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New Framework of Sustainable Watershed Regional Development and Urban Agglomeration for the Asia-Pacific Rim

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ABSTRACT

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"Coordinated and green development are both ideas and measures." This research discussed practical and feasible analysis tools for environment and resource framework for the Asia-Pacific Rim. A literature review of water environment social economic system was carried out, and included a discussion of a small and medium-sized urban coordinated development theory.

1. Introduction

With the advent of the era of network information, big data and cloud platform, such digital watersheds and smart urbans have entered rapid development phase, as digital Haihe River, Yellow River, Yangtze River, Qiantang River and Pearl River; and Hohhot, Dalian, Beijing, Nanjing, Wuhan, Taizhou, Hangzhou, Shenzhen. Meanwhile, in the context of extreme weather, digital watersheds, metropolis, smart middle-sized and small cities' green harmonious and sustainable development issues would be put forward.

A global water sustainability perspective focused on regional environment social economic system is different from either a management perspective or an institutional perspective.

In the New Normal of China, measures against sewage, flood water, drainage water, water supply and water-saving, namely governance of water's five aspects has been taken in Zhejiang for regional provincial water sustainability, in-stead of expression of ecosystem services, water resources management, water services management, and flood defence principle. Both Yiwu city of Jinhua prefecture-level city and Yuhuan county of Taizhou prefecture-level city of Zhejiang province in China have implemented some pilot projects and have already achieved some performance in water-saving society construction (Li et al., 2009; Li and Yang, 2011). However, since reform and opening-up, complexity of regional environment social economic system has been growing in small and medium-sized cities of Yangtze River Delta, where water shortage due to the deterioration of water quality is quite serious (Li, 2005; Li et al., 2006; Li et al., 2008). A drinking water crisis, caused by blue algal bloom in Taihu Lake due to eutrophication in Wuxi city, Jiangsu province in May, 2007, has suffered great losses, such as increased risk of cancer. The mode for an economic and social system with characteristic of resource sharing, realizing industrialization firstly and marketization secondly, has even to be reviewed due to this above drinking water crisis. Furthermore, dead pigs pulled from rivers in Shanghai had become a hot issue of great both domestic and foreign emotional concerns on a river water environment in 2013. Therefore, water governance in Yangtze River Delta in China has become an urgent problem to be solved arising with rapid urbanization of the area (Xu et al., 2008, 2009; Li et al., 2012; Li, 2013; Li, 2014a).

2. Literature Review for Water Environment Resource Framework

Regional environment social economic systems are connected with a local hydro-logical structure; definitions of environmental flow, of total water withdrawal, and of adaptive capacity from the Southern Hemisphere to the Northern Hemisphere. Environmental flow refers to how much water is needed by a river and when, in order to support the river's basic ecological functions due to the case of Santa Fe River in the United States (Groenfeldt, 2013). While total water withdrawal represents sustainability capacity of environment social economic system to mobilize water resources available without distinction of uses (Dondeynaz et al., 2012). And adaptive capacity is an underlying ingredient for dealing with some of the fundamental challenges to aligning complex adaptive environment social economic system, and institutional dynamics in practice of Perth and Adelaide in Australia were given (Bettini, 2015).

In the Southern Hemisphere, case studies in Africa for water resource and public participation were summarized. Three of South Africa's major rivers (Orange-Senqu, Limpopo and Inkomati) are shared with neighboring countries, how-ever, the properties of institutional arrangements governing water resources often do not fit ecosystem properties (Herrfahrdt-Pähle, 2014). Ghana's capital city, Accra, is a fast-growing, coastal urban center facing considerable environmental social system planning challenges, especially public participation in three kinds of community, namely indigenous community, in-migrant community recently established and poor community with population growth (Morinville and Harris, 2014).

And in the Northern Hemisphere, case studies in Japan, Bangladesh, India, Turkey, the United States, the Netherlands and England for flood damage, a dynamic socio-economic model, rural village sanitation, water provision, water transfer, land development, prevention of mudslides, water strategy and adaptive management were summarized. Regarding water resources management as the regional and purpose wise distribution of public goods, damage of agriculture and resident due to flood in Chitose river basin, Hokkaido was analyzed; and based on Principle of Material Balance, an ecosystem model and a dynamic socio-economic model were specified to analyze an optimal policy to improve the water quality of Lake Kasumigaura, Ibaraki, Japan (Yamamura and Miyata, 1980; Higano and

Yoneta, 1998). Sanitation issues in Bansbaria, Jessore, Bangladesh and willingness to improve their living environment after installing pond sand filter facility were introduced (Sakai et al., 2011). Unsustainable water provision of Hyderabad in India to the global level and its interactions with national and city-level decision-making bodies were described (Nastar, 2014). Inter-basin water transfer projects in Melen and Kizilirmak, Turkey, concerning urban-rural life, un-sustainable water use, and agricultural water resources practices were assessed (Islar and Boda, 2014). Challenges in EU benchmarks, schematic layout and the development timeline of Dublin's water supply system were described, in relation to the largest water works project for long-distance water transfer ever proposed in Ireland from the midlands to Dublin (Kelly-Quinn et al., 2014). Adaptive management may foster ecological resilience in the Columbia River basin covering 672,102 square kilometers in Canada and the United States (Cosens and Williams, 2012), however, a much longer-term water quality monitoring effort is needed to identify the effectiveness of alternative land development and water governance policies, due to a conceptual model for coupled natural and human systems framework for understanding the coupled environmental governance and water quality in the Columbia River of Portland-Vancouver metropolitan area (Chang et al., 2014). Canada lacks a current well-coordinated water strategy, while Chile lacks regional discretion, leaving rural communities especially vulnerable in times of disasters such as mudslides and with water programs (crop insurance and drinking water or sanitation) that have not been particularly effective (Hurlbert and Diaz, 2013). There are such factors as financial compensation, broad environment social economic system changes and flood disasters in many Dutch island of IJsselmonde in the Netherlands near Rotterdam (Mostert, 2012).

3. Recommendations on Green Environment Social Economic System for Asia-Pacific

Global case studies for water resource governing, public participation, flood damage, a dynamic socio-economic model, rural village sanitation, water provision, water transfer, land development, prevention of mudslides, water strategy and adaptive management were summarized. Global warming may change some aspects of the water circles, such as twin typhoons or trityphoons, and/or in the most withered period, affect small and medium-sized cities sustainability development. Water environment social economic system is a superb system for local region people and would not be changed temporarily. Furthermore, climate change adaptation strategies need to be tailor-made with respect to local environment social economic system for Asia-Pacific.

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