Problems of regional water security and possible countermeasures in a rapidly developing region of southern China

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Abstract The Pearl River Delta region (PRD), characterized by a continually growing population and the fastest pace of development in China, is currently confronting an increasing number of serious issues regarding water security, e.g. floods, droughts, water pollution, and saltwater intrusion. These problems have a variety of negative impacts on human society and the surrounding environment, e.g. mortality of humans and animals, property damage, eco-environment degradation, and health deterioration. The objective of this paper is to: (1) summarize the basic characteristics of water supply systems in PRD in terms of its geographical, climatic, hydrological and socio-economic conditions; (2) evaluate the sustainability of water supply system in 4 major cities in PRD from a regional perspective; (3) address and discuss the severities of water pollution and saltwater intrusion by reviewing the existing research findings; and (4) propose possible countermeasures to sustainable development strategies of water resources under the new challenges of the intensified human activities in this unique aquatic environment in China.

Key words water security problems; environment; climate change; human activity; countermeasure; Pearl River Delta