Guest editorial

Invisible cities, visible risk

> In the center of Fedora, that ray stone metropolis, stands a metal building with a crystal globe in every room. Looking into each globe, you see a blue city, the model of a different Fedora. These are the forms the city could have taken if, for one reason or another, it had not become what we see today. […] The one [stone city] contains what is accepted as necessary when it is not yet so; the others [model cities], what is imagined as possible and, a moment later, is possible no longer (Italo Calvino, Invisible Cities, 1972).

In novels and movies, as well as in psychoanalysis, cities have often been described as manifestations and enablers of dreams, as imagined spaces and relationships. In Italo Calvino's *Fedora*, a series of models of one and the same city are conceived over time, but while each of the models is created in the image of an ideal city, Fedora – the city of unfinished desires – continues to change, to an extent that makes all those ideal futures impossible (Figure 1).

Today, the rapid development of urban spaces often happens outside of the rigid chronology of planning, budgeting and regulation. In many cities, particularly in emerging economies, unprecedented rates of speculation-driven infrastructure investments and subsequent population increase mean that administrative planning cycles and regulatory mechanisms are left behind in the face of a constant re-shaping of urban space and the creation of new cityscapes (Watson, 2014; UNISDR, 2015). Planners and regulators may be forgiven if they sometimes feel like their efforts mirror the futile attempts of Fedora's city modellers.

Moreover, the large (post-)modern city has morphed into a place that is at the same time both intensely local and aggressively global. Even smaller towns and cities with rapidly growing economies and populations display a complex mix of local identity and global characteristics. This double-entrenchment is also reflected in how disaster risk permeates urban spaces. Urban risk is generated as much by local planning and practice – or lack thereof – as it is by global investment flows, international and regional trade and policies (UNISDR, 2013). And as such it can also only be reduced by a combination of local tools and approaches on the one hand, and national and international regulation on the other.

Badly managed urban growth has been identified as a key driver of disaster risk (UNISDR, 2009, 2015; Satterthwaite and Mitlin, 2013). The *Hyogo Framework for Action* (*HFA*) acknowledged this by identifying the need to "incorporate disaster risk assessments into the urban planning and management of disaster-prone human settlements" and "mainstream disaster risk considerations into planning procedures for major infrastructure projects" (United Nations, 2005). However, the HFA focused on how unplanned urban development increased existing vulnerabilities and did not highlight as much the role that urban growth plays in creating new levels of exposure. The HFA's successor agreement, the *Sendai Framework for Disaster Risk Reduction*, fills this gap (United Nations, 2015). Even more importantly, the Sendai Framework recognises that unchecked risk accumulation in hazard-prone countries is driven by the pursuit of economic, and associated urban, growth.

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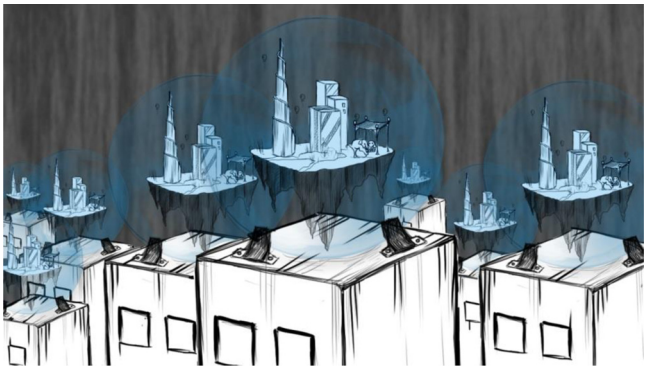

Figure 1.
Fedora – Nobonita Bhowmik, 2014[1]

Unsustainable patterns of production and of consumption create conditions of fragility while simultaneously weaving an ever-increasingly interconnected web of markets, modes of production, transport systems, supply chains and finance flows (Harvey, 2008). To use the analogy of another of Calvino's imagined cities, we may be approaching the condition of *Leonia*, the city that, by refashioning itself every day, creates "craters of rubbish, each surrounding a metropolis in constant eruption […]. The greater its height grows, the more the danger of a landslide looms". Recent images of a *river of garbage* clogging the streets of Beirut in February 2016 as a result of dysfunctional local governance are like imagined *Leonia* coming to life, reality imitating art[2].

The collection of papers in this special issue clearly identifies how cities have become hubs not only of opportunity, development and economic growth, but also of risk accumulation. In hazard-prone regions, risk has become a defining characteristic of the urban landscape – in some cases, such as the hillside settlements in Rio de Janeiro, very visibly so. In other cases, risk remains less visible until it manifests in large-scale disaster as in the case of the earthquakes in Christchurch, New Zealand, in 2010 and 2011 (Figure 2).

The first set of papers in this special issue tackles the complex processes of risk accumulation, of cascading and interdependent risks in a world of connected cities. The

Source: (Photo by Crystal Davis, World Resources Institute 2007, https://creativecommons.org/licenses/by-nc-nd/2.0/legalcode) and Christchurch, New Zealand; (Photo by Ashley Wijnants https://creativecommons.org/licenses/by-nc-nd/2.0/legalcode)

Figure 2.
Informal settlements on non-stabilised slopes in Rio de Janeiro

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intricate relationship of urban development and risk demands that an increasing focus and effort is given to understanding how new vulnerabilities and exposures are created on a daily basis by urban planning and investments. The recent spread of the *Zika* virus, by now affecting cities in more than 30 countries, is just one consequence of the interdependence of risks and creation of new vulnerabilities, disproportionally affecting the urban poor.

Showing that cities are both at risk as well as the cause of risk, *Wamsler et al.* analyse the unique dynamics of urban risk. Cities and towns develop idiosyncratic urban systems that ensure the functioning of everyday life. These systems are directly shaped by the distinct features of individual cities and yet have common characteristics of which a key one is their interconnectivity. The paper presents clearly that the prevailing tendency to see disasters as the "causes" and the destruction of the built environment as "effects" is misguided and instead, the city–disaster nexus continues to shape and be shaped by larger processes, such as climate change.

Komendantova *et al.* complement this analysis by showing how urban resilience can be understood as a capacity of systems to prepare for, respond to and recover from multiple hazards. The paper proposes a multi-risk approach that takes into consideration the interdependencies of multiple risks in urban environments and their potential to trigger chains of disastrous effects at different temporal and geographical scales.

Cities with little built-in redundancy, face particular challenges. For example, the increasing dependence of water, sewerage, waste management and health systems on electricity supply has resulted in a shutdown of these critical services during power outages associated with hazard events, such as the Akalla tunnel fire in Stockholm in 2002 or Hurricane Sandy in New York in 2012. *Kim and Haraguchi* explore the case of Hurricane Sandy from this perspective of interdependence among different sectors of critical infrastructure in New York City. Using empirical data on actual inundation from GIS flood maps of New York after the event, estimates of direct and indirect damages are calculated to assess the degree of functional interdependence among the sectors. The analysis shows the energy sector, electricity in particular, as the main connector of risk into other sectors. An issue not fully recognized even after the event, as witnessed by private and public sector focus on rebuilding individual hard infrastructures during the reconstruction phase without due diligence given to their interdependency.

McGee *et al.*, too, using a systems thinking approach, present critical infrastructures as complex systems that are part of broader societal context and disaster conditions. Empirical data on cascading effects in major disasters of the last years are analysed against the backdrop of a causal loop diagramming technique that maps the risk relationships of various effects to track pathways across critical infrastructures. The HFA did not encourage clearly enough the need to identify infrastructure interdependencies; the critical role that risk assessments that account for interrelated disasters play; and the need for the private sector to understand these dependencies and develop robust business continuity plans that account for resulting infrastructure failures.

The second set of papers presented take us into the critical area of how to better understand risk and resilience and discuss limitations to and different approaches and tools available for this. *King* highlights that land use planning systems in many countries still focus on promoting and facilitating development, economic development

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in particular and do not include a full assessment of disaster risk and climate change impact. Using case study material from Australia, Indonesia and Thailand, the paper examines the role of local planners following major disasters and find that land use planning frameworks for hazard-resilient communities remain disconnected from the dominant emergency management and disaster risk reduction systems, requiring a fundamental change to the way in which local planning is conceptualised and practised. Badly planned urbanization and relocation of people into hazard-prone areas increases the number of new residents lacking local risk knowledge and thus makes the engagement of land use planners critical to avoid the creation of new risk.

Wilkinson analyses the role of the construction sector in recovery and reconstruction. Construction organisations and companies are key economic and social actors as they provide essential infrastructure, but their physical resources, people, materials, logistics and technical and management expertise can also contribute greatly to recovery and reconstruction. This is particularly the case when the construction sector manages to improve its own resilience against disasters by integrating disaster risk management into its core business strategies and processes. The paper further analyses existing benchmarking tools and indicators of resilience, which include the assessment of intangible assets such as leadership and culture, networks and readiness to change to determine the resilience of organisations.

Murnane *et al.* summarise the technical and social components of risk assessments required for risk information to provide a useful basis for effectively managing disaster risk across a wide range of sectors. While technical components are often advanced, considerations of context are often under-assessed in current approaches and the paper details the institutional, social and political areas that should be considered to maximise the probability of successful reducing risk. The authors argue that unless end users have agreed on why the risk assessment is needed, feel a sense of ownership of the process, have access to the data used in the analysis and have a solid understanding of the results, risk information will be ignored by decision-makers.

In the context of urban risk where social and political dynamics continuously shape cities, this may be particularly relevant. If we understand cities as living and breathing organisms, we can imagine them becoming suffocated by overwhelming levels of risk, stifling investment and limiting job opportunities, creativity and social and economic development. In such settings, focused urban community interventions can act as catalysts, revitalising whole urban areas. *Cornell et al.* discuss two practical tools that allow communities and households to assess their resilience to disasters and enable them to increase or maintain these levels. A community resilience scorecard and a corresponding toolkit, both tested in communities in Australia, are presented and shown to be valuable tools for communities to start setting priorities, allocate funds and develop emergency and disaster management programmes that build local resilience. Such initiatives, rather than imposing large-scale structural investments or risk transfer schemes, operate almost as disaster risk management *acupuncture*[3] and may be an effective way of disaster risk management today.

Finally, the paper by *Vulturius et al.* explores how disaster risk reduction and climate change adaptation can create synergies based on their differences and similarities to tackle the underlying drivers of disaster risk. Drawing on a review of literature of disaster risk reduction and adaptation, the study finds that climate change is a key driver of dramatically increasing disaster risk in many parts of the world. The authors

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suggest that a greater emphasis is required on addressing and effectively reducing vulnerability to environmental hazards in the future; something that is clearly reflected in the Sendai Framework for Disaster Risk Reduction.

The papers presented in this special issue are only a selection of a large number of contributions developed for the 2015 edition of the United Nations Global Assessment Report on Disaster Risk Reduction[4]. They all contribute to a strengthened understanding of the processes of disaster risk accumulation and reduction within the built environment. And they ask us to seek new ways of thinking about and addressing urban risk. While media attention may still be preoccupied by the simulacra of fat-tail events, many of the findings presented in these papers point us to the pressing reality of extensive risk. If countries are serious about meeting the Sustainable Development Goals (SDGs), particularly Goal 11, *Make cities and human settlements inclusive, safe, resilient and sustainable*, both extensive risk, associated with local floods, landslides and fires, and intensive risks will have to be reduced.

In Italo Calvino's novel, Marco Polo's imagination opens up an alternative to the way we think about cities. Free of the limitations set by the physics of law and economic realities, the reader is invited to interpret what is being said and imagine new urban spaces. Reducing risk and meeting the goals and targets of the Sendai Framework and the SDGs will not be possible by ignoring physics, economics or even politics; however, this is the time to re-imagine urban development. The level of interconnectedness of global economies and the dynamics of international investment flows can seem to defy the laws of urban planning. In such a scenario, the resulting creation of high-risk realities for large parts of the urban population can be difficult to control by local authorities. Prospective, i.e. forward-looking, truly anticipatory disaster risk management that enables accountability and strengthens local governance – as suggested in several of the papers presented here – can be a practical tool to address this challenge and turn into an opportunity for sustainable development.

Bina Desai, Rhea Katsanakis and Andrew Maskrey
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Notes

1. The authors gratefully acknowledge the artist's kind permission to reprint her artwork. For more information visit: www.nobohb.com
2. Available at: http://de.reuters.com/news/picture/beiruts-river-of-garbage?articleId=UKRTX28A4W (accessed 3 March 2016).
3. Comparable to the concept of "urban acupuncture", which has gained traction in recent decades (Moneo *et al.*, 2013; De Sola Morales, 2008; Unt and Bell, 2013).
4. For all Background Papers developed for the 2015 Global Assessment Report, please see: www.preventionweb.net/english/hyogo/gar/2015/en/home/documents.html

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