African Urbanisation and Urbanism: Implications for risk accumulation and reduction

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A B S T R A C T

There is an increasing recognition of the need to understand and address risks of various kinds in African cities. However, there have been very few explicit examinations of the way in which the specific characteristics of African urbanisation and urbanism drive risk, or the way in which responses to risk should take these characteristics into account. This paper presents a critical review of the key features of African urban experiences, and analyses the implications for the creation and reduction of diverse risks, from the everyday to the extensive. It argues that the physical forms, social structures, economic pathways, and governance systems of cities on the continent shape their risk profiles. Of particular importance are the nature of spatial expansion, the demographic profiles of cities, and the prevalence of informal economies and settlements; while the reform of governance systems will be critical to enable risk reduction. The paper concludes that urban development actors need to consider the consequences of their actions for risk, while risk reduction practitioners will need to engage with all elements of urban development, including informality, urban poverty, infrastructure and service provision, land management, and local governance capacity.

1. Introduction

In an increasingly urbanized world, cities and their inhabitants are facing significant human and economic losses from disasters. Globally, disaster risk continues to rise as more vulnerable populations and assets are exposed to climate extremes. Cities in sub-Saharan Africa are predicted to experience some of the most severe impacts, not least due to the low levels of adaptive capacity among urban populations. There are considerable variations in severity and distribution within and among urban areas: floods and mudslides in small towns in East Africa are forcing many urban residents to leave their homes, while the growth of cities like Benin City, Port Harcourt and Alexandria in mega-deltas are increasing the number of people exposed to coastal hazards, such as storm surges and sea level rise [32,58].

Urban risks can be understood as occurring across a spectrum, encompassing everyday, small, and large events [3]. This framing encapsulates both cumulative impacts of what are termed 'extensive risks' (including everyday hazards such as infectious disease and road traffic injuries, and small disasters such as localised floods) and 'intensive risks' (larger, less frequent disaster events such as tropical storms and earthquakes) [20]. Yet, despite a growing body of literature on specific

risks, particularly flooding in African cities (e.g. [11,29,33]), existing literature and data sets do not capture adequately the way that current patterns of urban development are shaping the types and levels of risk in sub-Saharan urban areas [3,67,85]. There is thus an urgent need for more nuanced understandings of urban risk in this region, particularly how the nature and scale of these risks are shifting in the context of persistent poverty, urban growth and climate change [63].

This paper presents a critical review of African urbanism and urban change, and how these influence exposure to hazards of various types, and contribute to the vulnerability of individuals, households and communities. There is a growing body of literature on "the shift in population from rural to urban settlements" [53], and some work on natural population increase in urban areas and the spatial expansion of urban land cover. Yet there is little research into the myriad political, governance, economic, social, and cultural changes taking place in African towns and cities, and still less consideration of the implications for the generation, accumulation and reduction of risk. This paper examines these multiple dimensions of urban centres in Africa, going beyond "urbanisation" to look at the ways that Africa's "urban revolution" is shaping exposure and vulnerability to hazards [60]. It is well recognised that African urban contexts are highly varied with

different countries/sub-regions having very different urbanisation levels and urbanisation rates – while the arguments presented here are relevant across the continent, the paper primarily uses data and cases from sub-Saharan Africa.

The focus on African cities is not intended to underplay their profound diversity across all variables: indeed, "if there is something inherently true to 'the African city', it is that it resists characterization and simplification in the manner demanded by Western-based rationalities" ([22]: 260). Yet Africa's urban transformation is characterised by some key common features and particularities. The history and governance of the region are markedly different from other regions of the world [26,38,42], and African cities are further distinguished by the scale and pace of the demographic, social, economic and political transitions they are experiencing [61]. The movement of cities through such transitions is seldom smooth; rather, the rapid rate of urban change is likely to increase the production and reproduction of risks [3,63,74]. Yet the extensive urban growth and development anticipated in sub-Saharan Africa also offer considerable opportunity to address vulnerability and disaster risk before or as it emerges. It is therefore important to focus on the opportunities and potential for resilience building in emerging urban centres: conceptualising urban physical environments "merely as sites of risk misses seeing cities as wellsprings of environmental opportunities" ([57]: 90).

The following sections of the paper engage with different elements of African cities – their form, their societies, their economies, and their governance – and explore the ways in which these contribute to the production and management of risk. This analysis has relevance to a wide range of current global policy processes: understanding and addressing the multiple dimensions of risk in African cities is crucial to meeting the goals of the Paris Agreement of the UNFCCC and achieving disaster risk reduction as outlined in the Sendai Framework; at the same time, the Sustainable Development Goals and the emerging New Urban Agenda need to shape urban development in ways that reduce rather than accentuate risk.

1.1. African urban forms, dynamics and risk

1.1.1. African urbanism is characterised by small- and medium-sized cities

The majority of urban Africans have historically lived in cities and towns of fewer than 0.5 million inhabitants [75]. Although population data for small urban areas is not reliable, Fig. 1 shows that over 48% of urban Africans lived in cities of less than 1 million people in 1990, compared to 33% of urban Latin Americans and 38% of urban Asians. However, these small- and medium-sized cities are experiencing rapid growth, which – in percentage terms – may be more significant than that experienced in larger urban centres. This makes it difficult to meet demand for risk-reducing infrastructure and services, particularly considering historical underinvestment.

Small- and medium-sized urban areas often have disproportionately smaller economies than larger cities. This is because larger cities can achieve greater scale economies, where population density reduces the per capita cost of almost all infrastructure and services are reduced, and agglomeration economies, whereby proximity of labour, capital and ideas create fertile markets and opportunities for knowledge spillovers and specialisation [79]. There are exceptions to this trend, notably where a smaller urban area is a political hub. However, the prevalence of small urban areas in an African context contributes to lower urban productivity and therefore lower per capita incomes. Similarly, local authorities in smaller urban areas are likely to have less well-developed technical, institutional and financial capacities – including capacities to manage risk – than those in larger urban areas, as they have a smaller population to draw from and fewer resources to attract talent (see, for instance, [50]).

1.1.2. African cities are undergoing spatial expansion

Sub-Saharan Africa is expected to experience the highest rate of

urban population growth globally in the coming decades [8,101]. This population growth is occurring in an expansive rather than compact form [76], resulting in falling urban population densities and a higher rate of land use change than population growth rates alone might imply. In Accra, for instance, urban land cover increased more than twice as fast as the urban population between 1985 and 2000. Overall, it is predicted that between 2000 and 2050 the area in urban use in sub-Saharan Africa is projected to increase twelvefold [8]. This is a consequence of inadequate planning, rapid population growth and lack of financial or technical capacity to deliver large-scale infrastructure projects that might support liveable density [77].

In all contexts, urban sprawl comes with significant costs. For those who cannot afford cars or even formal public transport, the need to live within cycling or walking distance of employment hubs may mean that people find or build homes in hazardous areas within and around the city, such as floodplains, mangrove swamps and unstable hillsides, where formal development has been prohibited [31]. Much urban spatial expansion is accordingly taking place in low-elevation coastal zones and mega-deltas. Residents of these areas have higher levels of exposure to environmental risks such as storm surges and sea level rise, which are likely to be exacerbated by climate change [58,76]. As just one example, Vermeiren et al. [91] project that, without policy interventions, the majority of Kampala's population will live in flood-prone areas by 2030 and suffer from epidemic diseases associated with poor sanitary conditions.

Not only are informal settlements more likely to be in hazardous parts of the city, but residents are less likely to have basic services and infrastructure that can reduce risk, such as piped drinking water or drains. The residents are also likely to lack secure tenure, which reduces their incentive to upgrading housing and investing in amenities. Finally, the residents of such areas are more likely to be recent migrants, have low incomes or have otherwise reduced levels of adaptive capacity [62]. These characteristics are both caused by and contribute to exclusion from decision-making processes, which limits residents' ability to advocate effectively for risk reduction.

By significantly altering the natural landscape, the spatial expansion of African cities is causing myriad ecological impacts, including the alteration of hydrological cycles, habitat loss and increased pressure on forests and land. This environmental degradation generates new hazards such as landslides and flash flooding [10,64,76]. In Lagos, for instance, 70 per cent of the population lives in slums vulnerable to environmental hazards, including regular flood events [4]. Together with risks *for* the city, rapid urban land change also produces risks *from* the city to surrounding populations. For example, land use changes have caused major losses of farmland at the border of the peri-urban fringes, increasing economic pressure on small-scale farmers facing land expropriations (for low monetary compensations) [43].

1.1.3. African cities remain closely connected to their rural hinterlands

Rural and urban areas have often been treated as separate and unrelated by both national governments and by international development actors. Yet this ignores the importance of various types of linkages between rural and urban areas [80], and the ways in which this shapes risk. First, the spatial distinction between rural and urban is often far from clear-cut, as a strong body of work on peri-urban areas has demonstrated [54]. These peri-urban areas demonstrate characteristics both of cities and of rural areas, and act as important sources of food for urban residents, as well as being locations in which many people who work in towns and cities live. Second, individuals move to and from urban centres, and frequently retain ongoing connections with their home villages. This includes both rural-urban migration [83], and other more complex and circular processes [66]. Third, rural and urban economies are ever-more-closely intertwined, as rural residents increasingly become net purchasers of food (rather than net producers) [81]. Finally, food production, storage, distribution, and consumption – including food security for low-income urban residents – relies strongly
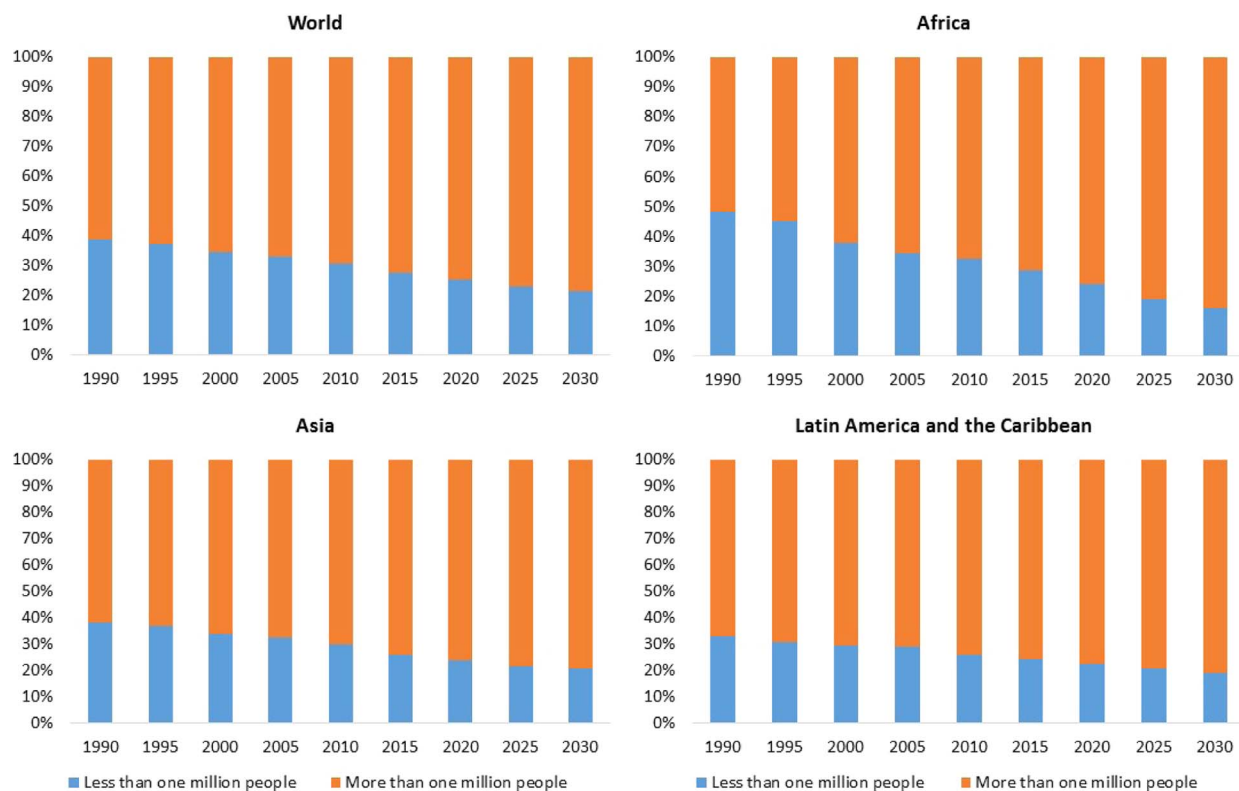
Fig. 1. Proportion of the population living in urban areas with less and more than one million inhabitants globally, in Africa, Asia and Latin America and the Caribbean (data from UN-DESA [87]). Although a higher proportion of African urban residents live in smaller urban areas in 1990 than in other regions, a larger proportion live in cities of more than one million by 2030 – signifying rapid and concentrated urban population growth.[1]

on networks that encompass both the rural and the urban [27,81].

Despite the interdependencies between rural and urban spaces being firmly established in sub-Saharan African contexts, risk management policies and interventions have often focused narrowly on either rural or urban areas [48]. This separatist approach fails to resolve political, institutional and geographical fragmentation: a more co-ordinated and programmatic approach is required to reduce urban risks generated in the periphery or wider hinterland. For example, the level of water consumption and nature of infrastructure investment in Kampala and Juba will have ramifications through the Nile catchment to Khartoum and Cairo. Several South African metropolitan municipalities such as Cape Town and eThekwini (which includes the city of Durban) are pioneering more integrated approaches to climate change adaptation and disaster risk reduction through collaboration with other municipalities [70]. Such collaboration is particularly important in sub-Saharan Africa, where large and well-capacitated cities with ambitious adaptation and DRR plans are surrounded by smaller and often urban, peri-urban and rural municipalities that often lack the financial resources or the capacity to do the same [70]. This situation applies universally but a consideration more specific to the African context is the fact that peri-urban areas often fall under communal tenure arrangements and traditional authorities.

1.1.4. African urban infrastructure is increasingly inadequate for the urban population

The uneven condition of infrastructure and services in urban Africa dates back to colonial times. Although many post-colonial governments promised universal access to public water supplies and sanitation systems [15], this egalitarian promise has remained largely unfulfilled,

with significant implications for the risks faced by urban residents. Despite initiatives such as the International Drinking Water Decade and the Millennium Development Goals, governments have proven unable or unwilling to meet the demand of the growing urban population. Indeed, the proportion of the urban population with water piped to premises and/or access to improved sanitation decreased in Eritrea, Malawi, Namibia, Nigeria, Rwanda, Sierra Leone, Zambia and Zimbabwe between 1990 and 2015 [75]. Low-income groups suffer disproportionally from deficits in infrastructures and services. Disparities in access to sanitation are particularly striking: while high-income residents are served by septic tanks or networked sewerage systems, pit latrines are the most common sanitation facilities in low-income areas [46]. Those who cannot even afford pit latrines resort to open defecation or 'flying toilets' [95].[2]

Inadequate access to safe drinking water and improved sanitation produces extensive everyday hazards for the under-served or un-served. Diarrhoeal diseases are the fourth most significant cause of death in sub-Saharan Africa [45], and are mostly transmitted via drinking water, contaminated by faecal matter [9]. The highest risks are borne by people accessing water through unsafe and untreated water sources, such as shallow wells. Contaminants in these water sources can often be attributed to open defecation or the poor maintenance of pit latrines, which are very rarely emptied or are emptied in an unsafe manner [84]. To illustrate the scale of the service gap, in Dar es Salaam, over 75% of the population living in informal settlements depend on informal and unsafe pit emptying services, where the risks of exposure to faecal sludge and contamination of drinking water sources are further increased by flooding or heavy rains [46].

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[1] Population data are for urban areas with 300,000 or more residents in 2015. Fig. 1 therefore does not include urban areas that are currently smaller than this, many of which may increase above this size over the next fifteen years.

[2] A 'flying toilet' refers to a plastic/polythene bag used to collect faeces where sanitation facilities are inadequate, absent or unsafe. The flying toilets are often thrown in drainage canal or in the environment, increasing risks of exposure to faecal contamination and water pollution.
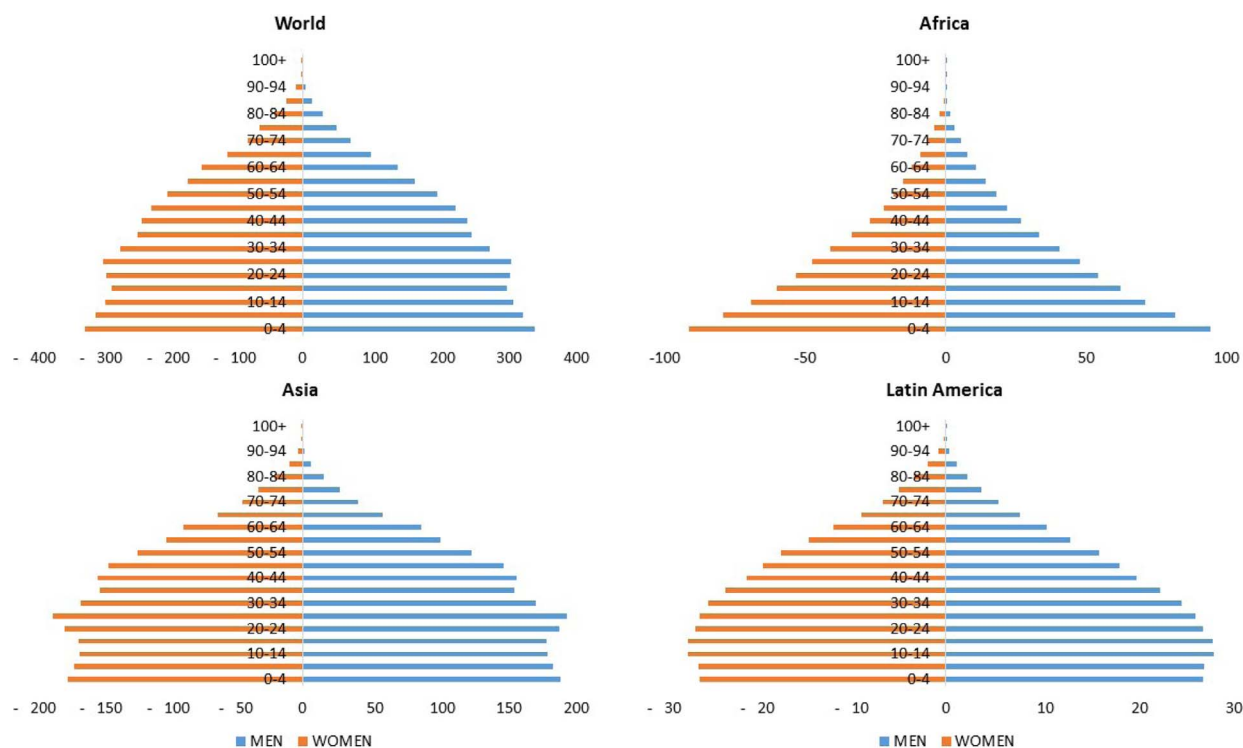
Fig. 2. The number of men and women (millions) in each five year age group in Africa, Asia, Latin America and the Caribbean and globally (data from UN-DESA [87]). Although not referring solely to urban populations, this pattern reveals the pronounced youth bulge in Africa relative to other regions.

Faecal contamination does not exclusively occur in informal water supply services. Recent studies have demonstrated that microbiological contamination occurs also in centralised water supply networks [72,73]. Further, in many cities, formal water supplies to low-income areas are characterised by high degrees of discontinuity, which forces urban dwellers to revert to unsafe water sources [44]. Risks of diarrhoeal diseases may therefore also extend to the 'served' urban population. Recognising the importance of safe drinking water to reduce health risk, the World Health Organisation (WHO) has developed and supported the implementation of Water Safety Plans, aimed at assessing and managing risks from the catchment to the consumer [14]. More recently, this approach has been extended to risks reduction along the sanitation chain with Sanitation Safety Plans [94].

1.2. African urban societies and risk

1.2.1. African cities are young

African cities have a distinctive age profile, with a predominance of young people. Although disaggregated figures for urban areas are hard to come by, children under age 15 accounted for 41 per cent of the African population in 2015, and young persons aged 15–24 accounted for a further 19 per cent. For comparative purposes, only 26 per cent of the population in Latin America is under 15, and only 24 per cent of the population in Asia UN-DESA [87] (Fig. 2). This age profile has important implications for the full spectrum of risk and resilience. Children and young people are physiologically and psychologically vulnerable to a range of shocks and stresses, with girls and boys who live and work on the streets or in low-income informal settlements being particularly susceptible to harm [13,19].

The financial costs of providing this large young population with adequate education and healthcare are also significant. Yet there is the potential for African economies and societies to enjoy a 'demographic dividend', as this youth bulge progresses into the economically productive age bracket. This youthful population also presents a potential base for political and social transition towards more democratic processes and modern economic activities.

The extent to which these opportunities will be realised in Africa is uncertain. In some cases, the youth bulge has led to a crisis of youth unemployment and underemployment. Scholars have suggested that this creates a possibility of youths "becoming impoverished forces of radicalization and conflict" (SOAC, 2014: 19). On the other hand, Sommers [78] questions the connection between the youth bulge, urbanisation and instability, highlighting that nearly all recent civil wars in Africa originated in rural areas. Certainly, appropriate economic and social policies will be a major determining factor in determining whether sub-Saharan Africa's demographic dividend will become a keystone of Africa's urban development trajectory or a major socio-political risk (SOAC, 2014).

1.2.2. African urbanism and urbanisation are driving changes in gender dynamics

Women's experiences in urban areas are highly varied and context specific, shaped by factors such as location, education levels, household profiles and wealth [96]. Typically, however, gender norms and discrimination mean that women in African cities are likely to be more vulnerable to environmental hazards than men, and face additional socio-economic challenges [23]. Yet there are still very few gender-sensitive city-scale climate and disaster management policies, let alone measures in place that account for unequal power relations, societal roles and labour divisions [97].

Gender norms around family care, household tasks and other responsibilities can mean that a woman's working day can be double that of a man [25]. In many sub-Saharan contexts, the majority of urban households remain dependent on biomass for fuels [88,89], while many also have no on-site water access. In peri-urban and smaller urban areas, cultural norms mean that the burden of collecting such resources falls on women and girls – and the sprawling pattern of urban development can make this task much more time-consuming and arduous.

Although men are more likely to be killed, women are twice as likely to experience violence [86,23]. Women's access to health care is often deprioritised relative to that of male family members, and they face further discrimination within health care systems (again, mediated

by factors such as income, religion and ethnicity) [41,49]. Notably, in twelve sub-Saharan African countries, low-income women in urban areas are more likely than low-income women in rural areas to have unmet need for family planning. These women mostly live in informal settlements, and are excluded from a wide range of public services [34]. Women in urban Africa may therefore have more exposure to particular types of risk (for example, natural resource scarcity and sexual abuse) and lower adaptive capacity than men or rural women.

While recognising these barriers and inequalities, urban environments can offer new and empowering opportunities for women. Women in African cities and towns are more likely to be able to secure property than their counterparts in rural areas, both because of their greater socio-economic freedoms and because property can be acquired through the market rather than through inheritance, where it is customarily passed to male relatives [23]. The emergence and evolution of urban cultures also create scope for the reconsideration of traditional practices and values [60,82]. Although living in urban areas can create new risks and pressures for women, particularly where these are compounded through poverty and informality, African urbanisms may offer opportunities to shift problematic power relations and reduce gendered risks.

1.2.3. African cities are often, but not always, violent

Sub-Saharan Africa has recently seen an "urbanisation of violence" [90,98]. Unlike rural violence in Africa, which predominately involves rebel and insurgent groups, urban violence is characterised by political militias, communal violence and riots by civil society [68]. It peaks during times of political unrest in countries which face political instability: Raleigh [68] particularly identifies elections as a time of risk, offering the examples of Côte d' Ivoire (2010–2011), Kenya (2002, 2007, 2008), Nigeria (2011) and Zimbabwe (2008). In many parts of urban Africa, the uncertainty, informality or even outright brutality of policing systems create significant additional risks for vulnerable and marginalised groups.

Political violence in many urban areas can be attributed to changing institutions and practices across the continent – in particular, a growing tendency by central governments to privilege rural voters [68] or to handicap municipal authorities controlled by opposition parties [69]. Xenophobia and anti-migrant sentiments have further fuelled violence in some cities, notably against Nigerian and Zimbabwean migrants in South Africa. Yet a focus on large-scale or political violence can distract from endemic interpersonal violence, such as murders, assaults and gang violence. Whether violence is political or personal, it affects political legitimacy, social cohesion and economic productivity, threatening human development, security and resilience in African cities [35].

In some cases, interventions in urban planning and governance have significantly improved the safety of African cities. The provision of street lighting and improved transport systems, for example, can reduce the opportunity for and incidence of violence [36], as demonstrated in Kigali. In other cases, particularly in the absence of accountable formal policing or effective urban planning, many urban households rely on community provision or private security to reduce the risk of violence. While there is little empirical evidence examining the link between violence and disaster risk, violence may act as a factor limiting the locations in which low income households choose to live – and perhaps encouraging settlement in hazardous locations. The direct effects of inter-personal violence are is also likely to reduce the adaptive capacity of individuals and households.

1.3. African urban economies and risk

1.3.1. African urban dwellers are largely poor – and African urban areas are expensive

The extent of urban poverty in Africa is frequently under-estimated because most assessments fail to take into account the non-food costs

associated with living in urban areas [55]. This under-recognition of poverty – and a frequently held attitude that urbanisation is undesirable and should be prevented [52,65] – means that policies and priorities are not set in ways that build the adaptive capacity of low-income groups in cities.

Poverty additionally and perversely increases the cost of meeting basic needs, particularly food and water. Urban food insecurity is a considerable problem, as low-income residents often having to purchase food from informal vendors at higher costs and more variable quality [7]. Similarly, residents of low-income and informal settlements frequently have to purchase water at high cost: studies in four cities show that buying sufficient municipal water can cost a five-person household without piped supplies more than 13 per cent of their income if they are to meet even minimal water needs (20 l per person per day) [56].

The high costs and poor quality of food and water mean that low-income urban residents have relatively poor health [16], and are therefore likely to be more susceptible to other shocks and stresses. While poverty increases the cost of meeting basic needs, the cost of living is also higher in real terms in urban Africa than in cities in other low-and middle-income countries. A conservative estimate suggests that, controlling for per capita GDP and other factors, urban dwellers in sub-Saharan Africa pay 11–18% more for goods and services than comparable cities worldwide [39]; another analysis of the same data suggested that prices in African cities are 20–31% higher [24]. The increment varies among different kinds of goods and services: Nakamura [99] find that food and non-alcoholic beverages cost 35% more than in other countries, while rent (55%), communications (46%) and transport (42%) – although a smaller part of most household budgets – are also considerably more expensive. Of course, there is considerable diversity within the continent: cities in Angola, Chad, the Democratic Republic of the Congo, Malawi and Mozambique have higher prices, while those in Gambia, Mauritania, Madagascar and Tanzania remain relatively affordable [99].

The higher cost of living means that urban residents in sub-Saharan Africa have to spend a larger proportion of their income to achieve the same quality of life as urban dwellers in other low- and middle-income countries. This also reduces the resources available to them to spend on risk reduction strategies such as upgrading their homes, purchasing insurance or investing in preventative health care. This is particularly true for low-income groups which already spend a larger share of their income on meeting basic needs. For example, household surveys suggest that the average urban household in Africa spends 39–59% of its budget on food; for households in the poorest quintile, the share of food expenditure reaches 44–68% [99]. Similarly, the high cost of vehicular transport is prohibitive for many low-income groups. While the widespread use of non-motorised transport might reduce the incidence of road accidents or intensity of air pollution, dependence on walking and cycling limits the mobility of low-income groups in the event of shocks such as floods or storms. This may increase their exposure and sensitivity to disaster risk.

1.3.2. African urban economies have small industrial sectors

Urbanisation often raises expectations of an "urban dividend: accelerated economic growth due to scale and agglomeration economies (discussed above; [79]) and structural transformation, as agricultural labour moves to more productive activities such as industry and services. Yet although urbanisation has been strongly associated with industrialisation in OECD and Asian countries, Africa's urbanisation has not been coupled with industrialisation (with rare exceptions, such as Johannesburg) [38].

A range of hypotheses have been put forward to explain this phenomenon. A common explanation is that the higher living costs of African cities, documented above, mean that Africa's urban labour force requires higher nominal wages than that of other low- and middle-income countries [24]. From the perspective of multinational businesses,

this translates to additional operating costs without commensurate improvements in productivity. It is therefore difficult for African cities to attract international capital to finance the development of domestic industry. Other researchers critique the assumption that urbanisation and industrialisation are necessarily linked. Fox [37] proposes that improved agricultural production, energy supply and disease control removed natural restrictions on urban population growth, allowing urbanisation. He suggests that Africa's late urbanisation is a result of region-specific barriers, such as particularly high rates of infectious and parasitic diseases, a scarcity of navigable rivers and active constraints on rural-urban migration in the colonial era. Alternatively, Gollin et al. [40] propose that urbanisation is a function of income rather than industrialisation. Resource-extracting countries such as Angola, Nigeria and Libya have therefore seen rapid urbanisation without the expected growth in manufacturing output, as the export of minerals, oil and other commodities generated higher average incomes. Finally, conflict in rural areas may contribute to urbanisation – as shown by the high numbers of refugees and other displaced people currently resident in cities such as Kampala [18].

Whatever the cause, the breakdown in the relationship between urbanisation and industrialisation significantly increases the urban population's susceptibility to risk. "Consumption cities" such as Lagos, Libraville and Luanda tend to have a larger share of workers in non-tradable services like transport, commerce and personal services (rather than manufacturing or tradable services such as finance) [40]. These sectors do not generate the same economy-wide spillovers and specialisation benefits as industrial activity [24,71], and are correlated with much higher rates of poverty and inequality than have been observed in "production cities" [40]. Without the opportunity to develop skills and organise collectively, urban workers continue to depend on precarious livelihoods and exert little influence over working conditions. The nature of economic development in African cities therefore perpetuates the vulnerabilities associated with lack of resources, knowledge and voice.

1.3.3. African urban economies have a large informal sector

The informal sector has been portrayed in myriad ways over time. Over recent decades, perceptions of the sector have shifted from the disparaging "disadvantaged residual of segmented labour markets" to the celebratory "unregulated micro entrepreneurial sector" ([51]:1159). What is celebrated in these portrayals are the private sector characteristics of informal providers [5], often associated with competition, innovation, flexibility, willingness to invest and ability to recover cost without government subsidies [59,100].

The informal economy has the potential to exacerbate local environmental degradation and other sources of risk – yet also to respond flexibly and contribute solutions to a range of challenges [20]. The fact that informal providers operate 'in the shadows' means that they lack formal state oversight and it is difficult to enforce regulation, such as water treatment standards or minimum wages [28,101]. This creates risks for urban residents as prospective consumers and workers. Yet a vibrant informal sector also allows urban residents to find alternative livelihoods in the absence or decline of formal employment opportunities. This is particularly important where informal sectors are larger and/or more dynamic than the formal economy, as seen in much of West Africa [17]. Informal businesses and networks also frequently assume responsibility for risk mitigation and management, for example through savings groups that act as informal insurance schemes [28].

This complexity is effectively illustrated by focusing on water and sanitation. Small-scale informal providers are increasingly regarded as a viable option for expanding these services, and thereby reducing risks for low-income dwellers. Yet implementation of this strategy has typically presumed that formalisation of these myriad small-scale operators is both necessary and desirable, in part to ensure more effective enforcement of regulation on water quality and environmental protection [20,28]. However, recent studies question this assumption. First, as

indicated above, formal service provision does not always entail good water quality for all [73]. Second, governments may not be able to regulate and control multiple small-scale providers without jeopardising their feasibility through taxation, corruption or the costs of compliance. Yet even where reliability is poor and price high, there can be little doubt that informal provision of essential services is better than no provision at all. Successful risk reduction strategies must recognise the significance of the informal sector in African cities, and collaborate with informal operators in sensitive sectors such as food, water and housing.

1.4. African urban governance and risk

1.4.1. Governance challenges and the creation of risk

The rapidity of sub-Saharan Africa's urban population and spatial growth has put considerable strain on urban leaders and policymakers and their ability to manage change [60]. Weak and fragmented governance arrangements across the continent have limited capacities to engage with these issues, let alone respond in ways that help address urban risk and break cycles of risk accumulation. Urban governance in Africa is made more complex by the scale of informality and depth of poverty, with a large share of economic activity and service provision taking place outside of official regulations. While frequently effective at meeting the needs of urban residents in sub-Saharan Africa, the informal sector is not necessary responsible for or capable of for ensuring equitable access to risk-reducing infrastructure and services for all places and people who require it.

Weak governance capacities and exclusionary planning systems, many of them relics of the colonial era, have resulted in much urban development occurring outside the parameters of official spatial plans, land and property markets or building codes [92,57]. Much of this peri-urban and even urban land in Africa remains under tribal authority, with traditional leaders holding significant power over natural and human resources as well as the direction of local development paths and livelihood opportunities. The roles and responsibilities of local government, traditional authorities and emerging actors such as community-based organisations are often ambiguous and contested, with adverse implications for urban risk management [102]. The interplay between formal and informal land use and planning lies at the heart of urban risk management in Africa.

African urban areas are also being shaped by transformative changes such as emerging technologies and geopolitical shifts, which are accompanied by new actors and funding structures that upset "the very conceptualisation of development as well as existing methods of achieving it" ([21]: 7). For example, the onset of private sector-led fiscal arrangements for urban construction and management during the late 20th and early 21st centuries have reduced the power of local and national decision-makers to finance and manage large infrastructure projects in ways that balance social and private returns [65]. These developments mean that African decision-makers face very different challenges and opportunities than their counterparts in other parts of the world did at equivalent levels of urbanisation.

Inadequate revenue bases means that large investments tend to be shaped by the availability of funds from other sources, including development finance and loans from international development banks. This means that policies and investments are influenced by the priorities of donors, rather than those identified by stakeholders in the city. It can also mean that investments in African cities are governed by 'projects' rather than by 'planning'. Local governments are often under-resourced in terms of technical staff as well as municipal budgets, including staff who would be responsible for data collection and planning. This means that there is limited capacity at the sub-national level to generate the evidence needed by decision-makers and that plans – where they do exist – are based on out-of-date data [92]. The absence of realistic plans, or the inability to implement them when they do exist, creates a vacuum in which other actors initiate projects. This disjointed

approach to infrastructure investment is likely to exacerbate exposure to disaster risk, not least because power relations within most cities dictate that the interests of high-income households and businesses will be protected and selectively formalised.

1.4.2. Governance for risk reduction

While the reasons for the ineffectiveness of many local governments and their planning systems in post-colonial African cities are well established, good practices and approaches in urban planning and governance in reducing risk and building resilience are not [1]. Local authorities play a major role in shaping urban vulnerability and hazard profiles through their decisions and actions around disaster preparedness, infrastructure and service provision, land management and other urban functions [22]. Yet the evidence base for local government-led coordinated disaster risk reduction is limited and lack of capacity in municipal authorities remains a critical challenge [63].

Looking beyond the formal mechanisms of government, urban planning and investment in African cities is governed by a diverse and fragmented set of actors and processes. These span the public, private and civic sectors, and may be formal or informal (including traditional authorities). This has led to the development of highly complex institutions that are navigated by actors with varying degrees of power. Decisions within and about cities may therefore be driven by canonical or shadow networks within and beyond municipal institutions [47]. Integrating risk reduction agendas into these processes is critical to building long-term resilience and reducing disaster losses. At the same time, however, there is a need to critically examine and shift these norms to address the drivers of vulnerability: marginalisation, exclusion and inequality. More adaptive and inclusive forms of governance need to be pioneered which explicitly work with and respond to the needs of those who are most exposed to risk.

In their attempts to overcome risk of various types, local authorities are increasingly acting in partnership or through the combined interventions of multiple actors at multiple scales [22]. For example, local authorities in Malawi, Tanzania, Zambia and Zimbabwe partnered with organised communities of the urban poor in order to map sanitation needs, develop local maps and co-produce basic infrastructure [12]. Nine African cities have joined C40 Cities while many more have joined ICLEI-Local Governments for Sustainability, transnational networks that support their members to develop climate mitigation and adaptation plans (one element of the spectrum of risks that cities face). Such partnerships and collaboration between state and non-state actors can help to overcome capacity constraints and offer new sources of knowledge to inform risk reduction strategies.

1.5. Conclusion

The discussion presented above demonstrates how many of the key characteristics of towns and cities in sub-Saharan Africa – some of which are unique to this region – play a significant role in creating risk, but also offer significant potential for addressing it. These include the broad features of urbanisation and urbanism (demographic, spatial, connectivity), the social dimensions (including those shaped by gender and age), the economic dimensions (particularly the scale of poverty and informality), and the over-arching governance processes that both reflect and shape these other elements.

Taken together, what might this body of material indicate in relation to understanding and addressing risk in these cities? First, it shows that risk production in urban centres is complex. It takes us beyond looking only at hazards and vulnerability, to considering the multiple ways in which hazards are created (notably through urban expansion into exposed locations and through failures in infrastructure provision). It also draws attention to the multiple ways in which vulnerability is shaped, particularly the socio-political norms that determine access to opportunity and resources. Second, it shows that there is a need for policy makers at multiple scales to engage with both the proximate and

ultimate drivers of risk. While it is inappropriate to ignore the underlying drivers of risk to focus on the surface manifestations, the intransigent nature of these forces means that some amelioration of the immediate expression of risk is often necessary.

Engaging with this in practice is tricky, and there are few strong examples from Africa either of how addressing broad urban challenges has also reduced risk, or how risk reduction activities have reshaped urban politics more broadly. Indications of how this might be successful can be seen in neighbourhood-level responses to particular hazards that have re-shaped citizen-state relationships. The co-production of housing and infrastructure in particular not only directly address specific risks, but has also demonstrated that it can create space for joint action by civil society and governments (despite significant conflicts in many other areas of activity), enabling both to prepare for and respond to shocks and stresses more effectively. Examples include the construction of community sanitation blocks to reduce disease in Kampala [30], the enumeration of informal settlements in Nairobi to equip organised communities with the evidence base to negotiate effectively with local authorities [93] and the construction of walkway pavements, drains and green space to reduce run-off in Johannesburg [2]. Such alliances and networks, which amplify the voices and build the capacities of vulnerable groups, have considerable potential to ameliorate the political, economic and social drivers of risk in urban areas.

Three specific implications can be drawn from the analysis above. First, the ways that the distinctive characteristics of African urban development create and manage risk is poorly understood. The literature reviewed includes few explicit efforts at generating or analysing empirical data that speaks to the generation or reduction of risk at the city scale. Second, the complex inter-relationships described above indicate that risk management needs to be taken into account in all urban development efforts in the continent. Efforts to drive urban economic growth, reform urban planning, and enhance human wellbeing will all need to be seen through a lens of hazards and vulnerabilities to avoid being undermined by shocks and stresses. Third, and related to this, the risk reduction community must not confine its efforts in African cities to narrow sectoral activities. Risk reduction practitioners need to understand and engage with the multiple dimensions of urban development – spatial forms, societies, economies and governance structures – if they are to achieve their goals of reducing human suffering and maintaining and enhancing development gains.

Acknowledgements

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