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Exploring urban-rural disparity of the multiple deprivation index in Guangzhou City from 2000 to 2010

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ABSTRACT

Both scholars and policy makers have noted the growing issue of poverty and deprivation during China's rapid urbanization. Often previous studies examine the spatial distribution of deprivation in inner cities and suburban areas, but fail to assess the whole region. Moreover, the cross-sectional nature of these studies is unable to discover its changes over time. This research aims to evaluate multiple deprivation in the administrative area of Guangzhou and its evolution from 2000 to 2010. Using the Fifth and Sixth Censuses, this study is based on 2643 neighborhood committees and 167 sub-districts (or towns) of inner city, suburban areas, and outer areas of Guangzhou. During the decade, there was persistent multiple deprivation in some areas of the inner city. The deprivation improved in suburban areas, but urban villages experienced deteriorating deprivation. Although urban-rural disparity became smaller in the outer areas, there were still some worst-hit neighborhoods. The evolution of multiple deprivation is collectively affected by institutional factors (including the dichotomous urban-rural system, economic restructure, and housing reform), and market factors (such as, market-selected urban regeneration, economic growth and individual residential mobility. This study helps governments to establish anti-poverty polices based on the characteristics of different areas and offers guidelines for urban regeneration planning in the inner city and rural planning of the outer areas.

1. Introduction

Poverty is a worldwide problem. The elimination of poverty is one of the greatest challenges in both developed and developing countries. Since income alone does not capture the extent of the disadvantage associated with poverty, broader measures must be considered to account for living conditions and opportunities. In order to account for the broader experience of poverty, scholars have emphasized multiple deprivation, which refers to a shortage of food and clothing, living conditions, education, and so on (Townsend, 1987). Previous studies have assessed multi-dimensional poverty systematically and comprehensively using various indices of multiple deprivation (such as the Index of Multiple Deprivations, IMD; and the General Deprivation Index, GDI) (Langlois & Kitchen, 2001; Noble, Wright, Smith, & Dibben, 2006; Pacione, 2003). These indices are a tool to help evaluate the spatial distribution of multiple deprivation (Noble et al., 2006), and are used to develop anti-poverty polices based on the characteristics of different areas.

Previous studies explore the spatial distribution and driving forces of multiple deprivation in the inner city and inner-suburban areas in its underlying mechanism (Kitchen, 2001). For most cities in developed countries, it is associated with globalization and local development, urban social welfare policies, and industrial transformation (Broadway & Jesty, 1998). For developing countries in transition, such as South Africa and China, the heritage of previous political systems continues to have a significant impact on the spatial distribution of multiple deprivation of local and regional areas (Noble & Wright, 2013).

However, two notable gaps emerge in the existing literature. First, most studies rely on cross-sectional data (Bailey & Livingston, 2008; Langlois & Kitchen, 2001; McLennan, Barnes, Noble, Davies, & Garratt, 2015; Pacione, 1995) and cannot demonstrate the changing pattern of multiple deprivation over time. Accordingly, they have a limited capacity to predict the distribution of multiple deprivation in a region and guide decision-making of area-based anti-poverty policies. Second, previous studies tell only part of the story: they focus on the inner city and inner-suburban areas of a region, but overlook its outer suburbs and outer areas. The latter areas are experiencing dramatic changes in rapidly urbanizing China. Since housing and industrial developments

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have converted a large amount of farmland to urban land, these areas have become a mixture of urban and rural areas. The spatial distribution of multiple deprivation is presumably changing in these areas. Furthermore, population structure and household structure also evolve because of the large-scale rural-urban migration. Thus, multiple deprivation in these areas and urban-rural disparity are emerging issues.

This study attempts to fill the gaps and explores the spatial pattern and changes of multiple deprivation during the rapid urbanization in a developing country in transition. We use the whole administrative region of Guangzhou, a megacity in southern China, as a case. We conduct both cross-sectional and longitudinal analyses using the Chinese Fifth and Sixth Census data based on 2643 neighborhood (village) committees and 167 sub-districts (towns). This study employs two weighting methods and spatial analysis to illustrate the spatial pattern of multiple deprivation in 2010, its changes among three concentric areas and between urban and rural areas from 2000 to 2010, and discusses driving forces of the evolution in urban-rural disparity. This study is unique because it explores the spatial distribution of multiple deprivation in the whole region of Guangzhou, including the inner city, inner and outer suburban areas, and the outer areas. More importantly, it is the first longitudinal analysis of multiple deprivation in China. It illustrates the evolution of multiple deprivation under the collective influences of institution barriers and market forces. It enhances our understanding of multiple deprivation in urbanized areas and urban-rural disparity and their evolution and informs anti-poverty policy-making.

The paper is organized as follows. In the second section, we review the literature on multiple deprivation and propose research hypotheses. Section 3 describes the geographic setting of the study area and presents the data and methods. Results are presented in Section 4. The last section summarizes key results, and discusses research recommendations and policy implications.

2. Literature review and research hypotheses

2.1. Review of multiple deprivation studies

Multiple deprivation measures material deficiencies and the lack of attention given to these problems by an institutional system. Since the late 1960s, it has served as an evaluation framework for economic and social disadvantages and their spatial distribution (Noble et al., 2006). Multiple deprivation research consists of two key issues: the domain and the indicator. Indicators or variables are often selected to reflect different dimensions of deprivation. A dimension is called a 'domain,' which is a group of similar factors indicating one aspect of deprivation at the aggregate level (Yuan & Wu, 2014). Early studies, such as the Index of Local Condition (ILC) 1991 (Robson, Bradford, & Tye, 1995) and ILC1998 (DETR, 1998), used seven common domains, including income, employment, health, disability, education, skills and training, as well as residential locations and access to public services. Multiple deprivation indices have recently undergone significant development. New domains have been added, such as barriers to housing and services, crime, and living environment in the English Indices of Deprivation (EID) 2007, 2010 (DCLG, 2008; McLennan et al., 2015, living environment in research of South Africa (Noble & Wright, 2013), and cultural domain in the study of Fars province in Iran (Najjary, Saremi, Biglarbegian, & Najari, 2016).

Previous studies focus on the spatial distribution of multiple deprivation within urban cities, its variation among neighborhoods, and the underlying mechanisms in both developed countries and developing countries in transition. For example, in the UK and North America, the working-class and ethnic minorities (Fieldhouse & Tye, 1996), as well as recent immigrants and groups of non-English speakers, are more likely to suffer from multiple deprivation (Gordon, 1995; Mcculloch, 2001). Because of the economic downturn caused by deindustrialization in developed countries, an increasing population of unemployed workers and low-income families live in inner areas, resulting in high concentrated poverty (Mcculloch, 2001). Unemployed workers, ethnic minorities, new immigrants, and single-parent families also face multiple deprivation in inner-suburban areas (Skaburskis & Nelson, 2014) because of government-subsidized social housing (Ley & Smith, 2000) and gentrification in the inner cities. Economic restructuring, social exclusion, demographic changes, and residential segregation are the primary causes of multiple deprivation in developed countries (Bailey & Livingston, 2008; Pacione, 1995; Wilson, 1987).

In developing countries in transition, path dependency and institutional bias still affect the distribution and formation of multiple deprivation. In South Africa, the spatial distribution of multiple deprivation is closely related to the lingering influence of the apartheid era. Black border zones, where the apartheid "home policy" was implemented, suffer the most from multiple deprivation. In terms of income, occupation, education and living environment, these zones have a higher proportion of the deprived population than other regions (Noble & Wright, 2013). China has undergone rapid urbanization since the 1990s. An underprivileged group emerged because of the deepening reform of state-owned enterprises, the relaxation of the household registration system, and the imbalanced regional development (Chen, Gu, & Wu, 2006; He, Liu, Wu, & Webster, 2008; Wu, 2004). This group largely consists of laid-off urban workers, other unemployed workers and rural migrants, and they are excluded from the social welfare system (Wu, 2004; Wu, 2008). These people are accustomed to residing in either highly deprived areas in older city centers characterized by underprivileged housing conditions, or in ex-industrial districts in inner-suburban areas characterized by high levels of economic poverty (Yuan, Wu, & Xu, 2011). Therefore, the transition from a planned to a market economy has shaped spatial patterns of multiple deprivation in cities.

Previous studies have two major limitations. First, most of the studies rely on cross-sectional data. They can illustrate the spatial distribution of multiple deprivation at a certain point in time, but are unable to show how the deprivation changes over time. Some studies employ longitudinal data, but they generally fall into two categories with limitations. First, Mcculloch (2001) and Ley and Smith (2000) demonstrate an association between deprivation and various aspects of an individual's life, using individual survey data and immigrant data, respectively. However, they focus on individuals who face deprivation, but not the spatial distribution of the deprivation. Second, other studies focus on the spatial distribution of multiple deprivation in either bigger or smaller spatial scales. For example, Broadway and Jesty (1998) explore changes of deprivation in 22 largest Canadian cities at the inner-city level between 1981 and 1991. Since city is the unit of analysis, they cannot illustrate changes in the spatial distribution within a city, which is critical for area-based poverty mitigation. Kitchen (2001) examines the evolving spatial distribution of urban deprivation in the central city and inner-suburban areas of Montréal during 1986–96. However, the spatial scale of a central city or a suburban city is too small because the multiple disadvantages of deprived areas are closely related to the spatial evolution and development of the overall metropolitan area. New development in the outer areas may change the spatial distribution of multiple deprivation in a region. Therefore, studies on this topic should include the whole region, instead of focusing on only certain areas in the region.

Chinese studies share the same two shortcomings. Because of data limitations and the delay in the release of census data, Chinese studies rely on cross-sectional data and do not examine the evolution of multiple deprivation and its relationships with the location, development and regeneration of urban space. Filling this research gap is important for a rapidly urbanizing China, because Chinese cities have expanded dramatically in recent decades and the spatial pattern of multiple deprivation presumably changes greatly.

Moreover, it is necessary to consider the inequality between urban and rural areas in the multiple deprivation research. In general, urban