

SWITCH—Beijing

Professor Cai Jianming
(IGSNRR, CAS)

Dr. Ji Wenhua
(Yunnan University)

Lodz 2010-10-14



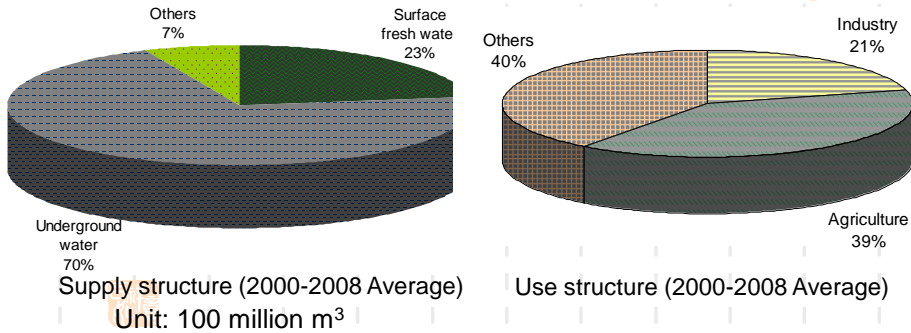
Outline

- Introduction
- Urban water and management
- SWITCH-Beijing progress
- Perspectives



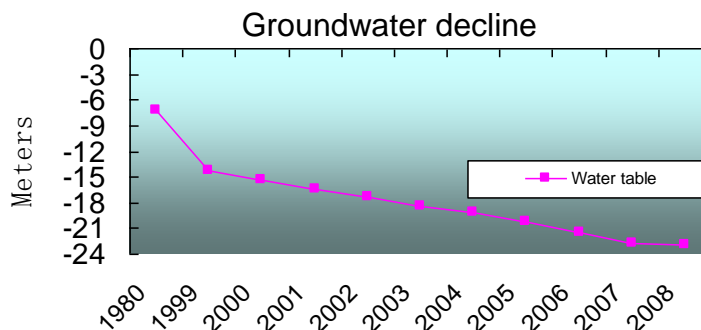
Urban water and management

- Per capita fresh water resources is less than 300 m³ per year, which is one-30th of the world's average



Year	2000	01	02	03	04	05	06	07	08
Local water	17	19	16	18	21	23	22	24	34
Use	40	39	35	36	35	35	34	35	35

Urban water and management



- Agriculture faces water bottleneck
 - Surface fresh water is unavailable
 - Groundwater decline quickly
 - Rainwater is variable and concentrated in summer

Urban water and management

■ Innovations: **Waste water use**

- Waste water production: 3.6 million m³ per day
- Waste treated capability: 3.3 million m³ per day
- Waste water reuse: 600 million m³ in 2008 and 650 million m³ in 2009

Under the 11th five-year plan, 400 million m³ treated water available for agriculture in Beijing in 2010 (which is mainly located in Daxing District). However, not all the farmers around Beijing can access treated wastewater

Urban water and management

■ Innovations: **Rainwater harvesting**

- Being propagated by the Ministry of Science and Technology with the Municipality
- Capturing rainwater in residential areas of the city has been promoted since 2000. Especially the last years before the Olympics saw an increase in RWH projects, and the Beijing National Stadium for the Olympics captured rainwater was used for toilet cleaning, cooling towers, fire fighting, and irrigation of green areas
- Up to 2008, more than 600 rainwater-collecting projects were built and more than 100 million m³ rainwater are re-used per year.

Urban water and management

- Innovations: **Rainwater harvesting**

- Capturing rainwater for irrigation of crops, using the roof of greenhouses, is being propagated in Beijing since June 2005. Agriculture is the largest consumer of water in Beijing, and relies for 70% (in 2008) on groundwater
- Rainwater harvesting using greenhouses is stimulated by the Beijing Agricultural Bureau via its service extension offices located in each district
- The demonstration project of SWITCH in Beijing, supports this work by analysing water flows and cost/benefit analysis of typical farming systems, and by working with a Huairou Vegetable and Fruit Cooperative, Beijing, in linking other productive activities, like, mushroom production and agro-tourism.

Urban water and management

- Innovations: **Water pricing**

- Since 1996, tap water price for living (in urban area) rise from 0.5 yuan per m³ to 4 yuan per m³ in 2010
- In April 2007 the Beijing Municipal Government started to charge a fee for agricultural use of ground water exceeding a certain quota

SWITCH-Beijing progress

- **Research:** showing the potential of the innovations
 - PhD Li Jiuyi: Assessment of the potential of water sources and cycles at catchment level applied to greater Beijing area, and the potential of these different sources of water for productive uses, using RS and GIS technologies.
 - PhD Ji Wenhua: Monitored the development, performance and up-scaling of the demonstration in *Huairou District*, Beijing. Also focus on building suitability map of RWH at the municipal level.
 - 2 PhD theses: Study on Water Scarcity, its Risk Assessment and Management in China (Chinese by Li Jiuyi); Optimization and Management of Rainwater Harvesting and Reusing——A Case Study of Beijing (Chinese by Ji Wenhua)
 - 6 Papers published in high quality journals (2 papers in English)

SWITCH-Beijing progress

- **Demonstration:** An innovation greenhouse RWH
 - Increase the available water
 - Reduce damage due to water scarcity
 - Improved cooperative vegetable production for the Beijing market (grapes, dragon-cactus, mushrooms)
 - In combination with agro tourism
 - Groundwater infiltration of surplus water
 - Linking the various (often new) sectoral institutions (water and agricultural bureaus)

SWITCH-Beijing progress

- Since its start in 2008, the demonstration project showed positive results (2008 was a reasonable good year in terms of rainfall) providing high quality irrigation water and increasing farmers' income substantially.
- Local government, which participated in the working group, acknowledged the results and support further application of the developed technology.
- It is expected that the results can be integrated into the ongoing policies and the 12th five year plan (2011-2015), and some more suitable policy guidelines regarding effective water use and management will be developed.

SWITCH-Beijing progress

■ Learning Alliances

- After the first LA start up meeting in 2007, the Beijing LA has been facilitated formal and informally by IGSNRR
- The topics and issues discussed at these occasions, relate to the Beijing municipal water resource use and management, but also connecting to the whole country. SWITCH approach and experiences are in this way shared to all partners in the wider LA.
- By combining formal and informal approaches, it was sought to provide a communication and cooperation platform for stakeholders, and seeking to influence further policy-making.

SWITCH-Beijing progress

- In Beijing, the following institutions formed the **Beijing Working Group** met regularly:
 - IGSNRR: Cai Jianming, Li Lijuan, Ji Wenhua,
 - Beijing Water Environment Protection Bureau: Dr. Wang Yan
 - Beijing Municipal Research Institute of Water Planning: Eng. Zhang Tong
 - Beijing Agro-Technical Extension Center: Deputy leader Wang Zhiping.
 - Huairou Grape Cooperative : Ms. Zan Xiaojing and Mr. Zhao Qingzhong
 - At Huairou District level, the team members of IGSNRR met regularly with Zan Xiaojing and Zhao Qingzhong, as well with representatives of the District Authorities

SWITCH-Beijing progress

- **Dissemination**
 - A website (in Chinese) has been organised. Initially reports of events, important conferences, reviews, as well as research progress were uploaded, and linkages to SWITCH and important institutions in Beijing were provided.
 - LA and WP 5.2 training materials (Visioning & strategic planning etc) have been translated in Chinese, and added to the website;
 - The UA Magazine no. 20 on Water for Urban Agriculture has been translated in Chinese. In addition a UA magazine on Nutrient Management (currently developed by ETC) will be translated in 2010.
 - Publications and scientific papers in journals or workshops;
 - Two Ph.D. thesis and subsequent papers

SWITCH-Beijing progress

- There are plans to develop a scientific community and students network working on IUWM (planning)
- Three papers (in Chinese) have been published in high quality Journals, and one in English in the Journal of Chinese Population, Resources and Environment. Information has also been shared through the UK magazine the New Agriculturist
- A paper has been published at “Water Infrastructure for Sustainable Communities: China and the World” in Sep. 2010.
- Dr. Astrid Freyeisen of ARD German Radio visited Beijing in 2010 to interview Prof. Cai and Dr. Ji about their work, especially related to SWITCH in Beijing.
- And Dr. Ji attended the annual SWIF committee meeting in Beijing, and presented the SWITCH-Beijing programme and demonstration.

SWITCH-Beijing progress

■ Up-scaling

- The potential of the adapted technology of RWH and improved production is high. More than 9 sites have adopted the technology.
- The South-North Water Transfer project is delayed to 2012
- The current proportion of irrigation using rainwater harvesting is still very low, accounting for less than 1 percent
- In 2009, IGSNRR agreed with the Beijing Agricultural Bureau (Extension Center), one of the key stakeholders, to undertake more joint action research at selected demonstration sites on RWH. About 10 other RWH programmes will be analysed.
- Further up-scaling of the SWITCH technologies, will need to occur. The Huairou cooperative partners has applied for a patent for the RWH technology, but adequate guidelines and training materials (for other farmers) still need to be developed.

Perspectives

- Continue the agreement with the Extension Office of the Agricultural Bureau and the Water Bureau, and seek to extend this work to other dry areas of Northern China
- develop a paper / policy information brief on the experiences of SWITCH China in decentralised innovation development and inter-institutional collaboration on this. Seek to position this (adaptive) process in a longer perspective
- Organise a well-organised, final workshop around October/November 2010, to present the scientific findings and policy recommendations
- Plan to have a training for Farmers and/or extension officers on the lessons learned in the demo (develop the guidelines and the handbook)

Thanks for your attention!