

Introduction

Anand Chiplunkar, Kallidaikurichi Seetharam,
and Cheon Kheong Tan¹

Challenges in the Water Sector

The water problems in Asia's cities are similar. These include sources and uses of raw water, the large proportion of water loss in distribution networks, intermittent supply, and the quality of tap water. In some cities, the excessive use of groundwater resources has caused serious environmental problems, including rapid depletion of groundwater, deterioration of water quality, and land subsidence. Many cities suffer from inadequate sewerage networks and wastewater treatment systems while a large majority still depends on septic tanks and other on-site sanitation facilities. As a result, pollution loads in freshwater bodies and groundwater sources have increased substantially.

For several reasons, cities have to struggle to provide clean and reliable water supply to their residents. These include the physical scarcity of water, lack of investment funds in the water sector, unwillingness of authorities to charge the poor for their water consumption, and the lack of capacity of service providers in the public

Box 1 Common Water Utility Challenges

- Only a portion of the urban population is covered by the water utility.
- Rapid urbanization results in inadequate water supply.
- Water supply provided by the utility is intermittent.
- Nonrevenue water is high.
- Water is often not potable.
- Asset management is poor or lacking.
- Low tariffs hamper water supply connections to the poor.

Source: ADB (2007).

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Mukand Singh Babel and Aldrin A. Rivas⁴

Introduction

Bangkok, the capital of Thailand, is situated on the flat deltaic plain of the Chao Phraya River, which extends to the Gulf of Thailand. The Bangkok metropolis is located at latitude 13.45° North and longitude 100.28° East, with a total area of 1,569 square kilometers (km²) and a mean elevation of 2.31 meters (m) above mean sea level (BMA and UNEP 2004). Approximately 60% of the city land area is built-up, while 29% is utilized for agriculture, located largely in the periphery of the metropolis (Figure 1). Areas used for aquaculture activities cover around 5% while water bodies account for about 1%, with other land use types covering the rest.

The metropolis has a registered population of approximately 5,711,000 in 2008, an increase of less than 1% from a decade ago, indicating a low growth rate (DOPA 2009). The actual population of Bangkok may not be known exactly as many people commute to work in Bangkok or live in the city without registration. Estimates by the Bangkok Metropolitan Administration (BMA) showed that in 2007, the non-registered population of Bangkok was 57% of total registered population (Panya Consultants 2008). If this proportion is used for 2008, the total 2008 population of Bangkok was approximately 8.96 million. For the greater Bangkok area, with an approximate size of 7,760 km² covering the five adjacent provinces of Samut Prakan, Nonthaburi, Nakhon Pathom, Pathumthani, and Samut Sakhon, the registered population in 2008 was around 10.2 million.

Bangkok has a monsoon type of climate, which is classified into three main seasons: rainy (May–October), cool (November–January), and hot (February–April). Its average annual rainfall is approximately 1,500 millimeters (mm) (Thai Meteorological Department n. d.). About 25% occurs in September. Rainfall is minimal to negligible in the dry months of November to April.

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K. L. L. Premanath and Mahesh Vilas Harhare³³

Introduction

Colombo is located on the western coast of Sri Lanka and is the country's largest city. It was originally a small seaport used by Moor, Arab, Persian, and Chinese sailing vessels. Sri Lanka was, over time, ruled by the Portuguese, Dutch, and British. It became an independent nation in 1948. Being its commercial capital, Colombo contributes significantly to the Sri Lankan economy. There is a high concentration of manufacturing activities in Colombo.

Based on Census 2001, the total population of the Western Province (comprising the districts of Colombo, Gampaha, and Kalutara) was 5.38 million, with the urban population having a 30% share (Department of Census and Statistics 2006). The population of Colombo city grew from 587,647 in 1981 to 637,865 in 2001, translating to a compounded annual growth rate (CAGR) of 0.41%. The Colombo Development

Table 1 Key Statistics of Greater Colombo Area

Province	Western	Area (2008)	1,197 km ²
GC area population (2008)	3,765,000	Average household size (2008)	5
Population density (2008)	3,145 persons per km ²		
Year	2001	2006	2007
Sri Lanka population	18.7 million	19.8 million	20.0 million
GC area population	2.7 million	3.25 million	3.3 million
GC area population as a % of Sri Lanka population	14.4%	16.4%	16.5%

GC = Greater Colombo, km² = square kilometer.

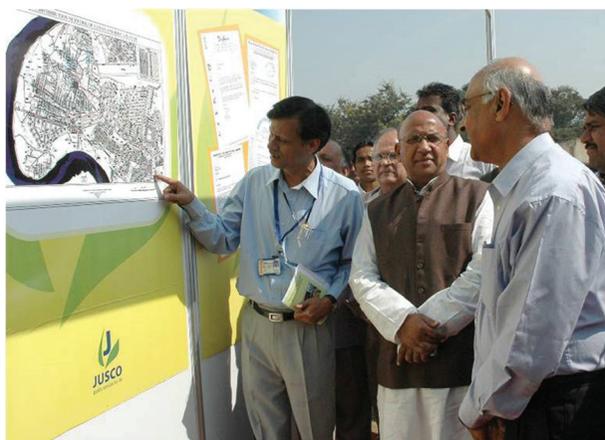
Source: National Water Supply and Drainage Board, Sri Lanka.

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Anand Madhavan and Supriya Sahai³⁹

Introduction

Jamshedpur is located in the East Singhbhum district of Jharkhand, India. It is one of the country's oldest and largest industrial towns. The city owes its origins to Jamset Nusserwan Tata's vision of setting up India's first private iron and steel company, Tata Iron and Steel Company (currently known as Tata Steel). His vision was realized when a little-known region formerly called Sakchi, at the confluence of the Subarnarekha and Kharkai rivers, was chosen for setting up the steel plant of the new company in 1907. The town that came into existence around the steel plant was named Jamshedpur in 1919 by Lord Chelmsford in honor of the late Jamsetji Tata, who passed away in 1904.



The general manager of JUSCO explains a planned water system to a local government official.

Source: Photo courtesy of Jamshedpur Utilities and Services Company Limited.

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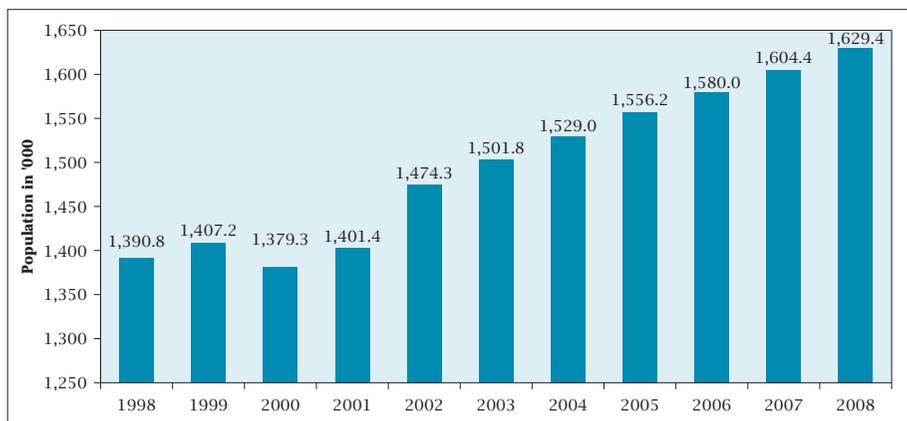
Singaravelloo Kuppusamy and Siew Hooi Tan⁵¹

Introduction

Water supply in Kuala Lumpur is closely linked to Selangor state through one water utility company that serves both states. This is because the city of Kuala Lumpur has close historical origin from Selangor, being its capital from 1880 to 1978. In 1974, Kuala Lumpur became a federal territory under the federal government.

Kuala Lumpur is not large at 242 square kilometers (km²) but more than half is built up, resulting in a high population density of 6,678 persons per km² that is almost 80 times that of the national average in 2008. The city population was then 1.6 million (Figure 1) and by 2020, its population is expected to be 2.2 million (DBKL 2004). Higher population growth means increasing future demand for water. Kuala Lumpur is entirely dependent on Selangor for its water supply.

Figure 1 Population in Kuala Lumpur, 1998–2008



Source: Department of Statistics, Government of Malaysia (various years).

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Juan Miguel Luz and Maria Lynn Paladio-Melosantos⁶⁶

Introduction

Metro Manila is the smallest region of the Philippines in terms of land area, covering 636 square kilometers (km²), or 0.21% of the country's total land area.⁶⁷ It is the most populated region, with over 11.5 million inhabitants or 13% of the country's total population. The population density is estimated at over 18,000 persons per km² (Figure 1), making it one of the most densely populated cities in the world (NSO 2008). The proportion of its informal settlers is estimated to be as high as 40% of the total population (Osakaya 2002).

Topographically, the region is divided into four physiographic elements (Figure 2):

- (i) a central plateau, 5–70 meters (m) above sea level, occupying 62% of the land area;
- (ii) the coastal lowland bordering Manila Bay to the west;
- (iii) the Marikina Valley to the northeast, bordered by the Sierra Madre Mountains; and
- (iv) the lakeshore lowland bounded by Laguna de Bay (also called Laguna Lake) to the east and southeast.

Metro Manila is drained by two rivers, the Marikina and Pasig rivers. The Marikina River drains 506 km² of basin area down to the Pasig River and finally to the Manila Bay during normal river discharge. A network of 290 kilometers (km) of natural *esteros* (estuarial network of narrow tidal creeks) and man-made canals, fed by approximately 50 km of primary drains and 1,200 km of secondary drains serve as the storm water management system for Metro Manila except those areas that directly discharge water to the Pasig River or the Manila Bay (ADB 2010). Laguna de Bay serves as a natural detention reservoir to 21 subbasins, including Metro Manila's basins (Felizardo 2006).

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⁶⁷ Metropolitan Manila (Metro Manila) is the national capital region of the Philippines. It is composed of 16 cities and one municipality.

Asit K. Biswas and Cecilia Tortajada¹³⁵

Water Supply of Phnom Penh: An Example of Good Governance

Introduction

Cambodia is generally well endowed with water resources. It has a high annual rainfall (up to about 3,000 millimeters [mm] in the highlands), three major rivers (Mekong, Bassac, and Tonle Sap) with many tributaries, and excellent sources of groundwater both in terms of quantity and quality. Until the late 1960s, urban water services in Phnom Penh were similar to what then existed in many of its neighboring countries. Many of the residents of Phnom Penh had an uninterrupted 24-hour water supply of reasonable quality water.

The situation, however, changed dramatically after the late 1960s due to considerable political turmoil, and this condition continued unabated for the next 2 decades. The situation worsened during the 4-year rule of the Khmer Rouge, which captured Phnom Penh in 1975. The Khmer Rouge attempted to make Cambodia a classless rural society by forcing people to work in agricultural communes. Its strong ideology included isolating the country from all types of external influences.

The social, political, economic, and institutional turmoil took its toll on all of Cambodia's development sectors during the decades of the 1970s and the 1980s. Urban water management was not an exception. All forms of social services in the country—from education to health—became totally dysfunctional, and all urban infrastructures were grossly neglected during these 2 decades. There were no new

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Miao Chang, Xin Tian, and Dongwei Li ¹³⁷

Introduction

As the first special economic zone (SEZ) officially approved by the Government of the People's Republic of China (PRC), Shenzhen is not only leading in the reform of water management in the PRC but also in the country's urban water industry in the direction of marketization.

The Shenzhen Municipal Water Affairs Bureau (SZMWAB) was the first authority to be established in the PRC to take charge of all water management affairs of a city.¹³⁸ As an SEZ, Shenzhen is entitled to enact local laws and regulations, thus permitting a relatively complete legal system needed for water management to be established. Meanwhile, water sector reform in Shenzhen resulted in a high degree of separation between the government and enterprises. The Shenzhen Water Group (SZWG), which is a major provider of water supply and wastewater services and has an excellent reputation in the PRC's water sector, completed a reform of its system in 2004. It became a large, joint venture among the government, Veolia Water, and Beijing Capital Group. Veolia Water and Beijing Capital Group provided CNY3.31 billion¹³⁹ (\$400 million) in funding to acquire a 45% equity stake in SZWG. This was the largest merger and acquisition in the PRC's water sector and the second largest in the world at that time (Fu, Chang, and Zhong 2008, 104). Shenzhen's water management and market operations are thus representative of reform in the PRC and have a strong guiding significance for other cities.

¹³⁷ Chang is associate professor, Tian is assistant researcher, and Li is also assistant researcher, all at the Division of Environmental Management and Policy, School of Environment, Tsinghua University, People's Republic of China.

¹³⁸ Before 2009, the SZMWAB was known as the Shenzhen Water Resource Bureau (SZWRB).

¹³⁹ Currency conversion: \$1 = CNY8.27.

CHAPTER IX Singapore

Cheon Kheong Tan¹⁴⁵

Introduction

Singapore is a city state in Asia, with a population of about 5 million in 2008 and a land area of 710 square kilometers (Department of Statistics 2009a, 9). It is located in the tropics where rainfall is abundant. The country receives about 2,400 millimeters (mm) of rainfall annually, with rainy days accounting for about 50% of a calendar year (Department of Statistics 2009a, 17). However, it has limited land for catchments to collect and store sufficient rainwater for its domestic and industrial needs. Together with the lack of groundwater, Singapore faced the enormous challenge of water scarcity and vulnerability as its population grew rapidly, after it obtained independence in 1965.

However, Singapore adopted an integrated and innovative approach to water management, which, together with careful planning and hard work over more than 40 years, enabled it to overcome water supply constraints and attain sustainable and cost-effective water management solutions. Today, its entire population enjoys access to modern sanitation and high-quality piped water on a 24-hour basis daily.

Singapore's ability to manage its water supply, using it wisely to support its economic activities to become a city with a high standard of living, is impressive. Since 2003, Singapore succeeded in using innovation to enlarge its water supply. It turned wastewater into high-grade reclaimed water and produced the end product on a large scale to enhance self-sufficiency in water. Wastewater was renamed "used water" in Singapore, to reflect its value for reuse. The country's achievement in water reuse has made it stand out in the industry. Some countries that struggle with water scarcity and pollution have begun to look to Singapore's experience for solutions.

In recognition of its excellence in water management, the Public Utilities Board (PUB), was named the Water Agency of the Year 2006 at the international Global

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CHAPTER
X

Gearing for the Future: A Framework for Success

Kallidaikurichi Seetharam, Anand Chiplunkar, Cheon Kheong Tan, and Anand Madhavan¹⁶⁵

A Cross-Utility Comparison

The cities studied in this research initiative were selected from wide-ranging contexts—Jamshedpur and Colombo from South Asia; Shenzhen from East Asia; and Bangkok, Kuala Lumpur, Manila, Phnom Penh, and Singapore from Southeast Asia. The objective was to reflect the striking socioeconomic diversity across Asian cities. The cities were selected to offer insights on utilities functioning under different governance systems—public or private—and from cities whose experiences would serve as useful lessons for developing Asian cities. The utilities in four of the cities selected (namely, Bangkok, Colombo, Phnom Penh, and Singapore) are government-owned, while those in the other four cities (Jamshedpur, Kuala Lumpur, Manila, and Shenzhen) are private entities or joint ventures between the government and the private sector.

Table 1 of Chapter I provides highlights of the key indicators in water management in the eight cities and nine water utilities analyzed in this book. In this chapter, we first compare the performance of the utilities covered. We then attempt to develop a framework to define a set of good practices for wider adoption and replication across Asia and in areas of similar contexts worldwide.

Coverage

The utilities continue to pursue the goal of providing a safe piped water supply to every individual in their areas of responsibility. Several of the utilities achieved a high level of coverage despite significant increases in areas to be managed and in population served.

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