Integrated Urban Water Management in Beijing

Dr. Fu Sun
Coordinator, APCWS
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Why Beijing as a case study?

- **Water-scarce city**
  - Water resources in 2013: 118.6 m³/capita (1/10, 1/50)
- **Fast-developing megacity**
  - Population in 2013: 21.1 million
Why Beijing as a case study?

- Reflection and realization of water management policies promoted by the central government
- Specific water management policies tailored to its own socio-environmental characteristics
Transition to IUWM

• 1950s: a political, economic and cultural center, a powerful industrial base and a science and technology center --> exploiting water resources to favor the development of industries
• 1980s: control of population size, restructuring and relocation of industries --> integration of water resources development, water conservation, and water resources protection; a water-efficient city
Transition to IUWM

• 1990s: integration of water conservation, water resources development, and water resources protection; integration of surface water and groundwater management; integration of engineering and non-engineering measures to manage urban flooding

• 2000s: tailoring urban development to water availability, a water-efficient city, the strictest water resources management
Beijing’s IUWM scheme

• Managing the drivers of pressure on water resources
• Improving water use efficiencies
• Diversifying water supply sources
• Protecting aquatic environment and ecosystems
• Strengthening institutional arrangement
Beijing’s IUWM scheme

• Managing the drivers of pressure on water resources
  – Control of population size is not a success: 18.0 million in 2020 (planned), 18.6 million in 2009 (actual)
  – Regulation over industrial scale, structure, and layout contributes to the decline in agricultural and industrial water demand
  – Control “increment” and reduce “stock”: catalog of water-efficient processes, products, and equipment; closing water- and pollution-intensive industries; a comprehensive water impact assessment in parallel with environmental impact assessment for new development programs and projects
Beijing’s IUWM scheme

• Improving water use efficiencies
  – Water conservation since the 1960s
  – Water conservation facilities should be designed, built, and operated simultaneously with its main project since the early 1980s
  – Water quota management for major industries
  – Technology catalogs of water-saving and pollution-reducing technologies; water-saving devices
  – Pricing policies: penalty charge scheme for industries since the early 1980s; water prices increased 10 times in the recent two decades; tiered water pricing for household users since 2014
Beijing’s IUWM scheme

• Diversifying water supply sources
  – Wastewater reuse first required in hotels and public buildings in 1987; large-scale, centralized wastewater reuse has developed rapidly since 2001 (22.1% in 2013)
  – Stormwater utilization facilities should be designed, built, and operated simultaneously with the main project since 2003
  – The Middle Route Project (MRP) for the South-to-North Water Diversion Project in full operation since December 2014; the Beijing-Shijiazhuang reach of the MRP supplied water to Beijing between September 2008 and April 2014
  – Seawater desalination and deep groundwater utilization as strategic technology reserves
Beijing’s IUWM scheme

• Protecting aquatic environment and ecosystems
  – Started to tackle water pollution issues in the early 1970s
  – “Polluter pays” policy adopted in the early 1980s
  – “Permits for discharge of pollutants” policy implemented in 1997
  – First local Discharge Standard of Water Pollutants (Trial) in 1985
  – A compensation mechanism for water environment protection introduced in 2014
Beijing’s IUWM scheme

• Strengthening institutional arrangement
  – Discussed and tackled at the national level and with the coordination of the central government directly
  – A top-level coordination task force for the sustainable utilization of water resources in Beijing in the early 21st century established in 2001
  – Beijing Water Authority (BWA) established in 2004, responsible for water resources planning and management, surveillance of water and wastewater industries, water conservation, management and protection of urban rivers, reservoirs, lakes, and dikes, etc.
Some reflections

• Limitation of the case study
  – Regions of high priority
  – Focus on Beijing only, neighboring regions?

• For fast-developing countries, the rate water issues emerge and accumulate usually outpaces that the capacity grows to solve them.
  – Control “increment” and reduce “stock”
  – Leapfrog for developing countries as late comers
  – Solve the problems resulting from growth/development by growth/development
  – Political will on the type of growth/development pursued is crucial.
Thanks for your attention.