

# **Planning for Socially Sustainable Brownfield Redevelopment: Case Study of Shenzhen, China**

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## **Introduction**

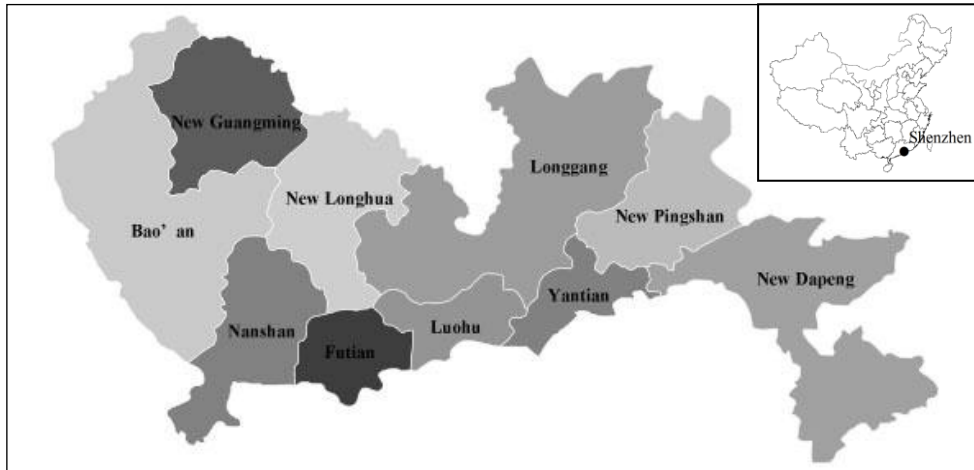
At present, the world is experiencing an unprecedentedly rapid process of urbanization, during which many serious urban problems emerge, like waste of land, car congestion, increasing air pollution, et cetera. It is in this current situation that massive urban expansion is no longer encouraged, but instead replaced by more sustainable and intensive utilization of existing urban land. Therein, brownfield redevelopment has been recognized as an important way for implementing a more sustainable urban development. However, present proof for this statement is not very convincing. That's why this PhD research intends to shed light on the sustainability issues of brownfield redevelopment. In particular, attention will be focused on the social dimension of sustainability, given the fact that this dimension is often neglected in the sustainability debate.

## **Problem Statement**

Brownfields are the industrial and commercial lands, sites and facilities which are abandoned, idled or underused due to real or perceived environmental threats and other developing obstacles. Moreover, these sites cannot be immediately put into use without treatment (Cao and Guan, 2007). In western countries, brownfield redevelopment projects have been conducted for many decades. However, brown-

field redevelopment isn't necessarily inherently sustainable (Dair and Williams, 2004; Padiaditi et. al, 2008). Actually, many brownfield redevelopment projects have been proved to be unsustainable (Ball, 1999; Couch and Dennemann, 2000). As a consequence, in this PhD research I intend to seek ways to make the process of brownfield redevelopment sustainable, or more specifically, socially sustainable. Social sustainability can be regarded the social dimension of sustainability, which consists of many principles like basic needs, social equity, social inclusion, democracy, participation, and individual's happiness and wellbeing (WCED, 1987; McKenzie, 2004; Littig and Grießler, 2005; Vallance et al., 2011; Chiu, 2002). It is noticed in international literature that among others, one principle stands out within social sustainability, notably 'social justice' (WCED, 1987; Torjman, 2000; Littig and Grießler, 2005; Colantonio, 2010). With regard to brownfield redevelopment, social justice is closely related to the phenomenon of 'brownfield gentrification', that is, the redevelopment of brownfield sites may cause the in-migration of higher income residents and the out-migration of low-income residents (Fisher, 2011), resulting in social injustice in surrounding areas. This research will conduct empirical studies in China to analyze brownfield gentrification. Over there, brownfield gentrification occurs at a massive scale due to the transformation of the economy from the secondary to the tertiary sector. As an outcome of the research a conceptual framework for planning support will be developed for the proper incorporation of social sustainability into brownfield redevelopment projects. It is foreseen that so-called Planning Support Systems (PSS) can play a good role in brownfield redevelopment. These PSSs are 'a subset of geotechnology-related instruments that incorporate a suite of components (theories, data, information, knowledge, methods, tools) that collectively support all of or some part of a unique planning task' (Geertman and Stillwell, 2003). Brownfield redevelopment is one form of urban development that involves many different stakeholders and has impacts on various and diverse issues (social, economic, environmental) at different spatial scales, thus an effective planning support system is imperative.

## Study Area



*Figure 1: Location and Administrative Divisions of Shenzhen City*

Shenzhen city is located in the southeast of China (Figure 1). Ever since central government of China designated Shenzhen as a Special Economic Zone (SEZ) in 1979, the city has been growing so fast that the population increased from less than 20,000 people before 1979 to 10.4 million people in 2010 (SZBS, 2011). Owing to economic transformation, many factories previously located in central urban area of Shenzhen were either bankrupt or moved to suburbs of cities for cheaper land rents, leaving behind lots of vacant, probably polluted areas. According to UPDIS (2006), within the SEZ, 13 old industrial zones have an urgent need to be redeveloped, and it is estimated by Urban Planning, Land and Resources Commission of Shenzhen Municipality that up to 90 km<sup>2</sup> of brownfield has the potential to be redeveloped in Shenzhen from 2010 to 2015. As a result, it is crucial to redevelop these brownfields in a managed and sustainable way for its future development.

## Methodology

As shown in the conceptual framework (Figure 2), firstly, on the basis of comprehensive review of literature, the formation process of brownfield sites in Chinese cities as well as China's unique institutional constraints regarding brownfield redevelopment will be interpreted. Secondly, empirical research will be conducted to analyze brownfield gentrification in China. By using hedonic model, the impacts

of brownfield and brownfield redevelopment on surrounding property values will be analyzed. Based on a combination of GIS method and statistical analysis, the hypothesis of brownfield gentrification will be tested. Moreover, the underlying reasons behind brownfield gentrification will be discussed. Lastly, based on the knowledge gained from empirical studies, a conceptual framework of Planning Support System will be designed for managing unintended social consequences (such as brownfield gentrification) of brownfield redevelopment.

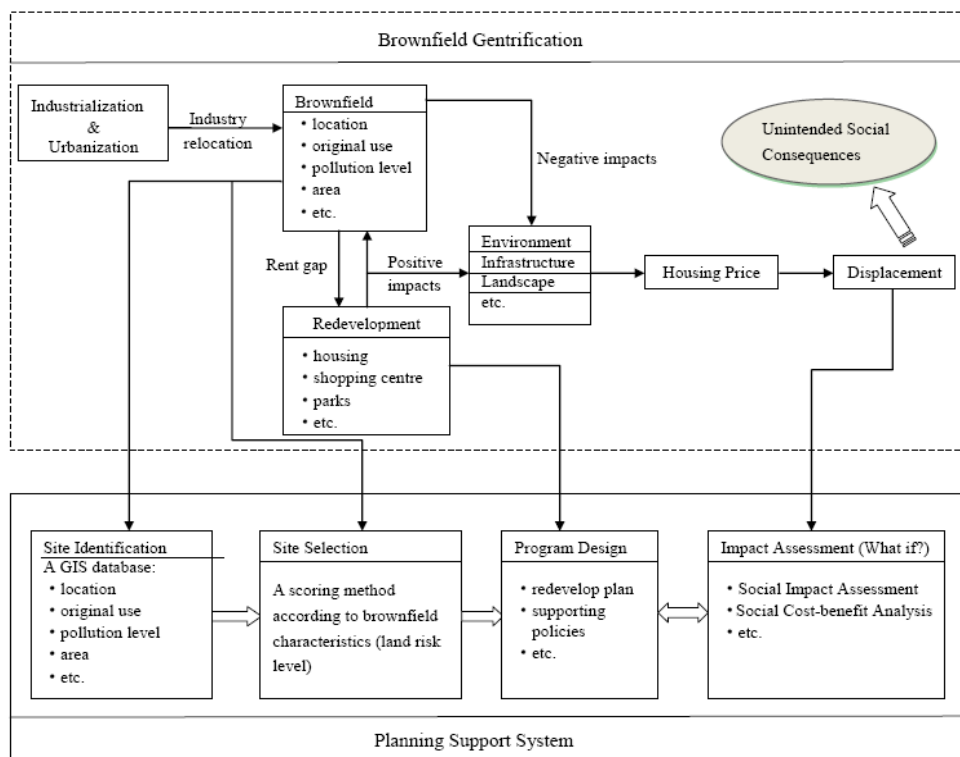


Figure 2: Conceptual Framework

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