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Meeting critical challenges and striving for urban sustainability in China

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\textbf{Abstract}

China has experienced outstanding economic growth during the last three decades through urbanization. But at the same time, many ecological and social issues have been marginalized, leading to problems in public safety, health, and social equity. Such a pattern of development is unlikely to be sustainable. In this article, we examine these issues and the challenges that come with resolving them, and advocate a holistic and pragmatic approach to the research and practice of urban sustainability in China.

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1. Introduction

China has experienced rapid urbanization since its reform process started in 1978. Its urban population increased from 17.6\% in 1978 to 46.6\% (about 620 million) in 2009 (Niu and Pan, 2010). The trend of rapid urbanization is expected to continue as urbanization is considered an “engine” of economic growth (Sha et al., 2006), and indeed “accelerating urbanization” has been set as a national policy for the years to come (12th Five-Year Plan, 2010). With the prosperity brought by rapid urbanization, however, come issues pertaining to public safety, health, and social equity in the urban areas that, until recently, have yet to receive the attention they deserve.

Recognizing the critical importance of these issues to urban sustainability, the Shanghai Key Laboratory for Urban Ecology and Sustainability (SHUES, thereafter) in China has identified public safety, health, and social equity as three areas of strategic emphasis in its research, education, and outreach activities. With its prominent location in China’s largest urban region, SHUES is obligated and committed to the pursuit of urban sustainability through a holistic and pragmatic approach. In this essay, we elaborate on the defining characters of such an approach within the syntax of the challenges scholars and practitioners face in dealing with public safety, health and social equity issues in China.

2. Critical issues to urban sustainability

2.1. Public safety

Public safety in the highly populated urban areas has caught national attention in recent years, unfortunately, due to disastrous events. A recent example was on November 15, 2010, when a 28-story apartment building in the central city of Shanghai caught fire, causing 58 fatalities. Fire trucks had difficulty reaching the building due to narrow fire lanes, and the height of the building further hindered the rescue attempt. On August 8, 2010, a mudslide hit the densely populated town of Zhouqu County, Gansu Province in Northwest China (about 50,000 people in an area of 1.47 km\textsuperscript{2}), and took more than 1400 lives. The high number of casualties in these events was due largely to the concentration of residents without adequate emergency response equipment, personnel, and protocol.

The situation is worsened by China’s physical geography. China is situated at the juncture of two major earthquake zones, the circum-Pacific seismic belt and the Mediterranean and trans-Asiatic zone, and is constantly under the threat of major earthquakes. The high concentration of population in areas prone to earthquakes adds a significant safety risk, as does land subsidence in coastal cities, which has been accelerated by urbanization. In Shanghai, cumulative subsidence has been recorded at 2–3 m in the central areas, contributing to safety hazards from flooding and damage to the city’s infrastructure, including roads, buildings, subway tunnels, and sewerage system (Chai et al., 2004).

2.2. Public health

Public health in Chinese cities has also emerged as an issue of prominent importance. Densely populated cities tend to be the most vulnerable to the spread of infectious disease due to the number of citizens in close proximity. This became apparent for China
with the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003. China experienced an epidemic situation with SARS, and the majority of infection cases were found in high-density areas such as Beijing and Guangdong province. Additionally, urban residents' daily lives were seriously affected by the fear of entering public places and having contact with those who may or may not have SARS.

Environmental degradation associated with urbanization processes presents yet another threat to public health as many of the pollutants that degrade the environment can cause illness to the human population. Nearly half of China's population that lives in the Huang, Huai, and Hai River basins are faced with a shortage of clean drinking water because more than 70% of the surface water in the basins is polluted (Wang et al., 2007). In the economically prosperous Yangtze River Delta, high levels of air pollution, acid rain, and soil contamination constitute major threats to the public's health (Gu et al., 2008) and can contribute to respiratory illness and food contamination.

2.3. Social equity

Social equity is another critical issue that has had unintentional consequences under the national priority of urbanization. One such case is the disparity between urban and rural areas. Cities are quickly developing, while rural areas are developing more slowly, causing a gap in income. This income gap keeps increasing, leading to a vast migration from rural to urban areas. Such migration has caused loss of labor, lower domestic demands, and a weak market in the large rural areas (Sha et al., 2006). Additionally, owing to the longstanding household registration system of ‘Hukou,’ which classifies citizens into urban and rural residents, rural migrants to cities have reduced access to education, health care, and social security resources. On the other hand, urban residents are routinely relocated, despite their unwillingness to move, to allow for redevelopment in the center city, often without being well compensated (Tu and Shi, 2006).

3. Challenges on the path to urban sustainability

China's efforts to deal with the issues of public safety, health, and social equity face many challenges, three of which are discussed here. The first and foremost is the large population. As the most populous country in the world, 620 million of its 1.3 billion people live in urban areas. Meeting the basic human needs for safety and health of such a large population is an immense undertaking in its own right, without adding in social equity concerns. In this case, these issues are multiplied along with the population, increasing the complexity of the issues.

The second challenge is the tradeoff among economy, environment, and equity—the three pillars of sustainability. To sustain the life and well-being of its population, China has indisputably set economic growth as its first priority. However, the predominant emphasis on gross domestic product (GDP) growth (Sha et al., 2006) has contributed to a development pattern that focuses on short-term economic gains at the detriment of social equity and the environment. For instance, the legally required environmental impact assessments (EIAs) of many development projects are perfunctorily performed, or even bypassed, to ensure tangible GDP growth (Tu and Shi, 2006). Investment only in high-paced, high-density development may lead to more safety and health concerns if there is inadequate investment in public services, such as emergency responders, emergency management equipment, and public health monitoring programs.

The third challenge comes from the transition China has been making from a planned to a market economy. Since the late 1970s, China has taken giant steps to transform a centrally planned economy to a government-regulated market economy. Yet, its centralized administrative system remains relatively unchanged (Tu and Shi, 2006). As such, many policies created during the planned economy era, such as the “Hukou” system, remain active, and to a large extent, hinder the progress toward improved social equity in urban sustainability.

4. A holistic and pragmatic approach to urban sustainability in China

In light of the challenges addressed above, what are the general principles for urban sustainability that will assist scholars and practitioners dealing with the issues toward urban sustainability in China? In this essay, we advocate a holistic and pragmatic approach that has the following characteristics.

4.1. Pragmatic sustainability

Each urban area is a unique entity and its history and identity, as well as its political and social characteristics, should be respected in light of the challenges to urban sustainability. As such, the widely accepted definition for sustainability (WCED, 1987) — satisfying the present without compromising the future — should only serve as a general framework and be adapted to the unique characteristics of each urban area. A pragmatic approach to sustainable development that recognizes each city's distinct characteristics and continually adapts to changing conditions in public safety, health and social equity should be advocated and adopted (Moore, 2010).

4.2. Human–environment interactions

Integral to urban sustainability are the relationships between the people, the built environment, and the natural environment—three functionally interconnected and spatially coupled components of urban systems (Wu, 2008). The dynamics among these components affect public safety and health directly, and contribute to overall social equity. It is therefore appropriate and useful in urban sustainability research to view an urban area as a coupled human and natural system (CHANS) (Liu et al., 2007) with a focus on the interactions and harmony among its three components. Only through such a holistic perspective can the interactions among these three components in urban areas be fully understood.

4.3. Responsible regionalism

Public safety, health, social equity, and other issues pertaining to urban sustainability are not contained within cities' boundaries. The challenges that come with resolving them do not respect these boundaries either. The study of urban sustainability should therefore embrace the network of places that may be interconnected by economic, commercial, political, diplomatic, or even epidemiological connections. Similarly, urban sustainability ought to be placed within a broader regional perspective so as to achieve local goals without hindering achievement in other areas (Berke and Manta, 1999). While the cities focus on pursuing sustainability through their own development, care should be taken to ensure that no action within the city causes harm to other areas.

4.4. Transdisciplinary and collaborative processes

The complexity involved with the critical issues and challenges of urban sustainability in China demands a transdisciplinary and collaborative approach. While each issue is complicated within itself, the coupling of some or all of them dramatically increases the intricacy of urban sustainability research. As the traditional
divide-and-conquer approach cannot adequately deal with these complexities, a transdisciplinary approach that emphasizes collaboration is in order. Under this approach, experts from different disciplines work together with stakeholders and government officials to fuse their ideas and explore creative new solutions to these complex issues. Similarly, the solution to public safety, health, and social equity issues also requires a participatory and collaborative process. Many public health measures, such as pandemic prevention, waste treatment, and solid waste management, cannot take effect without regional, national or even international collaborations.

5. Conclusions

“Better city, better life,” the motto for the 2010 World Expo, held in Shanghai, best expresses the human dream for urban sustainability. Today, with its unprecedented urbanization and rapid economic growth, China is leading its people toward a more prosperous future. Along with continued development are critical issues and challenges that potentially hinder the country’s sustainability. In this essay, we advocate a holistic and pragmatic approach to the research and practice of urban sustainability in China. It focuses on relationships among the human communities and their natural and built environments in urban areas; pursues a harmony among these components in dealing with the three issues of public safety, health, and social equity; embraces regional differences; and encourages collaboration and participation. SHUES will adopt this approach to explore pathways toward urban sustainability, and with a program of research, education, and outreach, to contribute to the current efforts the country is making toward its goals. With one-fifth of the global population, a sustainable China will not only benefit its own people, but will also contribute to the general well-being of the world.

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