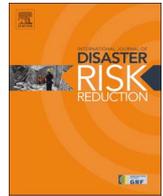


Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

# International Journal of Disaster Risk Reduction

journal homepage: [www.elsevier.com/locate/ijdrr](http://www.elsevier.com/locate/ijdrr)

## Africa's urban risk and resilience



### A B S T R A C T

The literature on disaster risk and its reduction in Africa's urban centres remains limited, despite evidence of disaster risks increasing with urban growth. This Special Issue brings together new synthetic reviews, detailed empirical case studies and practitioner and expert commentary to highlight the multiple ways in which risk and urban development are co-evolving in the region. It broadens understanding about the nature, scale and distribution of urban risks, examining relationships between everyday and disaster risks across scales. Papers in the Issue also interrogate the role of governance processes in driving risks, including strong recognition of the role of social institutions where formal governance structures are incomplete, and the underlying knowledge and power relationships that shape urban risk management. Potential learning from innovation is discussed in the light of the rise of resilience paradigms in urban development as well as the ongoing embedding of international agreements in local agendas that offer the potential to drive forward risk-sensitive urban development pathways.

The towns and cities of sub-Saharan Africa are the setting for myriad struggles over development futures. Such futures offer huge opportunities, but are also produced in the interaction with risks and losses from disaster events. Better understanding the actors involved in struggles to reduce risks, their partnerships, capacities and ambitions, as well as hazard contexts, is a central ambition for research seeking positive impact in the region's emerging cities. Indeed, new research and policy agendas concerned with risk and resilience are rising to be a core enabling framework for sustainable urban development. Risk and resilience are a prominent concern in UN HABITAT's New Urban Agenda, a 20-year international framework for sustainable urban development which builds on priorities identified in the Sustainable Development Goals (SDGs) and the Sendai Framework for Disaster Risk Reduction. The SDGs present the development community with an integrated approach to risk management that recognizes urban development as a driver as much as a solution for risk and loss, and vulnerability a threat to poverty eradication. However, it is important to consider how urban risks and resilience are being conceived in emerging theory and practice as concepts that hold multiple meanings and intentions for different actors. Emergent framings of risk and resilience offer the potential to shift debates on and responses to the need for social justice in towns and cities, as a critical dimension of equitable and inclusive risk reduction and resilience building [42].

Sub-Saharan Africa faces mounting disaster risk rooted in deep inequality and environmental deterioration, and is being transformed by a late-onset and fast-paced urbanization process. Disaster risk in the region has increasingly urbanized (Pelling and Wisner, 2008). So-called 'natural' disasters have grown in the region as a whole since the 1970s with increases in human exposure to disaster risks largely driven by population growth in cities as well as urbanization [41], interwoven with the effects of state fragility. Despite the significance of large scale disasters, the impacts of everyday hazards (such as infectious and parasitic disease linked to unsanitary conditions) and small disasters (such as localized floods and shack fires) in the region cannot be underestimated. Especially at the city scale, understanding the linkages between development process, underlying everyday risks and periodic disaster risk is vital if development is to be a force for reducing rather than generating risk [24]. This Special Issue responds by taking a broad understanding of urban risk across a spectrum encompassing everyday, small and large events [2,5]. In doing so, we emphasize the need to better understand the nature, scale and distribution of risks, not only to inform risk reduction interventions involving disaster management, but also urban planning, public health and other risk-sensitive development policies. As Osuteye, Johnson and Brown (2017) emphasise, understanding this urban risk nexus will mean integrating different data sources, such as health, hazard and loss data alongside social development indicators, to better understand the complexity of chronic issues faced by Africa's urban centres.

<https://doi.org/10.1016/j.ijdrr.2017.09.050>

Scholarly attention to urban environmental risk in the region is growing, but the sub-set of literature on urban disaster risk and its reduction in sub-Saharan Africa is still limited [2] and the lack of literature on related climate change risks was noted as a limitation on the IPCC's Urban Chapter of the Fifth Assessment Report [28]. Many African towns and cities are under-researched in relation to climatic and broader environmental change, and the literature that does exist focusses more heavily on biophysical vulnerabilities at the regional scale than social vulnerability at the urban scale [17,32] rendering the urban invisible in some analyses. Against this scientific bias the urban has risen consistently as a policy concern for international agencies, reflected in the inclusion of a dedicated SDG for making cities and human settlements inclusive, safe, resilient and sustainable [18]. While research, practice and policy have long remained embedded in the imaginary of Africa as a rural region – despite decades of urbanization and future projections of rapid urban growth – attention has begun to shift: driven in part by the changing agendas of development agencies, but most notably among the discourses of African governments themselves [27].

While inevitably diverse in historical and geographic profile regional commonalities are evident in sub-Saharan Africa's urbanization trajectories and co-evolving risk profiles. Common features relate to limited financial resources, contradictory relations between city and national administrations, inadequate services and support for citizens [14]; a common process of 'psuedo-urbanisation' where cities form in a dualised manner without the infrastructural underpinnings for inclusive and sustainable development [16]; colonial legacies, a lack of governance capacity, endemic poverty, inequality and informalisation combined with low levels of economic development and contested urban development processes [20,42].

Under the new mantras of the Sendai Framework on Disaster Risk Reduction, African ministers endorsed in 2016 a more forward-looking and holistic agenda for the reduction of disaster risk [26]. As Gore stresses in relation to climate change, African cities are not "passive bystanders to the global climate challenge" (p. 220), but are internationally engaged in climate change learning and knowledge networks [14]. Yet at city levels, and in small and medium sized towns across the continent, the little research that is available points to vast deficits in local state governance exercised across a fragmented landscape of state and non-state actors, including considerable, concentrated private investment and the growing voice of informal settlement dwellers [22,29-31]. Potential learning from innovation, however, should not be overlooked, whether it be city-led experiments in adaptation (emergent mainly in large cities in Southern Africa – see [30]; [7] or community-led responses to upgrading and risk reduction [3,8,9]. The opportunities for progressive risk management in the urban centres of the region may largely be a function of organized civil society efforts executed in collaboration with supportive city administrations and even private sector actors.

Following Simon and Leck's [32] call for a more comprehensive and comparative research programme on urban hazard in the region [32] this Special Issue considers hazard and risk in a broad frame, engaging more pointedly with the potential for more just, effective and inclusive urban development responses. The Special Issue brings together detailed empirical studies and synthetic reviews from East, West and Southern (Anglophone and Francophone) sub-Saharan Africa. Drawing together contributions from African and Western-based scholars, senior and early career researchers as well as policy actors, the Special Issue aims to fill a gap in both overview analysis and in grounded case studies of urbanization and risk for the region – but also draw out the wider implications for global research and policy. The papers are interdisciplinary, drawing from different traditions and emerging concepts across the social and political sciences. Three strategies are deployed by included papers:

First, the Special Issue broadens understanding about the possible nature, scale and distribution of risks across the spectrum [2]. In particular, the predominance of everyday over catastrophic risk in urban areas in the region allows a closer focus on the intersection between small, recurrent events and development, often neglected with the research focus on major, catastrophic events. UNISDR recognises everyday risk and loss as a greater impediment for development than catastrophic events, and that this is likely to be especially the case for low income households with few physical assets [35]. It is also the case that identifying and acting on the risks of 'small' disasters can reduce the risks and impacts from larger ones (Bull Kamaga et al. 2003), and this focus can usefully inform disaster risk reduction and climate change adaptation plans, policies and programmes.

Second, papers strengthen the scientific base for understanding the inter-connectedness between risk and development as well as how resilience can form part of integrated development planning for urban areas. These are core concerns for the IPCC ahead of its 2018 Special Report on the impacts of global warming of 1.5 degrees, given the need to relate the latest climate change agreements to the over-arching Sustainable Development Goals for poverty alleviation and human development as well as the Sendai Framework. While the link between urbanization and risk exposure is apparent and stark, the social, political, economic and cultural processes that accompany and underpin demographic shifts through urbanization also drive further processes of risk accumulation, and may be highly differentiated across urban spaces [2]; [11]. Exploring risk and resilience as interlinked with these processes opens up space to ask how addressing unmet urban development challenges can also reduce risk [23]; see also [11]; [10].

Third, the role of governance processes in driving risk is interrogated, including the potential for change and innovation. The challenge of integrating resilience into urban governance has been increasingly highlighted for the sub-Saharan African region – there is a large literature that documents the weaknesses and capacity challenges faced by many local authorities and governance systems in post-colonial African cities [1,13,15,19,33,34,38]. Research on urban disaster risk and climate change has begun to chart gaps in formal governance capacities and knowledges (Manda, 2014; [23], the relational dynamics of multi-scalar governance influencing urban areas [36] and how the endogenous structures of municipal government, and their relationships with non-governmental actors, shape responses to climate change [14]. However, whilst acknowledging the critical role that local government can play, there is also a need to recognize how social institutions and non-governmental actors work 'in the shadows' and in informal spaces; with and around incomplete formal governance mechanisms and structures; and explore the underlying knowledge and power relationships shaping risk governance and emergent innovations. In sub-Saharan Africa rapid urbanization processes have led to considerable dynamism and produced some innovative developmental and other experiments at various scales even where many blockages remain [21]. This is certainly the case in the field of resilience building and its associated areas of disaster risk reduction, climate change adaptation and public health [39], where good practice, innovation and the politics of different approaches and arrangements merit theorizing and the lessons drawing out for the context of building resilience to disaster impacts.

Given the uncertainties associated with estimating the impacts of different temperature and geophysical regimes on local-level risks, the shift in governance from risk management to resilience-building becomes even more imperative for African cities. New framings and paradigms for tackling disaster risk in a changing climate are becoming increasingly embedded in international and national arenas, and increasingly within risk management for cities. More robust discourses about the need to address underlying risk drivers, promote risk-sensitive development and reform risk governance – epitomized in the 2011 UNISDR Global Assessment Report 'Revealing Risk, Redefining Development' – have lodged to some extent in international frameworks and indicators for tracking global progress on risk reduction [25]. Risk is also more

strongly acknowledged as a constraint on urban development – and resilience as a necessary imperative – in international development frameworks such as the Sustainable Development Goals and New Urban Agenda (Ziervogel et al., 2017). A core shift in focus from risk reduction to resilience-building has been embraced by actors including the resilient cities movement itself, with such transnational city-to-city networks proving instrumental to city action on disaster risk and climate change [6]. The shift is more than rhetoric – as noted by the Rockefeller Foundation (cited in [4]: 5):

“It moves away from traditional disaster risk management, which is founded on risk assessments that relate to specific hazards. Instead, it accepts the possibility that a wide range of disruptive events – both stresses and shocks – may occur but are not necessarily predictable. Resilience focuses on enhancing the performance of a system in the face of multiple hazards, rather than preventing or mitigating the loss of assets due to specific events.”

The implication for governance – the need for multi-level participation and knowledge-sharing [12] – is challenging. This is particularly so for dynamic, highly unequal urban settings and to a large extent the potential for such forms of governance are still untested. However, in sub-Saharan Africa, the rapid growth of cities in the region also brings scope for enabling urbanization processes that can build resilience with equity.

## 1. Overview of contents

The papers in this volume respond to the core issues above, and have been brought together by the ESRC-DFID funded *Urban Africa: Risk Knowledge* (Urban ARK) research and capacity building programme ([www.urbanark.org](http://www.urbanark.org)), which aims to better understand the changing scale, nature, distribution and underlying drivers of risk for urban citizens in the region. The papers overlap and build on other major international programmes in this area, with common authorship represented from the *Peri Peri U* (USAID funded; Pharoah and Zweig) and *Coastal Cities at Risk* (START; Ajibade and McBean) programmes. This allows for a comprehensive view of the research frontier, and provides grounded empirical studies that can support global synthesis efforts, like the IPCC, so better representing the diverse contexts and trajectories of the urban risk-development nexus in sub-Saharan Africa. Collectively these papers help move beyond the integrated risk assessment frameworks utilized in related volumes of work. While this work provides vital information about risks across the dimensions of biophysical hazard, social vulnerability and exposure and capacity, it tends towards snapshot analysis and an examination of the implementation challenges for formal governance systems (See [23]; [17]). The current papers build on this by helping to reveal underlying processes and governance dynamics, in particular across formal-informal institutions.

The Special Issue is structured around two emergent themes. Papers in the first section, ‘*Urban development and the dynamics of disaster risk*’, show how disaster risk is embedded in contemporary processes of urbanisation, and the wider political, cultural, social and economic dimensions of urbanism, linked to developments across all scales of governance. Particular attention is paid to often overlooked everyday risks and extensive events [35]. Rather than viewing such events in isolation, the Special Issue focusses on the dynamic processes of risk accumulation that occur with un- or poorly-planned urban development [37,40].

The synthesis paper by Dodman, Leck, Rusca and Colenbrander examines the multi-faceted nature of Africa’s urbanisation trajectory and the implications of current pathways of urban development for the scale and nature of risk. The authors highlight how the spatial, economic, social and political work together to create new manifestations of risk, in particular everyday extensive risk, highlighting the implications of spatial expansion, demographic change and the prevalence of informal settlements and economies. The article culminates in a reflection on the urban risk governance landscape of diverse and fragmented actors – including private investors and donors as well as traditional authorities - highlighting the increasing centrality of collaboration and partnerships in resilience building and the need for risk managers to work with broader issues of land use, planning and service provision. The authors cite neighborhood-level responses to particular hazards as emerging evidence that risk reduction activities can also contribute to the shaping of state-citizen relationships more broadly, creating further knock-on effects on responses to disaster risk.

Satterthwaite’s contribution builds on core themes in Dodman et al. and critically explores the underlying demographics of sub-Saharan Africa’s urban development and the governance challenge it presents, including for risk reduction. Unmet needs for potable water, sanitation, electricity, transport and other services create multiple, compounding hazards for low-income urban populations which exacerbate risk and vulnerability to disasters and climate change. The scale of such unmet need in urban sub-Saharan Africa currently remains vast – both in large cities experiencing large increases in population numbers despite slowing growth rates, as well as in small and medium-sized urban areas where much of sub-Saharan Africa’s urban population live. We know too little about the nature and distribution of environmental and climate-related risks in these urban areas – which may differ sharply in their form and function. Drawing on available statistics and case studies about water and sanitation provision in particular, Satterthwaite emphasizes the inadequacy of provision for smaller urban centres – which contributes directly to disaster risk and reflects the lack of government capacity to respond to risks.

The complementary paper by Osuteye, Johnson and Brown examines the potential to develop new datasets on disaster losses in sub-Saharan Africa, in particular those that could shed light on everyday risks and endemic health losses. Building on the validity of the *Desinventar* methodology, the authors advocate for better collation of existing records related to health and other everyday risks and a more comprehensive collection of risk and disaster data at the urban and intra-urban scale. In the absence of such data, they urge policy-makers to use participatory approaches to verify and triangulate information, and build constituencies to support better data collection processes.

Ian Douglas takes forward analysis of the role of interlinkages across political and administrative levels, ecological and social systems and between geophysical and human processes in creating risk and resilience for urban areas affected by flooding in sub-Saharan Africa. Centred on the key notion of ‘teleconnectedness’, his analysis brings to the fore the multiple factors and levels at which different forms of flood risk are produced, and out of which the impacts are felt – both across the sectors of food, transport, energy and water, across rural and urban domains and from the river basin to the neighbourhood level. While these interdependencies are well highlighted in conceptual literatures about urban resilience [12], they are often inadequately ingrained in practice. Indeed, Douglas shows that despite many interventions being taken to mitigate flood impacts in the region, there is a need to move beyond single, often structural, measures at the local-level to develop holistic and innovative practices that bring together multiple, different actors. Research, too, needs to shift from focusing on simple procedures and disaster losses to understanding causes, and how to address them.

Shifting from regional panorama to in-depth, sited analysis, papers based on research in cities in Ghana and South Africa further develop our

understanding of the nature of ‘everyday’ urban risk. The paper from Ghana shows the inter-connection between so-called everyday or chronic, recurrent risks and disaster risk for low-income urban inhabitants, the two-way nature of the relationship and its cumulative effects on risk production (Songsore, 2017). In his commentary on the 2014 cholera outbreak and 2015 floods in Accra, Ghana, Songsore reflects on the unchanging nature of their linked, underlying drivers and their uneven spatial and social distribution (ibid.). Pharoah and Zweig echo earlier papers in their characterisation of urban risks, not as intermittent, stand-alone, localised events, but as:

“constantly and rapidly evolving, characterised by increasing complexity and creeping accumulation of risk over time, often directly or indirectly related to broader external processes” (p.x, 2017).

Through case studies from the Western Cape, South Africa, the authors show how everyday and disaster risks experienced locally link to macro-scale processes which drive economic and institutional re-structuring. Risk is both ‘de-localised’ and uniquely shaped by the local context. It is highly idiosyncratic in nature, with urban areas experiencing the same hazard nevertheless differentiated by differing risk accumulation processes and household and community perceptions and responses (Pharoah and Zweig, 2017).

When urban risk is understood in these ways, the challenge for policy-makers and practitioners is to engage in nuanced and grounded practice and address sets of multiple, overlapping risks at scale (Pharoah and Zweig, 2017, and Songsore, 2017).

The importance of understanding everyday risks, and the plurality of underlying experiences and perceptions, is further iterated in Frick-Trzebitzky, Baghel and Bruns’ paper from Accra, Ghana, which closes the first section. The paper tackles the questions of governance deficits raised in earlier papers from a bottom-up perspective, asking what biophysical, social and institutional processes are driving risk creation and mitigation across the different ‘riskscapes’ in rapidly urbanising areas where formal planning has little purchase on urban development. The spatial, temporal and socially differentiated experiences of flood risk and vulnerability are linked to the actors and institutional practices connected to infrastructure development and use, land use management and flood risk reduction. The resulting analysis shows how customary rules, government regulations and market mechanisms ‘piece together’ through the workings of ‘twilight institutions’, influencing vulnerabilities through a process of bricolage between the formal and the informal, in which institutions are in continuous flux. The paper adds momentum to the call for multiple actors – local and distant – to be engaged in risk reduction, and for risk reduction actors to engage with the broader policy regimes which shape risk on the ground, as well as exposing the limitations of policies directed only at formal institutions.

The papers in the first section all re-iterate the existence of a serious ‘gap’ in the formal governance of urban risk, which is both partial in spatial reach and in its ability to address the underlying nature and drivers of risks faced by the most vulnerable citizens, and which by omission or design then creates new forms of disaster risk. However, the papers also point to possible building blocks for the governance of urban resilience going forward, particularly on the basis of local-scale and informal – or partially informal – initiatives. The second section of the Special Issue ‘*New experiments in risk reduction: opportunities and challenges*’ addresses this more squarely.

The section opens with a study from Malawi illustrating how the nature of WASH interventions and governance in a small urban context impacts on the interlinkage with disaster risks – interlinkages which receive little attention in governance. Analysis of water, sanitation and hygiene (WASH) governance in Karonga Town, Malawi, by Wanda, Manda, Msiska, Kamlomo, Kushe, Mphande and Kaunda shows how the financial and institutional constraints on WASH provision – in part caused by institutional conflict, disconnect and lack of clarity as incomplete devolution processes couple with the lack of advocacy for WASH services, lack of private sector engagement and development agency and NGO bypassing of council structures – drive the everyday risks from disease triggered by rainfall events, which in turn may degrade WASH services. Sectoral policies and practices focused on water supply neglect a holistic view of the drivers of risk from poor WASH infrastructures overall, while the lack of dedicated legal and governance frameworks for a small town hampers action.

Shifting from a sectoral to an actor-focused lens, a practitioner commentary from Dobson for Slum Dweller’s International examines the potential for community-driven slum upgrading and partnership between local authorities and organized communities to build multiple facets of resilience including improved housing, energy and water and sanitation provision. As Dobson discusses, such arrangements can build on the comparative advantages of different local actors, and generate substantial social and political co-benefits. However, as the example of the costs of eviction in Nigeria shows, such approaches are not a given, and often depend on long-standing struggles and long-term support. The piece also highlights how communities themselves can also play a key role in tackling a major challenge identified in the opening papers: lack of data.

Three final research papers from Lagos, Dakar and Goma highlight the underlying politics of urban resilience-building and the power and knowledge relationships that will continue to shape the emergence of urban risk management and adaptation strategies in the region. Through a UPE (Urban Political Ecology) lens, Ajibade shows how the Eko Atlantic City construction project in Lagos, Nigeria – the largest eco-engineering project of its kind in West Africa – has been shaped and legitimized by powerful economic interests in the name of resilience and adaptation, but how the promise of short-term storm mitigation masks the long-term implications for the wider city landscape and future and marginalized urban populations. A critical discourse analysis of the narratives, visions and claims of the different actors involved, and the discursive strategies they use, reveals both the potential for maladaptation, as well as opening up space to imagine other, more transformative responses to flood risk in the city.

Reflecting on flood risk management approaches in the urban Sahel, Leclercq contrasts the approaches of two networks of urban actors in Dakar, Senegal, and the struggle for solutions in the city’s suburbs. Through actor-network analysis of their respective narratives about the causes of flooding and the nature of an effective response he reveals how risk management options are configured through the politics of the city, and how attempts by international donors to bypass this politics merely undermine the sustainability and effectiveness of mitigation projects.

Finally, in a commentary piece focused on the context of conflict and failed governance, Wisner challenges the ability of development and humanitarian actors to ‘build back better’ from urban crises, or the notion at the heart of resilience thinking as well as new international frameworks for risk management. Reflecting on the recovery process after the 2002 volcanic eruption in Goma, Democratic Republic of Congo, he reveals how the privatization of Goma’s urban development – driven in part by the activities of international humanitarian agencies themselves – inter-linked with the broader socio-political environment drives ongoing vulnerability to multiple, contiguous threats within a urban context marked by ambiguous boundaries and human mobility. Echoing one of the central messages of this Issue, he argues that piecemeal and technical solutions focused on a single event can only go so far – reducing risk ‘for the next time’ means understanding such processes of risk accumulation, and confronting the

interests that maintain the status quo.

A closing substantive commentary piece by the guest editors Fraser, Leck, Parnell, Pelling, Brown and Lwasa revisits the Special Issue's rationale – to bring together frontier overview and grounded case study research from sub-Saharan Africa to highlight systemic failings in the risk-development nexus, its multiple trajectories and possible spaces for solutions. It asks how we might develop new understandings of urban risk accumulation to capture the underlying drivers across spaces, sites and networks that are rural and urban, formal and informal, biophysical and institutional and local, national and regional. It reflects on the nature of the urban innovations highlighted in the issue. Finally, it discusses the ambitious agenda that this analysis implies for resilience-building work, one that moves beyond a narrow focus on hazard or disaster event and the immediate actors involved to one that grapples with the deeper relationship between risk and urban development and the broader sets of actors implicated. This is a challenge and opportunity not only for sub-Saharan Africa but for the wider international policy processes in which work on urban development and disaster risk reduction is enacted. The SDGs, we argue, provide a potential global narrative for integration that can be used to support the claims and demands of those at risk and the management of risk-sensitive urban development in the region.

## Acknowledgements

This paper and Special Issue was supported by the Urban Africa: Risk Knowledge (Urban ARK) programme, funded by the UK Economic and Social Research Council (ESRC) and Department for International Development Humanitarian Innovation and Evidence Programme under Grant No. ES/L008777/1. This Special Issue is an academic output of the Urban ARK International Science Conference held in Lilongwe, Malawi in January 2016.

## References

- [1] ACC, *Urbanization Imperatives for Africa: Transcending Policy Inertia*, African Centre for Cities (ACC), Cape Town, 2010.
- [2] I. Adelekan, C. Johnson, M. Manda, D. Matyas, B.U. Mberu, S. Parnell, M. Pelling, D. Satterthwaite, J. Vivekananda, *Disaster risk and its reduction: an agenda for urban Africa*, *Int. Dev. Plan. Rev.* 37 (1) (2015) 33–43.
- [3] O.B. Adegun, *State-led versus community-initiated: stormwater drainage and informal settlement intervention in Johannesburg, South Africa*, *Environ. Urban.* 27 (2) (2015) 407–420.
- [4] Arup - The Rockefeller Foundation (2016) "City Resilience Index: Understanding and Measuring Urban Resilience." Arup-The Rockefeller Foundation. <[http://www.arup.com/city\\_resilience\\_index](http://www.arup.com/city_resilience_index)>.
- [5] L. Bull-Kamanga, K. Diagne, A. Lavell, E. Leon, F. Lerise, H. MacGregor, A. Maskrey, M. Meshack, M. Pelling, H. Reid, D. Satterthwaite, J. Songsore, K. Westgate, A. Yitambe, *From everyday hazards to disasters: The accumulation of risk in urban areas*, *Environ. Urban.* 15 (1) (2003) 193–204.
- [6] J. Carmin, A. Anguelovski, D. Roberts, *Urban climate adaptation in the global south: planning in an emerging policy domain*, *J. Plan. Educ. Res.* 32 (1) (2012) 18–32.
- [7] V. Castan Broto, H. Bulkeley, *A survey of urban climate change experiments in 100 cities*, *Glob. Environ. Chang.* 23 (2013) 92–102.
- [8] V. Castan Broto, D.A. Macucule, E. Boyd, J. Ensor, C. Allen, *Building collaborative partnerships for climate change action in Maputo, Mozambique*, *Environ. Plan. A* 47 (2015) 571–587.
- [9] S. Dobson, H. Nyamweru, D. Dodman, *Local and participatory approaches to building resilience in informal settlements in Uganda*, *Environ. Urban.* 27 (2) (2015).
- [10] D. Dodman, D. Mitlin, *Challenges for community based adaptation: Discovering potential for transformation*, *J. Int. Dev.* 25 (5) (2013) 640–659.
- [11] Dodman, D., Leck, H., Colenbrander, S., Rusca, M (2017) *African Urbanisation and Urbanism: Implications for risk accumulation and reduction*, Urban Africa: Risk Knowledge (Urban ARK) Working Paper. Available at <[www.urbanark.org](http://www.urbanark.org)>.
- [12] A. Fraser, M. Pelling, W. Solecki, *Understanding Risk in the Context of Urban Development: Definitions, Concepts and Pathways*. In *Cities on a Finite Planet: Towards Transformative Responses to Climate Change*, Taylor and Francis Inc, 2016, pp. 17–40.
- [13] M. Gandy, *Planning, anti-planning and the infrastructure crises facing Metropolitan Lagos*, *Urban Stud.* 43 (2) (2006) 371–396.
- [14] C. Gore, *Climate change adaptation and african cities: understanding the impact of government and governance on future action*, in: C. Johnson, N. Toly, H. Schroeder (Eds.), *The Urban Climate Challenge: Rethinking the Role of Cities in the Global Climate Regime*, Routledge, London, 2015.
- [15] P. Harrison, *On the edge of reason: planning and urban futures in Africa*, *Urban Stud.* 43 (2) (2006) 319–335.
- [16] S. Lwasa, *Managing city growth and development in the context of environmental changes within Sub-Saharan Africa*, *UGEC Viewpoints* (2) (2009).
- [17] S. Macchi, M. Tiepolo (Eds.), *Climate Change Vulnerability in Southern African Cities: Building Knowledge for Adaptation*, Springer, 2014.
- [18] T. McPhearson, S. Parnell, D. Simon, O. Gaffney, T. Elmquist, X. Bai, D. Roberts, A. Revi, *Scientists must have a say in the future of cities*, *Nature* (2016), <http://dx.doi.org/10.1038/538165a>.
- [19] G. Myers, *African Cities: Alternative Visions of Urban Theory and Practice*, Zed Books, London, 2011.
- [20] G. Myers, *Urban Environments in Africa: A Critical Analysis of Environmental Politics*, Policy Press, Bristol, 2016.
- [21] S. Parnell, R. Walawege, *Sub-Saharan African urbanisation and global environmental change*, *Global Environ. Chang.* 21 (Supplement 1) (2011) S12–S20 Ps.
- [22] L. Pasquini, G. Ziervogel, R.M. Cowling, C. Shearing, *What enables local governments to mainstream climate change adaptation? Lessons learned from two municipal case studies in the Western Cape, South Africa*, *Clim. Dev.* 1 (2015) 60–70.
- [23] S. Pauleit, G. Jorgensen, S. Kabisch, P. Gasparini, S. Fohlmeister, I. Simonis, K. Yeshitela, A. Coly, S. Lindley, W.J. Kombe (Eds.), *Urban Vulnerability and Climate Change in Africa*, Springer, Berlin, 2014.
- [24] M. Pelling, B. Wisner (Eds.), *Disaster Risk Reduction: Cases from Urban Africa*, Earthscan, London, 2009, p. 224.
- [25] L. Pearson, M. Pelling, *The UN Sendai framework for disaster risk reduction 2015-2030: Negotiation process and prospects for science and practice*, *J. Extreme Events* 2 (2015) 1.
- [26] Peters K and Lovell E (2016) *Governments are moving from managing disasters to managing risks*. Thomson Reuters News Foundation, Tuesday 13 December, <<http://news.trust.org/item/20161213092133-orqay>>.
- [27] Pieterse, E (2016) 'An alternative New Urban Agenda for Africa' in *Policy in Focus* 13(3), December 2016, United Nations Development Programme.
- [28] A. Revi, D.E. Satterthwaite, F. Aragón-Durand, J. Corfee-Morlot, R.B.R. Kiunsi, M. Pelling, D.C. Roberts, W. Solecki, *Urban areas*, in: C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, L.L. White (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2014, pp. 535–612.
- [29] L. Ricci, B. Sanou, H. Baguian, *Climate risks in West Africa: Bobo-Dioulasso local actors' participatory risks management framework*, *Curr. Opin. Environ. Sustain.* 13 (2015) 42–48.
- [30] Simon, D (2010) *The Challenges of Global Environmental Change for Urban Africa*. UNU-WIDER Working Paper No. 2010/51.
- [31] J. Silver, C. McEwan, L. Petrella, H. Baguian, *Climate change, urban vulnerability and development in Saint-Louis and Bobo-Dioulasso: learning from across two West African cities*, *Local Environ.* 18 (6) (2013) 663–677.
- [32] D. Simon, H. Leck, *Understanding climate adaptation and transformation challenges in African cities*, *Curr. Opin. Environ. Sustain.* 13 (2015) 109–116.
- [33] UN-Habitat, *The State of African Cities 2010: Governance, Inequality and Urban Land Markets*, United Nations Human Settlements Programme, Nairobi, 2010.
- [34] UN-Habitat, *Global Report on Human Settlements 2009: Planning Sustainable Cities*. United Nations Human Settlements Programme, Earthscan, London, 2009.
- [35] UN-ISDR, *Global Assessment Report on Disaster Risk Reduction*, ISDR, Geneva, 2013.
- [36] T. Vedeld, A. Coly, N. Ndour, S. Hellevik, *Climate adaptation at what scale? Multi-level governance, resilience and coproduction in St Louis, Senegal*, *Nat. Hazards* 82 (Suppl 2) (2016) 173, <http://dx.doi.org/10.1007/s11069-015-1875-7>.
- [37] C. Wamsler, *Cities, Disaster Risk and Adaptation*, Routledge, London, 2014.
- [38] V. Watson, *The planned city sweeps the poor away...: Urban planning and 21st century urbanisation*, *Prog. Plan.* 72 (2009) 151–193.
- [39] B. Wisner, M. Pelling, A. Mascarenhas, A. Holloway, B. Ndong, D. Simon, P. Faye, J. Ribot, *Small cities in Africa: the challenge and opportunity of climate change*, in: S. Pauleit, G. Jorgensen, S. Kabisch, P. Gasparini, S. Fohlmeister, I. Simonis, K. Yeshitela, A. Coly, S. Lindley, W.J. Kombe (Eds.), *Urban Vulnerability and Climate Change in Africa*, Springer, Berlin, 2014.

- [40] World Bank, *Climate Change, Disaster Risk, and the Urban Poor Cities Building Resilience for a Changing World*, World Bank, Washington DC, 2011.
- [41] World Bank, *Report on the Status of Disaster Risk Reduction in Sub-Saharan Africa*, World Bank, Washington DC, 2010.
- [42] G. Ziervogel, M. Pelling, A. Cartwright, E. Chu, T. Deshpande, L. Harris, K. Hyams, J. Kaunda, B. Klaus, K. Michael, L. Pasquini, R. Pharoah, L. Rodina, D. Scott, P. Zweig, Inserting rights and justice into urban resilience: a focus on everyday risk, *Environ. Urban.* 29 (2017) 1.

Arabella Fraser  
*Overseas Development Institute*

Hayley Leck  
*Kings College London*

Sue Parnell  
*University of Cape Town*

Mark Pelling  
*Kings College London*