

China Water Dynamics – Modeling of China’s Water Resources

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Abstract

Sustainable water resources management is an interdisciplinary approach to deal with water crisis on different scales. System dynamics modeling proves to be successful in integrating theories and techniques grown out of multiple disciplines. Based on system dynamics modeling, this paper builds the ChinaWater Model as a tool for sustainable water resources management in China. Current status and prospects of the country’s water resources are simulated by the model. Four classic scenarios for development are also explored through model simulations. Results of the paper demonstrate that 1) surface water resources in China are being extracted excessively, which could result in severe water shortages within ten years; 2) fast urbanization is a driving force for more water consumption; 3) a potential population decrease in the future could lead to an abrupt reduction of water demands in China; 4) strengthening science and technology capability and enhancing wastewater treatment capacity can increase water use efficiencies, reduce water consumption and increase water resources by industrial and domestic uses; 5) effective measures have to be found and taken immediately before severe and unrecoverable problems are caused by water shortage and pollution directly or indirectly.

Key words: system dynamics modeling, water resources management, China, policy analysis
