

Water balance analysis and tools for regional water resources management in the Beijing-Tianjin-Hebei Region, China

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### **Abstract**

The Beijing-Tianjin-Hebei Metropolitan Region is the biggest urbanized megalopolis in North China. The region has one the lowest water resources availability per capita in China and around the world. Rapid economic development in the past 40 years has resulted in substantially increased water consumption in the region which led to various water security problems including huge burden on water supply, groundwater overdraft, serious damage of river and lake ecosystems etc. Water scarcity has now become one of the largest limiting factors that hinders the further development of the region. The objective of water resources management in this region is thus to ensure healthy balances between the natural and the societal water circulation. This means we need to protect the natural hydrological flow to maintain water's service functions, and in the meantime fulfill the increasing water demand for economic growth. In the present study, we inspected past evolution and future trend of the region's water budget, and subsequently proposed methods for restricting water use and promoting multi-source water supply optimization. This research also reviewed some new concepts and technologies which can potentially help us overcome the water security challenges in the Beijing-Tianjin-Hebei region.