and a Build-Operate-Transfer (BOT) operation for a sludge treatment plant for Guangzhou (about to commence). So far, no initiatives have been taken to facilitate entry of private service providers for the distribution of drinking and wastewater collection, where the greatest gains in efficiency and service levels are possible. Considerable opportunities exist for more private sector participation, which could result in greater efficiencies, and greater financial flows to cities in the PRD.

At present, every town builds and manages its own urban utility system and economies of scale and other potential benefits are not being realized.

The recently announced Provincial program of constructing more than 160 wastewater treatment plants to clean up the PRD river system, perpetuates this fragmented approach to planning. But, opportunities exist for cooperation and shared provision of environmental infrastructure services among cities in the PRD. The Guangdong Provincial Government (GPG) and municipalities recognize that regional planning approaches present opportunities for inter-municipal cooperation, jointly managed facilities, reduced costs, and economies of scale for provision of environmental infrastructure. They have not yet, however, addressed the institutional challenges inherent in this approach. The problem is compounded by the lack of a strategic framework at the Provincial, metropolitan and city levels for planning and implementing least-cost priority investments, and policy and institutional reforms. It is imperative that a comprehensive water resource management plan be developed and implemented soon to reduce pollution, and protect drinking water sources.

Guangdong Provincial Government Strategy. The GPG is committed to achieving sustainable development in the PRD and expanding provision of urban environmental services, including use of innovative forms of non-state involvement. It recognizes that regional environmental infrastructure investment will need to be guided by a regional development strategy that is anchored on commitment by the multiple cities and towns in the PRD towards the common goal of economic growth, sound environmental management and fiscal sustainability across PRD as a whole. Guangdong Province, through its provincial Environmental Protection Bureau (EPB), has announced a plan to clean-up the PRD through an eight-year, US\$5 billion program of investments in wastewater treatment facilities. Details of this program are still being developed in consultation with cities, which would consider incorporating the proposals in their wastewater master plans. The program reflects the fragmented approach to infrastructure planning, contains too many treatment plants, is ambitious and costly, and needs further detailed analysis to develop rational and least-cost options, and to achieve economies of scale. The Province is also preparing solid waste master plans for management of municipal and industrial solid waste.

2. Objectives

The project development objective is to improve the quality of the urban environment in key cities in the Pearl River Delta (PRD), by following an integrated regional planning approach, in order to facilitate continued economic and social development.

3. Rationale for Bank's Involvement

Both Guangdong Province and Guangzhou city have been subborrowers from the Bank for major infrastructure projects. So, they know what the Bank offers. They appreciate the saving that have accrued to them by virtue of the Bank's international competitive bidding procedures. Even if almost all contracts go to Chinese suppliers, Bank procedures are recognized as imposing demanding standards of transparency and bidders respond accordingly. It is also recognized that Bank-imposed contract supervision ensures a high standard of compliance with conditions of the contract. Thus risk of political interference is minimized. The Bank is also seen as adding value in its probing of project alternatives to ensure adoption of the most cost-effective option, and in the window it opens on international experience regarding complex project management and matters

of public policy such as cost recovery and institutional arrangements for the delivery of environmental infrastructure services.

What is the valued added of the Bank's support for wastewater and solid waste management in the PRD? As mentioned previously, before the Bank started project preparation, there was a lack of a strategic framework at the Provincial, metropolitan and city levels for planning and implementing least-cost priority investments, and policy and institutional reforms for wastewater services. Now that the strategic framework is being prepared, it can be used to guide future investments and developments in the PRD, through the implementation of the proposed project. This framework will also identify opportunities and benefits of having local governments cooperate in the operation of shared wastewater treatment (and solid waste) facilities. Such cooperation will be piloted under the proposed project, thereby providing a model for cities throughout Guangdong Province and elsewhere in China.

4. Description

The project would support infrastructure investments as well as technical assistance and capacity building at both provincial and city levels, as follows:

(a) Wastewater Management in Guangzhou City, would include increase in the wastewater treatment capacity by about 400,000 m³/day in two plants, construction and rehabilitation of sewage networks to collect wastewater generated, interception of wastewater entering creeks and rivers, and storm water management.

(b) Incentive-based Lending for Inter-Municipal Environmental Infrastructure in PRD Municipalities and Towns, would fund wastewater treatment and solid waste investments for groups of two or more contiguous municipalities or towns willing to plan, construct and manage shared facilities. Candidate towns will be identified by appraisal, along with proposed investments, and institutional arrangements for construction and management of the facilities.

(c) Solid Waste Management in Guangzhou City, would include investments in landfills and/or waste treatment plants for disposing of solid waste in Guangzhou and neighboring towns.

(d) Water Quality Monitoring and Information Systems, would include a range of laboratory and field equipment (including automatic water quality recorders) and development of MIS to measure water quality in rivers in the PRD, and to enhance the capacity of the Provincial Environmental Protection Bureau to improve its efficiency and effectiveness for pollution control.

(e) Technical Assistance and Capacity Building, would include (i) project implementation support for detailed design and construction supervision; (ii) launch of a public awareness campaign to inform citizens about the government's plans to clean up the river system, water quality objectives, and potential benefits and citizen support to detect and report polluters; (iii) strategic studies for urban development, water resource and environment management, wastewater and storm run-off management, agricultural and animal waste management, private-private partnerships in funding and managing environmental infrastructure, and financial policies and instruments for mobilizing long-term resources for environmental investments; and (iv) training in urban development, wastewater, solid waste management and water quality monitoring.

(a) Wastewater Management in Guangzhou City

- (b) Incentive-based Lending for Inter-Municipal Environmental Infrastructure in PRD Towns
- (c) Solid Waste Management in Guangzhou City
- (d) Water Quality Monitoring and Information Systems
- (e) Technical Assistance and Capacity Building

5. Financing

Total (US\$m)

BORROWER \$215.00

IBRD \$200.00

IDA

Total Project Cost \$415.00

6. Implementation

The Guangdong Provincial Finance Bureau is responsible for the overall coordination of the project. The Guangdong Provincial Government Office for World Bank Projects (GPG-PMO), which has been established within the Provincial Finance Bureau, will perform the overall coordination function.

The GPG-PMO has already successfully coordinated implementation of several World Bank-financed projects. Each participating city will set-up its own Project Management Unit (PMO) to oversee preparation and implementation of its component. Guangzhou has already done this. Individual components would be implemented by the respective sector agencies. In Guangzhou City, the wastewater treatment component will be implemented by the Guangzhou Municipal and Gardens Bureau; the solid waste management component will be prepared and implemented by the Guangzhou Solid Waste Management and Treatment Center; and the Guangdong Provincial Environmental Protection Bureau will be responsible for implementation of the water quality monitoring component.

7. Sustainability

The project is expected to be sustainable in three aspects: (a) financially; (b) institutionally; and (c) achievement of development objectives. Financially, tariff reforms would enhance the viability of the wastewater and hazardous waste services. Institutionally, the creation of financial autonomous wastewater companies and a solid waste company and continued technical assistance would strengthen utility management. Finally, the project addresses an issue of high priority to central, provincial and local governments--the vital self-interest in achieving environmental conditions necessary for sustained economic and social growth in the PRD, which constitute a strong motivation to continue implementing the long-term environmental clean-up strategy.

8. Lessons learned from past operations in the country/sector

Since its first loan in 1985, China has borrowed US\$2.2 billion under 22 projects for water supply and wastewater operations (both IDA and IBRD). A 2002 OED Report (China: Review of the Bank's Assistance to the Urban Water Supply and Wastewater Sector, Report No. 24979) rates the outcome of the Bank's assistance moderately satisfactory, its sustainability as likely, and its institutional impact as modest. OED also rates both Bank performance and borrower performance satisfactory. The key lessons learned and recommendations are:

the least-cost analysis of future Bank-financed projects should always include improved incentives and support for demand management of water consumption and treatment;

tariffs of future Bank-financed project should be guided by the level of average incremental costs, which signals future costs;

the recent policy of conditioning future Bank financing on the establishment of autonomous wastewater companies be continued;

future Bank financing should give priority to cities and provinces that are willing to contribute a larger share of planned investments from internal cash generation; and

the next generation of Bank sector projects should include private sector participation where there is political support in favor of private sector participation.

All of these lessons and recommendations have been taken into account in conceptualizing the proposed project. The details on how they will be fully integrated into the final project design and addressed during implementation will be worked out with the Guangdong Provincial PMO and the participating cities during project preparation.

9. Environment Aspects (including any public consultation)

Issues :

The main environment issues that will be addressed during preparation include:

(a) Industrial, and Non-Point Source Pollution. Treatment of municipal wastewater alone will not meet the objective of improving water quality in the PRD river system, if complementary action is not taken to address pollution from industry and non-point sources. Industrial pollution control will be addressed through a parallel program of GPG under the Industrial Pollution Control Action Plan, which will target the worst polluters from among about 165 industries. However, the pollution load contribution from the small town and village industrial enterprises (TVIE), of which there are many, is not strictly regulated yet. The challenge for the project will be to develop fail safe measures to capture and treat this source of pollution. Another area is the wastewater from agriculture and livestock farming, the impacts of which are not known. The project will include a study of this problem and it is expected that a regulatory framework to control this source of pollution will be formulated. The project will also look at the impact of water pollution on the aquaculture industry in the PRD, and ways this problem can be mitigated.

(b) Levels of Wastewater Treatment. The government's recommendations are for full secondary treatment, without regard for the receiving water

quality, which is often an unaffordable and unnecessary solution. Options for least-cost wastewater treatment would be examined, due to the high cost of secondary treatment, and the prevailing low tariffs, which grossly under-price services. Options to be considered include: (i) interception, transmission downstream of Guangzhou City, and discharge to the river, following preliminary treatment, if adequate dilution and dispersion can be achieved; and (ii) a range of other levels of secondary treatment.

(c) Treatment and Disposal of Sludge. The volumes of sludge generated with the installation of increased treatment capacity will present challenges to PRD cities. Treatment and disposal of sludge in an environmentally-safe manner will be developed as an integral part of the project. It has been reported that Guangzhou City is about to contract a BOT operation for sludge treatment for the city. Whether the capacity is adequate to treat the sludge generated from the proposed 400,000 m³/day plant under the project is not known at this stage. The problem would need to be addressed for Guangzhou, and any other cities that would decide to participate in the project.

(d) Tunnel Spoil. If the tunneling option is adopted, there will be large quantities of excavated material that would need to be safely disposed. The EIA will address this issue and specify mitigation measures.

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Note: This is information on an evolving project. Certain components may not be necessarily included in the final project.

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