Providing Sustainable Water Services to Cities: The Chinese Experiences

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Outline

I. Overview of the Urban Water Supply Situation

II. Key Challenges and Issues

III. Water Market Reforms
I. Overview of the Urban Water Supply Situation
Overview of the Urban Water Supply Situation

Water Supply Infrastructure

- 1949: 58 cities, 2.4 MCM, <20%
- 2004: 661 cities, 247 MCM, 88.85%

Overview of the Urban Water Supply Situation

![National Urban Water Supply Capacity from 1978-2004](chart.png)
Overview of the Urban Water Supply Situation

### National Water Consumption Structure, 2004

- Domestic use: 64.6%
- Industry: 11.7%
- Agriculture: 1.50%
- Ecosystem: 22.2%

- Water Consumption

Overview of the Urban Water Supply Situation

- Water Consumption

### Residential Use of Water from 1979 to 2004

- 1979: 50
- 1984: 100
- 1989: 150
- 1994: 200
- 1999: 250
- 2004: 300

Million m³
Overview of the Urban Water Supply Situation

Water Consumption
Per Capita: 211l/d

Surface water: 81.2%
Groundwater: 18.5%
Others: 0.3%

II. Key Challenges and Issues

- Water Gap
- Insufficient Infrastructure
- Lack of investment
- Water Pollution
- Management Capacity
Key Challenges and Issues

- Water Gap
  - Water Characteristics
  - Urbanization
  - Rapid Economic Development
  - Population Growth
  - Environmental Pollution

Water Characteristics

- Large volume, low availability
- Seasonal variations
- Huge regional differences
Large Aggregate Volume

Average annual water resources per capita is 2185 m$^3$, less than 1/3 of the world average of 7340 m$^3$, ranked 88th in the world.

Low Per Capita Availability
Seasonal Variations

Non-flood season (8 months)  Water is unevenly distributed within a year.
70% of rain concentrates in the flood season and 30% of rain concentrates in the non-flood season. Total runoff varies drastically between wet years and dry years.

Flood season (4 months)

Regional Differences

Precipitation in northern part of China: 50–800mm

In northern part of China:
Water resources: 19%
Percentage of population: 47%
Cultivated land: 65%
GDP: 45%

In southern part of China:
Water resources: 81%
Percentage of population: 53%
Cultivated land: 35%
GDP: 55%
Urbanization

- Urbanization rate
  1979: 17.9%
  2005: 43%
  2010: 47%
- New Villages Movement

Population Growth

- Urban Population
  1978: 76.82 million
  2005: 540 million
  2010: 600 million
Rapid Economic Development

- GDP Growth Rate: 7-8%

Water Pollution

Eutrophication: occurs in 65% of the lakes

40% river does not meet the Grade III national quality standard.
Water Gap

- China's population in 2030: **1.6 billion**
- Water availability per capita in 2030: **1750 m³**
- Total water demand: **700—800 km³**
- Water gap between the demand and supply: **130-230 km³**

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8 8
6 6
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2 2
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Driving forces

- Natural reasons
- Human activities
- Shortage of capital
III. Water Market Reform

- Strategies and Policy Reforms
- Legislative Shifts
- Institutional Shifts

Strategy Reform

- National Goal: to guarantee the access to clean and safe water

- National 11th five-year plan (2006-2010):
  - build a water saving and resources recycling society
  - To enlarge construction and rehabilitation of water supply infrastructure and piping system
Guidance Catalogue for Foreign Investment

- Foreign investment can participate in the construction and operation of urban water supply plants.
- Outbreak: the construction and operation of water pipeline network was first listed in the category of limited foreign investment.
- Broaden the market approval for monopolized sectors and to introduce the competition mechanism.

Historical changes of Water Resources Law

- Article 7: The state will establish a water abstraction permit system, and anyone who consumes the water resource shall pay accordingly for this usage.
- Article 49: Water consumption will be charged based on the actual amount of water consumption, and the progressive water tariff system will be executed if users exceed their water quotas.
Institutional Changes

Historical changes of Water Resources Law

- Article 9: The state shall carry out a system of unified administration on water resources in association with administration at various levels and by various departments.

Major Players

Regulators

- Ministry of Water Resources, MWR
- Ministry of Construction, MOC
- Ministry of Health, MOH
- Ministry of Treasure, …
Major Players

- Investors
- Operators
- Researchers
- Lawyers, …

Incentives

government

market
Thank You