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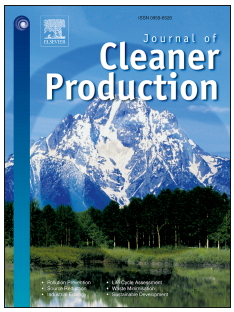

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Modelling the transition toward urban sustainability: A case study of the industrial city of Jinchang, China

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Abstract

Sustainable urban development is a fundamental discourse for cities in industrialising nations. This is particularly so for new industrial cities in rapid developing countries where local residents and ecological systems have been significantly impacted by economic growth. In this paper, we draw upon the case of Jinchang City (north-western China) to demonstrate how the transition toward urban sustainability can be understood and facilitated. By using an urban metabolism model combined with qualitative social research and policy analysis to understand the urban systems, this research verifies that urban sustainability requires good governance, policy and planning, as well as the participation of local enterprises and residents. This can be built on the notion of urban metabolism that identifies changes and suggests adaptive responses, which when combined with informed public understanding can create adaptive changes in the physical, economic and social dimensions of the city. In particular, such change is predicated upon the rapid development of appropriate human capital that can be employed to monitor and evaluate the functioning of the urban systems, facilitate innovation and build a diversified economy. The rapidly growing cities in north-western China provide a model of how new industrial cities have the potential to be significant actors in the transition toward global sustainability. Specifically this research suggests how necessary environmental improvements for north-western China can be achieved and a model for the developing world can be created.

Keywords: Urban sustainability; Urban transition; Industrial cities; Material flows; Cleaner production; Human response

1. Introduction

Rapid urbanisation around the world associated with intensive resource and energy consumption, waste generation, and environmental degradation calls for a transition toward more sustainable models of urban development (Giddings et al., 2005; Girardet, 1999; UN, 2002). Although cities have made great contributions to economic welfare, improvements to living conditions, and social progress, the growth of cities has also generated significant challenges to biophysical systems that potentially threaten human health and long-term development (Bettencourt and West, 2010; Dye, 2008; Galea and Vlahov, 2005; Leon, 2008; Moore et al., 2003; Shen et al., 2012). Often, however, the environmental externalities and impacts on human health are marginalised in favour of economic concerns (Matus et al., 2012a). The UNEP's ten-year framework of programs on sustainable consumption and production (10YFP) calls for improved systems of economic, industrial and environmental management involving integrated systematic change (Cohen et al., 2013; Tseng et al., 2013). This challenge is global, but China in particular offers researchers opportunities to test innovative systemic changes (Matus et al., 2012b; McMichael, 2011). Many of China's large and newly emerging small to medium sized cities have reached crisis levels in terms of