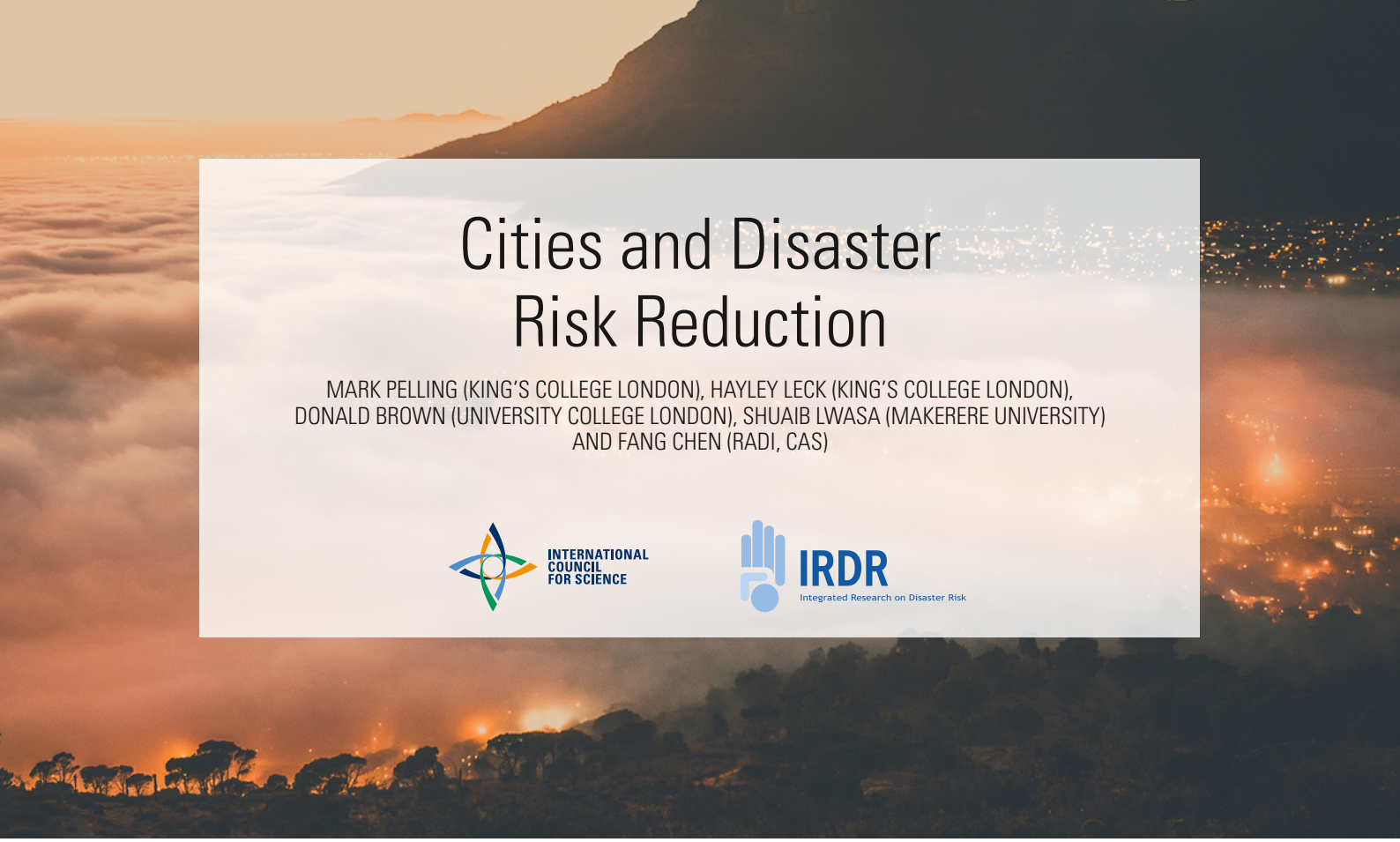

Cities and Disaster Risk Reduction

MARK PELLING (KING'S COLLEGE LONDON), HAYLEY LECK (KING'S COLLEGE LONDON), DONALD BROWN (UNIVERSITY COLLEGE LONDON), SHUAIB LWASA (MAKERERE UNIVERSITY) AND FANG CHEN (RADI, CAS)

INTERNATIONAL COUNCIL FOR SCIENCE

IRDR
Integrated Research on Disaster Risk

POLICY RECOMMENDATIONS

- Urbanization means that the implementation of the Sendai Framework for Disaster Risk Reduction (SFDRR) will depend increasingly on what is done to reduce risk in urban areas, but better data and more action at the local level are required.

- The future challenges facing urban disaster management will be increasingly concentrated in low- and middle-income countries, where most future urban growth is set to occur, but where the capacity to plan and manage rapid urban growth and adapt to emerging hazards (including climate change) is often lacking. Investment here is a priority.

- Smaller cities are increasingly important priorities given their demographic importance and especially weak capacity. Investing in capacity to monitor and manage risk in cities of one million or less inhabitants will likely have the greatest aggregate impact on disaster reduction.

- Disaster management must broaden its focus to address every day, small and large events, from chronic environmental health through frequent but low-impact hazards to extreme events. This will require new approaches to risk reduction that link with development, for example by combining environmental health, access to basic services and efforts to prepare for, and respond to, extreme events.

- Urban planning in many parts of the world, but particularly in developing regions, has become increasingly disconnected from contemporary urban challenges linked to rapid urbanization, poverty, informality, spatial fragmentation and climate change. New and more inclusive approaches to urban planning such as citizen-led planning fora and locally controlled disaster reconstruction are required if urban growth is to contribute to a more sustainable future for all.

- The SDFRR can enhance processes to democratize science as part of a widening of participation in the shaping of urban futures. This will require bringing science and policy actors together in the production of data and knowledge on urban risk. Urban grassroots actors have sophisticated technical capacity and can play a key role in shaping policy, and providing data and experience[1].

1 SDI is a confederation of grassroots collectives formed by the urban poor to gain access to safe and secure land for housing and basic services.

Context

"By 2050, 70 % of the world's population will live in urban areas. As cities continue to grow, exposure of lives, livelihoods and economic, social and environmental assets is set to increase exponentially. The local level is the frontline of addressing disaster risk and is where significant gains can be made."

(UNISDR, 2014).

Successful implementation of the Sendai Framework for Disaster Risk Reduction (SFDRR) will depend increasingly on what is done to manage risk in urban areas. Ongoing urbanization processes accumulate risk in cities and neighbourhoods, but are also a major opportunity space for risk reduction. Realizing the risk reduction potential of cities is guided by the SFDRR. The Framework emphasizes land-use planning and building standards (27d), insurance (30b) and mainstreaming of Disaster Risk Reduction into planning (30f and 47d). More than this, the technical priorities of the SFDRR sit alongside the broader development approach of the SDGs (including Goal 11 of 'making cities and human settlements inclusive, safe, resilient and sustainable') and the UN's New Urban Agenda (Quito Declaration on Sustainable Cities and Human Settlements for All). By combining action through these technical and developmental frameworks the needed step-change in urban risk management can be achieved. Such a combined approach has the potential to deal squarely with the root causes of risk in land-rights, social protection, environmental quality, economic opportunity and urban governance, as well as the immediate needs of risk assessment, preparedness, response and recovery.

Sustainable and resilient urban futures are not only at risk from catastrophic events. Everyday events – ranging from infectious and parasitic diseases to road traffic accidents and everyday flooding – arguably have a bigger aggregate impact on human health and wellbeing (UNISDR, 2011). It is exactly at this interface of poverty and risk that the SFDRR can contribute to shifting risk reduction toward development. This shift must necessarily entail more coordinated and programmatic approaches to urban planning and governance that recognize the potential advantages that cities and their economies of scale present for breaking cycles of risk accumulation.

Key considerations for implementation

How can cities realize their potential to become engines for global risk reduction?

For at least 15 years the argument has been made for integrating sustainable urbanization and risk management approaches (Pelling, 2003). Increasingly cities and neighbourhoods are taking up this challenge. Box 1 provides one example from Kampala, Uganda framed by an integrated Climate Change Action Plan, Box 2 illustrates a case of city learning, following flood events and a subsequent shift in urban design.

Even where city leadership is strong four key constraints impede the implementation of the Sendai Framework:

BOX 1

Integrated risk management in Kampala's Climate Action Plan

A mix of technological, ecosystem-based solutions and social-based strategies are being promoted in Kampala to reduce urban risk to floods, heat waves and health risks. The solutions are planned and implemented at various scales from plot to city-wide including planting shade trees, new drainage ponds at plot level, rainwater harvesting, productive greening and re-design of the city-wide drainage system. This integrates climate change adaptation and mitigation with disaster risk reduction.

Source: Kampala Capital City Authority (2016)

Demographic challenges

Most of the world's future urban growth is set to occur in middle- and low-income countries, particularly in Asia and Africa. North America and Europe as well as Latin America and the Caribbean are already predominately urban (UNDESA, 2015). However, middle- and low-income countries often lack the capacity to plan and manage rapid urban growth and expansion and adapt to emerging hazards

(including those linked to climate change). Of particular concern are smaller towns and cities, which are in many cases growing faster than larger urban centres, but often with especially limited capacity to reduce and respond to risk. Despite this, most attention has focused on large and mega cities, many of which are not growing especially fast, although they will remain strategic priorities given the size of their economies and populations (Brown et al. 2017).

Assessment challenges

Existing mechanisms for monitoring urban development, risk and loss do not allow for a systematic and anticipatory analysis of the influence of urban growth and investment on risk in urban centres. This is particularly the case for small to medium-size cities (Birkmann et al. 2016). In large cities with extensive informal or slum communities, data can be incomplete. Elsewhere social change driven by internal displacement, international migration, sprawl from the city centre or natural processes of demographic change such as aging, make risk and loss assessment challenging in even the most well planned cities.

BOX 2

Changing urbanization practices to reduce risk in Wuhan, China

Heavy rainfall hit Wuhan, China on 1 June 2016, resulting in serious urban flooding. There were 127 lakes in urban areas of Wuhan in 1949, but now only 38 are left because of rapid urban construction. The remaining lakes could not effectively absorb floodwaters. Now, Wuhan has started integrating its 'sponge city' DRR programme into the planning, re-design and operation of the built environment. The programme aims to allow at least 70 percent of rain to soak into the ground instead of letting it run into lakes (e.g. by developing residential communities fitted with storage tanks, and building roads, sidewalks and squares from permeable materials).

Source: IRDR China National Committee (2017)

Institutional challenges

In richer and poorer cities, informal growth and expansion is often exposing increasing numbers of urban dwellers to both everyday and catastrophic events, with the urban poor bearing the consequences. It is in these situations where there is potentially most to gain from shifting risk reduction into a development mode. However, approaches to urban planning that can address the development needs and priorities of the poorest and most vulnerable groups (particularly regarding access to safe and secure land for housing and basic services) remain elusive and the subject of debate (Watson, 2009).

Governance challenges

In many cities – rich as well as poor – planning and regulation are in retreat, with private development having an increasing voice in shaping plots, neighbourhoods and cities. Private developments can be highly responsive to risk and have foresight in integrating climate change adaptation. But this is not always the case. Collaboration between regulators, development, civil actors and science is key to balancing the diverse interests of the city.

Key considerations for monitoring progress

New indicators are needed to better understand how urbanization is shaping the social and spatial distribution of different types of urban risk. Three opportunities present themselves for overcoming existing monitoring challenges:

Enhance detailed, local data

The major national and international databases on disaster loss and damage (such as EM-DAT) are aggregated at the country level. As a result, they obscure important differences in the social and spatial distribution of risk, both within and between urban centres of different sizes and geographic locations (Osuteye et al. 2016). Such databases also exclude everyday hazards since the latter fail to meet the criteria to be recorded as disasters, despite the significant impacts they have on health and well-being, especially among the urban poor. Databases thus need to be broadened to encompass the full range of hazards that affect urban populations, as well as the many social characteristics (such as gender, age, ethnicity, ability/disability, income and immigration status) that shape vulnerability.

Clarifying event attribution

It is difficult to distinguish between single large events and multiple small events: when a city floods following heavy rainfall is this one flood event, or a multitude of small, local events? Attribution to specific events becomes even more critical in cities where the urban environment is fragmented, leading to a complex patchwork of events when compared to rural contexts. The poorer and less developed the city the more important everyday hazards are. For example, few cities in sub-Saharan Africa are exposed to hurricane, storm surge or earthquake, yet their populations are regularly affected by flooding, water and food insecurity. This is a product of critically high levels of vulnerability linked to poverty and inequality. Attribution is needed to reveal and attack the roots of risk that lie in vulnerability and the challenges of development.

Emergent risks

Climate change is intensifying existing hazards and bringing novel hazards and hazard combinations to cities, yet the ability of city and national governments to respond varies widely. Heatwaves are among the climate hazards with the largest potential impacts, yet few cities outside North America and Europe take heatwaves seriously. Perhaps part of the challenge with temperature events (cold as well as heat) is that they impact primarily on health and not physical assets. This makes losses less easy to observe and one step removed from the economic metrics of many loss inventories. Measuring mortality, morbidity and the livelihood costs of heatwaves requires some sophistication to establish baseline rates for comparable time periods in past years. Monitoring of the SFDRR can be a lever to bring together health data from across cities and nationally to allow such monitoring of loss and damage.

BOX 3

Kounkuey Design Initiative (KDI), Nairobi

The Kounkuey Design Initiative (KDI) is a non-profit design and community development organization that partners designers, community workers and researcherswith underserved communities in the US, Africa and Latin America to physically transform communities and in the process, improve the environmental, economic and social quality of life.

Source: http://www.kounkuey.org/index.html

Our contribution to the solutions

Science is responding to the SFDRR by:

Collaborating to meet data, technical and strategic challenges

While large cities can have complicated administrative structures, smaller cities often have almost no administrative capacity. In both contexts collaboration is needed to make sure research is useful, useable and used. In Nigeria, the University of Ibadan has collaborated with UNISDR, King's College London, local administration, hospitals and news media to build one of the first city-scale disaster loss databases in Africa – an initiative that shows even the challenges of aggregation, attribution and emergence can be overcome though collaboration[2].

2 A project of the Urban Africa: Risk Knowledge programme funded by DFID-ESRC, See https://www.urbanark.org/city/ibadan-nigeria

Contributing to capacity building via new partnerships

Science has long partnered with local government. More novel partnerships, such as with neighbourhood groups (Box 3), humanitarian actors and civil sector organizations, open scope for building capacity at the base. Local government continues to occupy the pivotal space between community and city or national and between state, private and civil sector actors, but strengthening the functions of local government may be served as well by enabling civil society (Dobson et al. 2015).

Focusing on science impact

A shift is being felt from science driven by the refinement of existing tools in a search for greater precision towards an improvement in the communication and utilization of science outputs. This is seen in hazard modelling in particular, but also in financial loss-sharing and vulnerability or resilience assessment mechanisms, for example, by shifting science effort from incremental improvements in probabilistic forecasting to better informed communication strategies or better understanding the social and economic constraints on taking action even when an early warning is provided.

Bringing an independent vision and voice to monitoring SFDRR

Science partnerships such as IRDR are active in supporting government-led initiatives for the refinement of the SFDRR indicators. But the SFDRR indicator system will always be compromised by the need for indicators that can be managed by all signatory states. This leaves volumes of data outside of Sendai but with the potential to push national consciousness and action to go beyond. Marshalling, interrogating and presenting such data is perhaps the most important role for international science.

References

Birkmann, J., Welle, T., Solecki, W., Lwasa, L., and Garschagen, G. (2016) Boost resilience of small and mid-sized cities, *Nature,* 537, 605–608.

Brown, D., Leck, H., Pelling, M., and Johnson, C. (2017) *Urban Africa: Risk Knowledge – A Research Agenda.* Urban ARK Policy Brief. Accessed from http://pubs.iied.org/pdfs/G04115.pdf

Dobson, S., Nyamweru, H., and Dodman, D. (2015) Local and participatory approaches to building resilience in informal settlements in Uganda. *Environment and Urbanization,* 27(2): 605–620.

IRDR China National Committee (2017) *Strategy Report on Disaster Risk Reduction in the context of China's new-type urbanization process* (draft).

Kampala Capital City Authority (2016) *Kampala Climate Change Action,* accessed from http://www.kcca.go.ug/uDocs/Kampala-Climate-Change-Action.pdf

Osuteye, E., Johnson, C., Brown D. (2016) *The data gap: An analysis of data availability on disaster losses in African cities.* Urban ARK Background Paper, accessed from https://www.urbanark.org/publications

Pelling, M. (2003) T*he Vulnerability of Cities: social resilience and natural disaster* London: Earthscan.

UNDESA (2015) *World Urbanization Prospects, 2014 Revision.* New York: United Nations.

UNISDR (2011) *Global Assessment Report on Disaster Risk Reduction 2011,* accessed from http://www.preventionweb.net/english/hyogo/gar/2011/en/home/index.html

UNISDR (2014) *Urban risk reduction and resilience,* accessed from http://www.unisdr.org/files/37966_finalwp3.pdf

Watson, V. (2009) The planned city sweeps the poor away… Urban planning and 21st century urbanisation. *Progress in Planning,* 7, 151–193.