What determines the use of urban green spaces in highly urbanized areas? – Examples from two fast growing Asian cities

Abstract
The use of urban nature and its correlation with socio-economic and cultural conditions of urban dwellers were subject to a multitude of scientific studies in the last years. Nature and green spaces were found important for relaxing, mental restoration, playing sports and physical activities or simply for being outside together with people. Until now, less is known about spatial settings as determinants for green space use in fast growing major agglomerations in the developing world. Comparative case studies from developing countries could help consolidate a general hypothesis that people living in the same spatial setting (e.g. a highly urbanized city) use urban green spaces and prioritize specific green space facilities in a similar way regardless of developed or developing country. This study addresses this hypothesis by using a questionnaire survey for understanding peoples' use of urban green spaces in Karachi, Pakistan and Ho-Chi-Minh City in Vietnam.
Questionnaire surveys identified perception of and activities in urban green spaces in both cities. In Ho-Chi-Minh City 118 questionnaires were valid for analysis. In Karachi 315 questionnaires were analyzed. Our study shows that the main reason for visiting green spaces is walking and spending time with friends and family. This is mostly done in larger groups for picnics. We also show that accessibility of green spaces is a clear driver of their use by residents. Additionally, residents highlighted the need for urban green spaces but criticized their design and that green spaces lack of basic facilities such as benches or toilets in both cities. Results, thus, partly verify the initial hypothesis, because some green space activities and expected facilities are similar and some are different in

developed compared to developing countries. The differences may result from cultural or religious influences and help to broaden the knowledge base on the use of urban green spaces in fast growing Asian cities.

Introduction

A large number of studies have related the use and perception of urban green space to the socio-economic conditions of residential populations, in both developing and developed countries (Bonauioto et al., 1999, Carp and Carp, 1982, Crow et al., 2006, Tyrväinen et al., 2003) – however see Qureshi et al. (2013) for contradicting results from Karachi, Pakistan. Similarly, while it has been reported that man-made natural environments are much more appreciated in cities (Breuste, 2004), a few case studies have shown that people prefer a natural environment in its original form (e.g. mother nature/untouched/wild, Hartig, 1993, Smardon, 1988). Taken together this implies a strong demand for urban green spaces across the globe (Tajima, 2003) asserting a sense of place among people regardless of cultural or spatial backgrounds (Born et al., 2001, Wilson, 1997). This inspired us to the general hypothesis that urban green spaces are similarly used and perceived in the developed and developing world.

It has been shown that urban green spaces provide a range of benefits to city residents (Haase et al., 2014, Kabisch et al., 2015, Milcu et al., 2013). In developed countries the use of urban green space has been characterized by a strong social component such as by practicing sports, playing with children or meeting other people (Chiesura, 2004). The type of use has been attributed to social properties of the users such as using playgrounds with children or walking a dog as well as to properties of the green spaces such as size and to the configuration of green spaces in the cities (Schipperijn et al., 2010). Physical activities have been found to be related to properties of the green spaces such as trees, water, and lights (Schipperijn et al., 2013), while the effect of accessibility of green spaces had mixed effects (Hillsdon et al., 2006, Kaczynski et al., 2009). Use of urban green spaces also differs across developed countries: in northern Europe, green areas are appreciated as spaces of physical activity being located

within a walkable distance (Nielsen et al., 2012, Toftager et al., 2011) while a comparative study in Europe (Priego et al., 2008) showed that respondents in Chile and Germany preferred public parks or gardens, whereas respondents in Spain preferred taking walks along tree-lined streets.

Similar to studies in developed countries, a study in Malaysia – classified as a developing country – identified that the use of urban green space is primarily determined by engaging in physical activities such as jogging or walking but also in relaxation (Maruthaveeran, 2010). Suitable pathways, playgrounds and pleasant green areas but also security installations and improved lightings were named as most important green space features to visitors. The importance of safety in urban green spaces in different parts of the world has been stressed further in a systematic review by Maruthaveeran and Konijnendijk van den Bosch (2014). In addition, accessibility of green spaces in fast growing cities of developing countries is often limited (Dony et al., 2015, Lee and Hong, 2013). It is determined by public transport development or depends upon the family's access to private transport. In some cities such as in Karachi, higher quality green and recreational spaces are dispersed across and beyond the city with poor connections to public transport. Qureshi et al. (2010b, 194 with reference to Matsuoka and Kaplan, 2008) critically discussed the connection between “accessibility, long distances, and also entrance and traffic costs”.

Although urban green spaces are appreciated as important parts of the urban landscape in cities of developing countries, green spaces are at the same time considered as the most overused element (Williams et al., 2009) due to a high demand for land for residential and commercial purposes and exponential population growth (McDonald, 2009). There is increasing pressure on the use of open space and brownfield sites for the purpose of constructing skyscrapers to accommodate growing populations, together with multi-story shopping centers. The strongest pressure on green spaces is found in the rapidly urbanizing areas in developing countries (Fanan et al., 2011, Jim, 2013, Qureshi et al., 2010b).

The nexus of rapid urbanization and associated complexities with social and ecological systems has been critically discussed in both academic research and policy making (Chen et al., 2006, Folke, 2006, Gandy, 2004, Kabisch, 2015, Marcotullio and Solecki, 2013). In Europe, more than 70% of the people already live in urban areas, although growth rates are declining (United Nations, 2012). Developing countries, however, are expected to grow even faster in coming years (Grimm et al., 2008, United Nations, 2014). Although the percentage of people of developing nations living in urban areas is lower in Asia (currently ~45%) than in Europe, this is going to change soon. Growth rates of approximately 2% will certainly urbanize developing countries with the prevalence of more megacities. Rapid urbanization in developing countries will likely be characterized by different patterns and processes of land use change compared to the development in the developed countries.

A unique property of Asian cities is that they act as a hub for a large population living in slum areas and squatter settlements (Qureshi et al., 2010a, Subbaraman et al., 2012). Furthermore, Asian cities show special dynamics of urbanization, characterized by specific landscape patterns, uneven demographic densities, severe traffic and related environmental problems and their consequences (Satterthwaite, 2008). Discussing urbanization in Asian cities also means discussing "unprecedented urbanization", which means a much faster urban transition compared to other regions worldwide (Pho, 2012).

The global trend to increase settlement and built infrastructure at the cost of former green areas without a proper replacement of lost green areas prevails significantly (Crane and Kinzig, 2005), except in some cases where a moderate balance between built-up structures has been observed along with appropriate green infrastructure (e.g. Zhao et al., 2013). Urbanization continues to extend its footprint on urban green space (Moriniere, 2012) primarily because public authorities have been ineffective in developing and maintaining appropriate green spaces in and around cities, particularly in developing countries (Jim, 2013). The problem is triggered by a lack of

vision and interest by authorities toward such issues. This disproportional development between gray (settlement and built infrastructure) and green areas in Asian cities can be expected to challenge city dwellers seeking those services provided by urban green areas. Not only does rapid urbanization result in stressed ecological regimes within cities, but traffic systems are also under continuous pressure, limiting the safe and quick maneuvering of residents within the city (Mehdi et al., 2011), thereby reducing accessibility of green spaces (Dony et al., 2015, Lee and Hong, 2013). All of these issues – the unprecedented urbanization, the disproportional development between gray (settlement and built infrastructure) and green areas and the somewhat chaotic traffic systems – pose great challenges to urban planners when aspiring for the provision of healthy living surroundings (Coles and Millman, 2013).

To obtain more insight into the use of urban green spaces and the residents' preferences for green space facilities in fast growing cities in developing countries, we address the following research questions: How are urban green spaces used in the context of rapid urbanization in Asian cities, and which barriers may prevent residents from using urban green spaces? Two Asian cities – Ho Chi Minh City (HCMC) in Vietnam and Karachi in Pakistan – are analyzed in this paper. The cities were selected because of their unique yet changing land use pattern, demographic characteristics and rapid immigration from rural toward urban areas.

Section snippets

Karachi (Pakistan)

Karachi is a coastal megacity and the economic capital of Pakistan. The city generates more than 60% revenue of the country's total gross domestic product (GDP). Its high economic importance is primarily due to its important geostrategic location at a port and its longstanding connections to China's export market. The city has seen immense demographic growth (Table 1) accompanied by exponential spatial sprawl. The current estimated population is approximately 23 million with a density of

Respondents' demographic profile

Concrete information on the respondents' demographic profiles for the two case studies is provided in Table 3. In HCMC, approximately half of the respondents were 21 ≤ 26 years old. This is plausible good representation of the population, as the median age in HCMC was 28.7 in 2009 and is projected to be 30.7 years in 2014 (Ministry of Planning and Investment: General Statistics Office, 2011b: 286). The number of people interviewed in older age groups decreased by age. Only 7.6% of the samples

Discussion

Our study gave an insight into the types of green space preferred by residents in HCMC and Karachi. Overall the preference for a certain type of green spaces and the pattern of usage was more related to cultural and religious influences than to urban structures and growth dynamics. Growth dynamics seem not to determine the preference for a certain composition or character of a green space. Instead, they result in barriers of green space use.

Our results partly contrast with our hypothesis as

Conclusion

In this paper, we assessed the use of urban green spaces in the context of rapid urbanization in two fast-growing Asian cities – Karachi and HCMC. We presented the results from questionnaire surveys and discussed them according to the findings and experiences from similar studies performed in developed and developing countries.

Concerning our initial hypothesis regarding green space use, the results of using and perceiving urban green space in Karachi and HCMC were partly similar to the cases

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