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### Urban Climate Science for Planning Healthy Cities in Asia

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#### Abstract Text:

Since 2006 more than half of the world's population have become urban dwellers (UNFPA, 2007). Furthermore by 2030, nearly 60% of humanity will live in cities and almost 9% of the world's population will be living in just 41 megacities (UN, 2008). The rise of mega- and high-density compact cities are now irreversible trends of human urban development, especially in Asia (UNFPA, 2009). While Megacities and high-density urban living may make lives more convenient and society more economically efficient (Ng, 2009, 2012) they pose a range of environmental challenges, especially as increasingly dense, complex and interdependent urban systems leave cities vulnerable (WMO, 2012,2016) and sensitive to climate variability and change (Grimmond, 2010). Climate threats come mainly in the form of poor air quality (WMO,2012), wind storms, heat waves, drought and floods. Flowing from these are a range of possible health impacts including death, physical injury, heat-related illness, vector and waterborne disease and mental illness (Grimmond, 2010; WHO, WMO& UNEP, 2003; WMO, 2016). The visibility of how climate affects cities and their infrastructure and inhabitants have generated wide-ranging concern from both the general public, local and national governments and international agencies. This 'climate of concern' has very much led to the emergence of the call for climate resilient and healthy cities especially as minds become focused on how climate change may have fundamental influences on how cities might have to plan for the future.

The study of urban climate has been developed since the nineteenth century due to the anthropogenic climate modification in the cities caused by global industrialization and urbanization process, with the focus to investigate the urban climatic phenomena such as urban heat island, urban energy budget, air pollution dispersion and urban ventilation (Landsberg, 1970; Stewart & Oke, 2012). The urban climate has great impacts on cities and their populations in terms of thermal comfort, air quality and wind environment. Although the research studies in the field of urban climatology have been largely expanded in the last two decades, the impact of urban climate knowledge in the urban planning and design practice is still very low (Eliasson, 2000), especially in Asian developing countries, like China(Ng & Ren, 2017).

The author will share her practical experience by introducing several governmental consultancy projects she involved and led in Asian high-density cities including Hong Kong (Ng, Ren & Katzschner, 2012), Macau, Wuhan (Yuan, Ren & Ng, 2014), Changchun (China) and Kaohsiung (Taiwan) (Ren, et al, 2013). The presentation will not only look at the ways of urban climatic application methodologies and strategies (Ng & Ren, 2015), but also introduce the practical experience of application-based guideline development. For example, the new China National Technical Guide on 'Urban Climatic Consideration in City Master Plan' has been recently developed. Its focuses are urban ventilation assessment and wind corridor plan, urban greenery and thermal environment, allocation of industrial areas, renewable energy resources, rainfall and sponge city development, and as well as extreme events and corresponding anti-measures. It not only provides suggestions on data collection, methodology but also touches planning implementation and technical report preparation. The presentation will illustrate the idea of "Science in Time, Science in Place" and explain how to deliver a cross-disciplinary collaboration bridge the scientific world and the community of practice.

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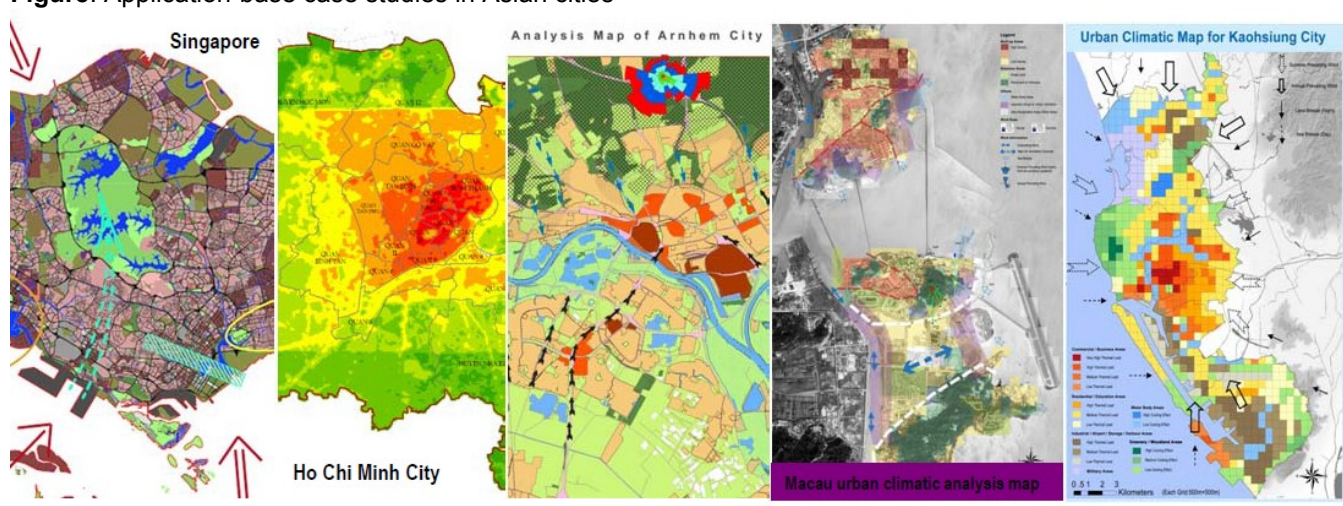
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**Figure:** Application-base case studies in Asian cities



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