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An assessment of urban park access in Shanghai – Implications for the social equity in urban China

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HIGHLIGHTS

- The distribution of urban park services is equitable for marginalised population.
- It considers people's self-movement and spatial externalities of facilities.
- Equitable planning approach could mitigate the environmental justice issue.

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ABSTRACT

The question whether urban green resources are equitably distributed across different social groups is a major concern of social equity and environmental justice for both governments and scholars. This topic is particularly relevant for rapidly developing countries such as China where inequality is growing. This paper examines whether and to what extent the distribution of urban park services is equitable for marginalised population in China. We choose Shanghai as the case study and took into account three dimensions of group delineation, namely demographic characteristics, social economic status and social spatial structure. We employ the spatial clustering method to assess the similarities and differences of the association between the spatial patterns of accessibility to urban parks among different social groups. Interestingly, we found that vulnerable groups are favoured over more affluent citizens. Local municipal endeavours have ensured that the access to Shanghai's parks remains socially equitable. Additionally, we attributed it to the path dependence of China's socialism legacy before the market-oriented reforms.

1. Introduction

Green space, as a key ecological factor of the built environment, has many acknowledged economic and ecological benefits including improved air quality, mitigating the urban heat island effect, increased provisions of recreational opportunities, enhanced aesthetic value, promoting physical and mental health and encouraging people's sense of spiritual well-being (Byrne & Wolch, 2009; Byrne, Wolch, & Zhang, 2009; Hughey et al., 2016; Wolch, Byrne, & Newell, 2014; Xiao, Li, & Webster, 2016, Floyd & Johnson, 2002; Nowak et al., 1996). Most studies contend that within cities, green space is not always equitably distributed, and people's access is often highly stratified based on income, ethno-racial characteristics, age, gender, (dis)ability, paucity of political power and other axes of difference (Byrne et al., 2009; Lineberry, 1977; Mcconnachie & Shackleton, 2010). In this vein, the uneven accessibility of urban green space has become recognized as an environmental justice issue to both scholars and governments. There is a growing literature on the social equity of green space, which examines the distribution of green space resources in neighbourhoods with varying degrees of socio-economic status (SES) or racial/ethnic composition (Byrne, Lo, & Jianjun, 2015; Chang & Liao, 2011; Hughey et al., 2016; Ibes, 2015; Jacobson, Hengartner, & Louis, 2005; Landry & Chakraborty, 2009; Mcclintock, Mahmoudi, Simpson, & Santos, 2016; Talen, 1997; Yasumoto, Jones, & Shimizu, 2014).

Despite the relevance of environmental justice to the sustainable development of Chinese cities, so far there exist little empirical evidence in urban China (Wolch et al., 2014). Existing research on inequality in urban China have mostly studied the equity between different social groups in terms of employment opportunities and

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living conditions (Fan, 2002; Logan, Fang, & Zhang, 2009; Wu, He, & Webster, 2010; Wu, 2002, 2004). Furthermore, although urban parks are regarded as an urban planning priority, it is largely unknown whether this resource is equitable distributed in China. The little evidence available so far infers that access to urban green spaces in China's megacities is worsening (Chen & Hu, 2015). The social inequality literatures show that the transition of China's economy has transformed a society once characterised by egalitarianism into one that is experiencing an increasing income gap between the rich and the poor (Logan, Bian, & Bian, 1999; Sicular, Ximing, Gustafsson, & Shi, 2007; Wu, 2004). Increasing social inequality is also reflected in the residential distribution of residents as studies reveal that the residential segregation in Chinese cities is mainly based on tenure and socio-economic factors (Li & Wu, 2008). So far evidences indicate that high-income households tend to rely less on public services as they live in privately serviced neighbourhoods (Li, Zhu, & Li, 2012; Shen & Wu, 2013). Disadvantaged groups such as rural migrants and low-income households congregate in the rented sector largely consisting of older settlements and dilapidated inner-city neighbourhoods (Li & Wu, 2008; Liao and Wong, 2015; Wang, Zhang, & Wu, 2015; Wang, Zhang, & Wu, 2016a,b). The increasing spatial segregation between the affluent and the poor therefore intuitively raises the concern whether the provision of public resources such as access to basic infrastructure is equitable. The findings would also have important implications for municipal decision-making in service allocations and resource distribution in against the context of developing countries such as China.

Consequently, the aim of this study is to assess whether and to what extent the distribution of urban park services is equitable for the marginalised population in urban China. We chose Shanghai as our case study, since it is the largest and most prosperous Chinese city, which is also experiencing serious residential segregation problems (Li and Wu, 2008; Wu & Li, 2005). Compared with most extant urban China studies, which largely rely on national census data at the sub-district level, our study makes use of fine resolution population data at the *juweihui*, (residential committee) level from the 6th census of 2010. This would allow us to take into account the variations of spatial characteristics at the local level. A further strength of this study is that we adopt the accessibility measurement approach from Talen (1997, 1998) and Talen and Anselin (1998), since the traditional 'container' approach divides a particular urban area into smaller zones, such as neighbourhoods or census tracts, which fails to consider people's self-movement and spatial externalities of facilities (Nicholls, 2001; Talen & Anselin, 1998). Moreover, we use the local indicators of spatial association (LISA) method (Anselin, 1995) to examine the association between the distribution of public parks and the spatial congregation of different social groups. The advantage of the LISA method is that it can identify the local association between an observation and its neighbours, and visualize their interaction patterns over space, in the forms small clusters or insignificant outliers (Anselin, 1995).

The paper is structured as follows: part two reviews the existing discussion regarding the social equity and environmental justice of access green space. Furthermore, we examine the existing research on social inequality in urban China, in order to develop our theoretical framework. Part three explains the methodology adopted in this study and our data sources. Analysis and results are presented in part five and the final section provides a summary of key findings and important policy implications.

2. Social equity and access to urban green space

The issue of equal access to public services has become important for governments due to growing concerns in practical policy making (Brambilla, Michelangeli, & Peluso, 2013; Hastings, 2007; Tsou, Hung, & Chang, 2005). There is a long tradition of studying the distribution of urban service delivery in the context of social equity and environmental justice, including playgrounds (Witten, Exeter, & Field, 2003), parks (Chang & Liao, 2011; Crompton & Lue, 1992), street trees (Landry & Chakraborty, 2009), amenities (Lowe, 1977; Tsou et al., 2005) and public transit connectivity (Jacobson et al., 2005; Welch & Mishra, 2013). Parks and open green space, as a fundamental element of the built environment and as a basic public service provided by the government, is therefore a key target for research (Besenyi et al., 2014; Boone, Buckley, Grove, & Sister, 2009; Floyd & Johnson, 2002; Xiao et al., 2016). The core concern from an environmental justice perspective, is the spatial distribution of public goods and services, and most importantly, whether this distribution is in accordance with the varying needs of different social group's socio-economic status, ethno-racial characteristics, age, gender, (dis)ability, paucity of political power and other axes of difference (Lineberry, 1977; Byrne et al., 2009; Mcconnachie & Shackleton, 2010; Harvey, 1973; Jacobson et al., 2005). The notion of *geographies of need* by Harvey (1973) suggests that localities with a larger presence of disadvantaged residents are in need for better access to public services and goods.

Existing findings have been largely mixed in terms of the direction and magnitude of the association between green space distribution and marginalised social groups (Hughey et al., 2016; Wolch et al., 2014). Earlier research indicates that areas with a higher share of marginalised residents, are not disadvantaged with respect to the spatial allocation of public facilities such as urban parks. For example, Lineberry (1977) asserted that poorer neighbourhoods are in fact favoured in terms of park distribution. Mladenka and Hill (1977) found no particular discrimination against low-income neighbourhoods. Moreover, in Chicago Mladenka (1989) found that race was not a determining factor of park facility distribution, though social class could possibly be a determinant. Instead, it is argued that the determinants of social equity specifically regarding public facilities are more exposed to bureaucratic and professional decision-making processes (Koehler & Wrightson, 1987).

Recent studies disagree with the 'unpatterned' occurrence of inequality. Instead, several researchers found that the patterns of race and area poverty have become significant determinants with regard to access to park facilities, with evidence existing for several countries. For example, Talen's (1997) study on park accessibility and race in the cities of Pueblo, Colorado and Macon, Georgia found that ethnic minorities were more likely to be living in areas with lower levels of park access. With regards to area poverty, Erkip (1997) revealed that access to parks and recreational facilities in the city of Ankara is mainly dependent on individual's level of income. Jones, Brainard, Bateman, & Lovett (2009) examined the distribution of access to parks among the residents of Birmingham, England and found evidences of disparities in provision related to socioeconomic deprivation. Wolch, Wilson, & Fehrenbach (2005) and Sister, Wolch, and Wilson (2010) found that communities with Latinos, non-white or low-income groups have worse access to parks in the American context. Landry and Chakraborty (2009) investigated the environmental equity of 'green resource-street trees' in Tampa, Florida and identified that their spatial distribution is inequitable with respect to race and ethnicity, income, and housing tenure. In the city of Yokohama, Japan, Yasumoto et al. (2014) adopted a longitudinal approach to investigate the association between socio-demographic indicators and public park provision over an eighteen-year period, and found that new parks are located in more affluent communities. Moreover, recent studies drawing upon the concept of environmental justice contend that more focus need to be placed on how and why people use urban parks (Byrne & Wolch 2009). In this regard, Hughey et al. (2016) examined the