



Scenario Simulation Analysis of Water Resources Carrying Capacity of Urban Agglomeration in Arid Areas: A Case Study of Lan-Xi Urban Agglomeration in Northwest China

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Abstract: The urban agglomeration development planning has become a main form and an important driving force for China's urbanization process. However, in the context of climate change, with the rapid development of urban agglomerations, more and more people living in cities have further aggravated the problem of urban water security. The contradiction between supply and demand of water resources has become a severely constraint factor to the economic, social and environmental development of urban agglomerations, especially in the arid regions of northwest China. As the basic resource for human production and life, water resources can only ensure the sustainable development of urban agglomerations by maintaining the natural balance of the "social-economic-ecological" system with water resources as the core. The carrying capacity of water resources is an important indicator for measuring the extent to which regional water resources can maintain a healthy social and economic development. The Lan-Xi urban agglomeration located in the northwestern part of China [U+FF0C] which is an arid and semi-arid zone with backward economic development and lack of water resources. It mainly consists of 22 prefecture-level administrative divisions, with Lanzhou city and Xining city as the center. Therefore, this paper intends to use the water resources carrying capacity theory and system dynamics method to construct the water resources carrying capacity model of Lan-Xi urban agglomeration under the dual pressures of climate change and social economic development, analyzing the binding effect of water resources on the social and economic system. Finally, this paper intends to use the Scenario simulation analysis method to design three scenarios, such as "planning scenario", "drought scenario" and "adaptation scenario" according to the development plan of Lan-Xi urban agglomeration. The research results will provide decision support for the future development planning of the Lan-Xi urban agglomeration.

Key words: Scenario simulation; Water resources carrying capacity; Arid area; Lan-Xi urban agglomeration; Northwest China