Infrastructure opportunities for the resilience of tomorrow's cities

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The world evolves. Cities have become the most common human settlement (>50% world population is urban). They act as major centres of economic activity and innovation, but also as hubs of crucial challenges. Cities are increasingly complex systems which have to address the enhanced demand, as well as sustainability criteria (e.g. meeting the 2015 Paris Climate Agreement target). Cities are also increasingly suffering from the impact of extreme weather, which are expected to threat US$4 trillion of assets by 2030 [1].

Science evolves too. New technology (e.g. Internet of Things) and concepts (e.g. smart cities) are emerging to manage risks and develop strategies for climate mitigation and adaptation. Infrastructure plays a core role in developing urban resilience, since they underpin all the key activities and constitute the backbone of a city. When infrastructure is robust and able to adapt, the whole city becomes less vulnerable to natural disasters.

Yet urban research does not fully fulfil the need of decision-makers: existing studies are mostly silo-based (e.g. based on single disciplines), or provide little scope for a business case, or do not offer platforms of practical implementation. Also, the uptake of developed technology (which requires specific expertise) is sometimes difficult and seen as a further barrier.

This award lecture will review the major challenges that cities are facing today, and illustrate available tools to assess impact to infrastructure, alongside adaptation and technology options. Various international case studies will be presented regarding flooding and road networks [2, 3, 4, 5].

In the future, research and practice needs to interlink to innovate urban policy for mitigating urban climate change and adapting. Cities have never had so many and powerful tools available to tackle their challenges: while there is an immense potential, its realisation is still to unfold. The next decades are critical for developing schemes that address climate and sustainability goals, which could be solely successful with the application of latest science to practical contingencies.

Reference


