11 Climate Change Adaptation and African Cities

Understanding the Impact of Government and Governance on Future Action

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INTRODUCTION

Some residents of Tandale Ward, in the city of Dar es Salaam, Tanzania, have made significant investments in their homes to respond to weather events exacerbated by climatic change. Like other low-income areas in the city (see Kiunsi 2013), Tandale is in a very low-lying area and is vulnerable to flooding. As a result, many households have built secondary walls around the base of their houses to prevent water and associated debris from entering their homes when flooding occurs. Figure 11.1 shows a wall built around the base of a home in Tandale, and Figure 11.2 shows the proximity of houses to a river that is prone to flooding during extreme rain events.

While some might suggest that the actions of Tandale residents illustrate grassroots climate adaptation, a more accurate description for these activities is 'coping'. Far from semantics, the distinction between 'coping' and 'adaptation' is important when thinking about a long-term and institutionalized response to climate change in cities (Bulkeley & Tufts 2013). Coping mechanisms represent any actions that respond to potential disaster or impending shocks; adaptation refers to the deliberate, intended and purposeful actions of governments and formal institutions to respond to climate risks and vulnerabilities—the kind of action that is thought necessary for resilience (see Bulkeley & Tufts 2013; Pelling 2011). Thus, when discussing climate change adaptation or mitigation, formal international, national and local institutions and organizations must be considered: the formal entities that can leverage financial resources to invest in climate adaptation and mitigation measures; that can engage with citizens that are coping with risks to best respond to their needs; and that, in theory, have tools and mechanisms to support (and enforce) actions to improve resilience.

International reports on climate change impacts and adaptation are replete with statements emphasizing the role that local and urban governments should play in successful adaptation and the need for vertical and horizontal coordination and collaboration between governments, civil society and the private sector (see section 8.4, IPCC WG II, 2014). The

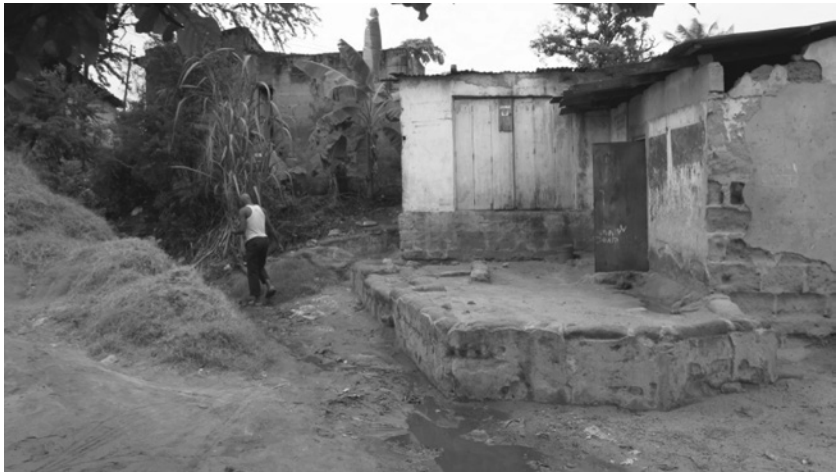

Figure 11.1 Home with secondary wall, Tandale Ward, Dar es Salaam.
Photo by Christopher Gore.

Figure 11.2 River in Tandale Ward, with houses near river.
Photo by Christopher Gore.

2014 IPCC Working Group II report on impacts, adaptation and vulnerability states that there is evidence that 'well-governed cities have a strong basis for building climate resilience' (IPCC 2014, 4; 49). The emphasis on the role of local governments and multilevel governance is long standing and important. Naturally, however, these prescriptions under-emphasize

the stark, historic and present challenges that local governments in poor countries confront in leveraging resources to respond to climate risks, and in working with citizens and national governments in ways necessary to produce resiliency. Most critically, these observations under-emphasize the political sensitivity of climate adaptation strategies (see Bulkeley & Tufts 2013); "addressing climate change in the city provokes fundamental political tensions over how and for whom environmental protection . . . should be pursued" (Bulkeley 2010, 15). Resiliency depends on "effective political organization and receptive political systems with the capacity both to respond positively to citizen demands and to learn" and ". . . the quality of governance, especially local governance" (Satterthwaite 2013, 388). Yet cities in sub-Saharan Africa[1], are known for limited financial resources, tense relations with national governments, and inadequate services and support for citizens. Hence, to reflect and theorize on cities and climate change in Africa means to undertake a deeply political exercise; what is needed for resiliency is daunting for many reasons explained below, but most fundamentally, requires an ambitious agenda that is likely to generate conflict.

With respect to financial resources, for example, in many countries, annual city expenditures per person are extremely low. A study of ten African cities between 2007 and 2009 showed that when Johannesburg was excluded, the average expenditure per person was U.S. $32.93 (Stren 2014, 24). Adding to this lack of resources is an historic tension between urban and national governments and a general lack of national-urban cooperation to respond to the rapid population changes in African cities and the associated infrastructural and housing shortages (Gore & Muwanga 2013; Goodfellow & Titeca 2012; Resnick 2011). Thus, for resource poor and underserviced cities in Africa, the space between what experts and the international community say is needed to produce resiliency and the reality of urban conditions, management and governance is wide. This observation is not intended to underestimate the importance of African cities' engagement in climate knowledge networks, international conferences and debates, or their own knowledge of the challenges they confront. Research on cities and climate change clearly acknowledges that the diffusion of information and ideas through transnational networks are important in prompting city initiatives (Carmin, Anguelovski & Roberts 2012; Schreurs 2008; Bulkeley & Betsill 2005). But in recognizing the international engagement of African urban leaders, it is imperative to recognize the importance of endogenous factors as motivators for city climate response and how domestic governance—the character of the relationship between city governments and citizens and city governments and national governments—has an indelible impact on a city's capacity to respond to the climate risks it confronts. One of the best examples of the importance of endogenous leadership in Africa comes from the city of Durban, where climate leadership came from within the city (Carmin, Anguelovski & Roberts 2012). Outside Africa, research has shown how the internal institutional structure of cities affects

climate activities (Burch 2010a; 2010b; Dannevig, Hovelsrud, & Husabø 2013; Meijerink & Stiller 2013). Thus, this chapter argues that to understand how African cities are responding and may respond to climate change, how they engage in national and international processes, and their prospects for responding to the global climate challenge, there is a need to get 'back to basics': there is a need to understand how and why city governments are structured and function the way they are; how these characteristics shape response to urban challenges generally and climate risks specifically; and the implications of altering these structures and functions. The chapter argues that a central goal of future research on African cities and climate change must be to understand how the structure of city governments in Africa and the character of their relationship with citizens, other governments and the international community—the character of governance—will affect future climate adaptation and resiliency.

The chapter continues by first discussing some central challenges in African cities today, particularly in relation to their rapid change. The relationship between these changes and general expected effects of climate change are also highlighted. Then, two examples of cities in East Africa are presented and contrasted: Kampala, Uganda, and Dar es Salaam, Tanzania. The cases have similar general challenges with respect to urban management and climate change, but the structure of each city government is very different, and each city's relations with its citizens and the national government are also very different. Thus, while both cities are engaged in activities responsive to climate risks, the structure of government and character of governance in each city has historically and is presently going to produce significant challenges in establishing long-term institutionalized and sustained climate adaptation. The chapter concludes by making some observations about the future of African cities in climate action and governance in light of the emphasis on the structure and function of city governments.

Following in the spirit of the central questions this book takes up, the chapter reveals that African cities *are* engaged formally in local, national and global climate processes, and they *are* learning how to engage with international networks and communities in seeking both resources and support, and to advocate for action. As a result, the prospect of crafting responses to the global climate challenge and local climate risks is high. The challenge that remains is whether the current political context of African cities and structure of city governments can adapt in a manner and pace that is deemed necessary to respond to climate risks. For theory, the implications are significant and raise questions about the conditions when international learning and knowledge generation can or do translate into political and policy change domestically. Equally, if the change can take place, what concerns and implications of that change will arise, particularly for the populations most vulnerable. This chapter argues that there is a significant need to return to 'first principles' when considering city climate governance and theory in Africa: the structure of city governments, their relationship with

national governments, and their capacity to implement climate resilient actions will depend on a national enabling environment that is fiscally and politically supportive of city climate leadership and action.

AFRICAN CITIES AND CLIMATE CHANGE: THE EFFECT OF GOVERNMENT AND GOVERNANCE

For several important reasons, African cities are anomalous globally. Compared to other regions of the world, the national percentage of African urban populations is lower than any other region. According to the UN Population Division, approximately 36.7 percent of Africans live in urban areas (UN Population Division 2012). This comparatively low total population of urban residents, however, is changing rapidly. Compared to other regions of the world, the average annual rate of urban growth is one of the highest in the world: from 2005 to 2010 average annual urban growth was estimated to be 3.71 percent, which was higher than China, Latin America, Europe and North America (Stren 2014, S20). While migration to cities contributes to population increase it is the not the dominant reason city populations are growing rapidly (see Potts 2009). The most dominant contributor to population growth is due to natural increase.

One dominant concern amongst African urban scholars is the globally and historically unprecedented disconnect between urban population growth and economic growth in many African countries. Population growth is not consistent with economic growth in African cities, leading some international agencies to argue that "the wisdom of seeking economic survival in the largest cities has become doubtful" (UN-Habitat 2008, 106). Given this context, it is not surprising to learn that service delivery and housing have not met need and demand. While the total African urban population living in informal settlements or 'slums' is expected to decrease over time, by 2030 still over 50 percent of urban residents are expected to be living in areas that are un- or under-serviced, that lack secure tenure or property rights, that are dominated by unregulated structures, and where formal physical planning is difficult to implement (Stren 2014, S22).

The challenge of urban development and management in the majority of large, medium and small African cities is ongoing and will persist for the medium to long term. Given this, for the foreseeable future African city governments will remain deeply dependent on national financing and collaboration, along with international financing, to respond to basic service needs as well as climate-specific needs. Improvements in infrastructure and housing for climate resiliency, for example, will depend on leveraging financial resources. Yet, national governments in many countries have been very slow to react to rapid urban change and there exists deep acrimony between many African city governments and national governments historically and today (see Resnick 2011; Esser 2012; Gore & Muwanga 2013). This has left

an indelible impact on the quality of service delivery and urban governance generally. When the complexity of climate change is added into this mix, the conclusion is not positive: "The multi-dimensional complexities of urban form, urbanization and urban governance in Africa have left city authorities and governments unprepared for climate change" (Lwasa 2010b, 20). The recent IPCC, Working Group II, report *Climate Change 2014: Impacts, Adaptation, Vulnerability* provides detailed information on why the link between climate and urbanization in Africa warrants significant attention.

For the continent as a whole, the IPCC reports general impacts that are alarming: general warming across the continent; likely reductions in precipitation in North and southwest Africa, while producing general water stress throughout the continent; increases in intensity of rainfall events, with a corresponding negative impact on crop production due to increasing temperatures and changes in precipitation. One of the most challenging climate change impacts in Africa, as well as globally, is that climate change is expected to exacerbate vulnerability, particularly by increasing the burden or multiplying existing health vulnerabilities, such as safe water, sanitation, and food insecurity.

For urban areas in Africa specifically, the IPCC report highlights the vulnerability of populations living in coastal areas that may be displaced due to storm events and sea level rise. Heavy rain events and poor urban infrastructure have and will continue to produce concerns about flooding and general infrastructure damage, particularly the households of poor and vulnerable populations. The report also notes that these vulnerabilities will be accentuated by the low adaptive capacity of local governments:

> Weak local government creates and exacerbates problems including the lack of appropriate regulatory structures and mandates; poor or no planning; lack of or poor data; lack of disaster risk reduction strategies; poor servicing and infrastructure (particularly waste management and drainage); uncontrolled settlement of high-risk areas such as floodplains, wetlands, and coastlines; ecosystem degradation; competing development priorities and timelines; and a lack of coordination among government agencies. (IPCC WG II, 2014, Chapter 22, 28)

Owing to this long list of concerns, in the last decade or more, multilateral, bilateral and international non-government organizations have invested heavily in risk assessments and planning for adaptation to climate change in the sub-continent. But while financing for climate adaptation projects exist, the success and effect of these initiatives cannot be considered in the absence of understanding how the very authorities and institutions on the front line of climate response do function and may function to address risks; that is, the structure and capacity of city governments and their relations with citizens and governments will have a significant bearing on the potential to produce effective climate governance nationally and at the city level. How cities

function, what national governments are doing to support or undermine city policy, and how city and national governments engage with citizens will have a bearing on future climate resiliency (Satterthwaite 2013).

Two cases of cities in East Africa are now presented to highlight the relationship between the structure of urban government (the formal administrative structure inclusive of elected office holders and the bureaucracy), the character of urban governance (the character or relations between governments and non-government entities), and climate response. Two cases are presented rather than one longer case in order to contrast how the structure of government in two African cities has an immediate, direct and potentially different effect on urban policy and engagement with national governments and citizens—conditions deemed necessary for future climate resiliency. The case of Kampala, Uganda, is first presented, followed by Dar es Salaam, Tanzania. General information about the cities is presented first, followed by a brief review of climate-specific issues affecting the cities. This climate context is followed by an explanation of the political and administrative structure of the cities and how this has historically effected policy action and what it suggests for future climate action.

KAMPALA, UGANDA

The city of Kampala is the capital of the East African country of Uganda. It is a relatively small country of about 236,000 square kilometers, on the northern shore of Lake Victoria, bordering South Sudan to the north, Kenya to the east, Tanzania and Rwanda to the southwest, Rwanda and the Democratic Republic of the Congo to the west. Despite its small geographic size, it has one of the fastest-growing populations in the world, at near 5 percent per year (Lambright 2014).In 2002, the national census revealed that the population was 23 million. In late August 2014, the latest national census took place. As of October 2014, the results of the census were still being compiled. In 2012, the UN Population Division estimated that the national population would be near 40 million, and by 2025 near 55 million people (UN Population Division 2012). In 2002, Kampala had an estimated population of about 1.2 million; by 2011 the Uganda Bureau of Statistics projected the population to be 1.7 million (Kasaija & Lwasa 2014). Depending on how you define 'Kampala' and with whom you are speaking, the daytime population of the city and its environs may increase to 2.5 or 3 million people. The population changes in Uganda generally and Kampala specifically will be exacerbated in future by the very low national urban population—approximately 15 percent of the total population—and the very young population, thereby creating a scenario where natural increase is a central driver of population change. The speed of population change, combined with problems with urban management and service delivery (discussed more below), has left the city with large deficits

in housing, infrastructure and general service delivery. In addition, there is a historical and colonial legacy of water, waste collection and sewerage serving high-income areas of the city leaving low-income areas under-serviced and vulnerable (Gore & Gopakumar, forthcoming). This service deficit is amplified by the physical location of low-income settlements in Kampala. The formal city of Kampala surrounds several large hills, with corresponding valleys in between. Generally, as is common in East Africa, low-income residential areas dominate low-lying areas. Not surprisingly, these areas are more vulnerable to flooding and heavy rainfall events, which themselves are expected to increase and intensify under future climate change.

The most serious and often quoted climate change impacts on Kampala relate to rainfall and flooding (see Lwasa 2010a). Lwasa (2010a) reports that over the last twenty years, the frequency of flooding events in Kampala due to more intense rainfall has increased. Conversely, there is also a concern that under climatic change sources of drinking water could decrease, which could compromise water supply, or at minimum require new investments in infrastructure to access new water sources. Flooding and high volumes of runoff produce other environmental and health stresses, including destruction of homes and potential for exposure to waterborne diseases, such as malaria, dysentery and cholera, which result from stagnant water and untreated sewage. High levels of poverty in the city make these conditions worse. While Kampala generated 42 percent of national economic growth between 2005–2009, and poverty in rural areas decreased during this time, inequality nationally, and poverty in Kampala, increased during this period (World Bank 2013, 29). Kampala's estimated poverty level was about 30 percent of the population in 2010 (Lwasa 2010a, 167).

In light of these challenges and climatic conditions, it has been argued that "Kampala city requires restructuring of spatial planning and urban governance systems by making plans responsive to current and future [climate] challenges" (Lwasa 2010a, 168). In late 2010, a new 'governance system' did arise in Kampala. But the reason for this change was not climate-related (as would be expected). Change came as a result of a long history of conflict and tension between the national and city government, and the Kingdom of Buganda (see Goodfellow & Lindemann 2013), which owns approximately half of the land in Kampala city proper. The question that is most relevant when thinking about the city and climate change is whether the changes in the structure of urban government and the character of governance align with characteristics deemed necessary for urban climate resilience.

Until late 2010, Kampala had been governed like most cities, with a popularly elected mayor and council responsible for policy and program implementation. Like many cities in Africa, there had been a tendency, however, for a majority of Kampala elected officials, including mayors, to represent political parties in opposition to the President's (see Resnick 2011; Esser 2012). Adding to this, cases of corruption and poor service delivery in the city were common, and overall, despite some very positive environmental

initiatives relating to urban food production and security (see Cole et al. 2008), the city was largely seen as being ineffectual. The national government, however, did not help to minimize this image. Despite the size of the city relative to any other urban area in the country, its dominance or primacy in terms of economic contributions to national wealth, and the challenges it encountered in responding to rapid urban change, it was funded in the same manner as any other district in the country (see Gore & Muwanga 2013). In addition, urban areas and Kampala specifically, had never been prioritized or generally referenced in national poverty or development strategies (Mitlin 2004; Gore 2008); there was no national urban policy; and the dramatic urban change that was befalling the country was not well recognized by national leadership until almost 2010 (Gore & Muwanga 2013, 3). Thus, infrastructure and service quality in the city prior to the national government's takeover was poor and generally deteriorating, making it somewhat easy to convince the public that a national takeover of the city was in the best interest of citizens and the country. Indeed, just after the formal takeover of the city, national and local candidates aligned with the President's political party, the National Resistance Party, and President Yoweri Museveni himself, received more support from Kampala voters than ever previously.

Thus, in late 2010, the national government passed the Kampala Capital City Bill, which transferred authority for the city directly to the national government.

The new bill produced a dramatic change in the structure of capital city government and urban governance, vesting authority for planning and development decisions in an Executive Director and ten Directors. While popular local elections remain in place, the popularly elected mayor and council have no direct authority over spending, therefore lacking ". . . fiscal autonomy—a *de facto* unfunded mandate" (Gore & Muwanga 2013, 12). The Executive Director is appointed by the President and accountable to Cabinet and a Minister responsible for Kampala. The Kampala Capital City Authority (KCCA) has replaced the former city council. The KCCA consists of elected councillors but the Directors of various city departments, such as Physical Planning and Physical Services and the Environment, take direction from the Executive Director and not the KCCA. As a result, while the elected councillors make recommendations for city programs, the Directors are ultimately accountable to the Executive Director and not to individuals popularly elected.

In 2014, Kampala City is a much different organization than previously. Annual reports to Parliament take stock of activities and expenditures, along with future initiatives. A majority of technical city staff has changed, with bureaucratic leaders clearly aligned with the mandates set out by the Executive Director. Further, while there have been many controversies relating to city government policy decisions, such as relating to petty street traders and illegal buildings, the general sentiment in the city is that roads and

infrastructure have improved and self-monitoring by the city suggests that waste collection has increased; revenue generation has increased; social development activities are documented, such as support for urban farmers; and enforcement of laws has increased (Government of Uganda 2014).

With respect to climate change specifically, the Executive Director, Ms. Jennifer Musisi, has also spoken openly and directly about taking actions to respond to climate change. At the 2014 Technical Experts Meeting on the Urban Environment in Bonn, Germany, Musisi announced several initiatives she connected to climate change and improved resiliency: solar-powered street lighting along all new road lighting systems in the city; construction of new channels to minimize flooding in city suburbs; new electricity generation using solid waste from the municipal landfill site; and the promotion of new stoves to reduce charcoal and wood consumption and reduce particulate matter in the city. These announcements, including the Executive Director's direct participation in an international meeting and networking with organizations like the Global Environment Facility and UN-Habitat, clearly reveal that climate change and financing for climate resiliency are priorities. But do these actions suggest a positive path for climate resiliency?

One of the critical needs for low-income cities is support and collaboration with national governments and international institutions. Previously, the relationship between Kampala and the national government was poor and the city had a poor record of performance, which together had a negative indirect effect on the capacity for the city to attract international finance and support. Hence, from a positive perspective, the city seems engaged in a multilevel process of upward vertical collaboration with the national government and international actors. Horizontal collaboration, networking and knowledge sharing at international events are also evident, which, as earlier noted, is always important in city climate action. One large uncertainty that remains, however, is how and if the city will and can build bridges with citizens and civil society organizations and begin to establish and reinvigorate the conditions necessary for urban climate governance that responds to citizen needs and distributes action and benefits equitably. Acknowledging the improvements to the city since the KCCA came into being, we note that one of the biggest challenges in Kampala will be how to move beyond a piecemeal approach to city development and begin to work with the many civil society organizations engaged in such things as housing, flood response and slum upgrading as real partners (Kasaiji and Lwasa 2014). Further, it remains that the technical arm of the city must overcome deeply rooted public suspicion and concern that the takeover of the city was as much a political maneuver of the President to undermine opposition as it was a decision deemed necessary to respond to the failures of city governance and service improvement (see Lambright 2014). Indeed, whether one of the outcomes of the new structure of city government produces more programs to address climate risks, these cannot be equated with a city that is climate adaptive or resilient. The national government's takeover of the city was deeply political

and built on a history of conflict between citizens and levels of government. It will take time before the actions of the new city government will be able to show that environmental and climate policies and programs are sensitive to the city as a whole, and not reasserting political tensions or conflicts that hold a lasting legacy in the city. So while the new city government of Kampala does seem to be moving in a direction that is illustrative of a city with the resources and relations needed for climate adaptation, climate resilience will remain dependent on how the new structure of the city government engages in the social and political task with its citizens and civil society organizations that are necessary for future resilience. Further, both pragmatically and theoretically, if the national government's takeover of the city does produce positive outcomes for climate resiliency, then very careful and challenging debates will need to unfold about whether the risks of climate are urgent enough in some cities to accept or endorse a limit on local democracy and the influence of popularly elected councillors on projects and funding in the city. It is important to remember that many of the most popular and beautifully planned cities in the world, like Paris, or cities deemed 'successful' in the developing world, like Curitiba, Brazil, owe their 'success' to national leaders that took power undemocratically and had a vision for city development that was facilitated by their power. Is climate resiliency in poor urban environments worthy of these national interventions? Clearly authoritarian interventions are not necessary for city climate adaptation; but for future research, it is incumbent to try to understand the conditions (political, social and administrative) that lead to positive initiatives, such as in Durban, South Africa, where endogenous leadership was critical (see Carmin, Anguelovski & Roberts 2012).

Turning to a different example, the city of Dar es Salaam similarly shows evidence of engagement with climate issues internationally, but here the fragmented model of city government produces different concerns about the capacity of the city-region to produce climate actions that will produce resiliency.

DAR ES SALAAM, TANZANIA

Dar es Salaam, Tanzania, is an historic port city on the east coast of Africa. Tanzania, bordered by Kenya to the north, Uganda, Burundi, Rwanda to the northwest, Democratic Republic of Congo to the west, and Zambia, Malawi, and Mozambique to the south, is about 945,000 square kilometers, over three times the geographic size of Uganda. The population of Tanzania, like Uganda, is also increasing very rapidly. According to the United Nations Population Division (2012), in 2005, the national population was estimated at almost 38.8 million people. By 2010, the population had increased to 45 million. By 2015, it is estimated that the population will reach 52 million, and by 2025 almost 70 million.

Dar es Salaam is the dominant, primate city in Tanzania, but functions with a fragmented government structure. When people discuss the city of Dar es Salaam, they are actually referring to the formal Region of Dar es Salaam—a national region. This region is made up of three national districts, which are also three independent municipalities—Illala, Kinondoni and Temeke. Each of these municipalities has an independent mayor and council. The city/region as a whole is overseen by a nationally appointed Regional Commissioner, but there also exists a Dar es Salaam City Council and Mayor of Dar es Salaam. The Dar es Salaam City Council is supposed to help coordinate activities for the city/region as a whole, although it has no legislative authority to do so. This administrative context is significant when thinking about climate action in the city and will be discussed further below.

While the political capital of Tanzania was formally moved from Dar es Salaam to Dodoma in 1973, and the National Assembly opened there in 1996, many central government offices remain in Dar es Salaam, and the city remains the economic center of the country. Dar es Salaam generates over 70 percent of the national gross domestic product (UN-Habitat 2009, 6). In 2011, Dar es Salaam's population was estimated to be around 4 million people, "which is approximately ten percent of the country's total population and 50 percent of its urban population. With a population growth of 4.3 percent per year, Dar es Salaam has become the third fastest growing city in Africa and among the ten fastest growing cities in the world" (World Bank 2011). Not surprisingly, this speed of growth, combined with the size of the city, has produced serious challenges in service delivery.

Some of the most regularly cited environmental service provision challenges in Dar es Salaam are drinking water provision, housing and housing quality, and general infrastructure quality. The infrastructure for water provision dates back almost fifty years; the quality of the infrastructure has been so poor in the recent past that 60 percent of water pumped is lost; and it is estimated that only 30 percent of city residents have access to tap water (Kyessi 2005, 3). Financing service provision is also a major problem. A 2004 report by ActionAid revealed that only 26 percent of people receiving water were being billed for it, and even those connected to the city's water system regularly went weeks without water (Dill 2009, 614). Further, only about 10 percent of the population is connected to the sewer system (Kiunisi 2013, 323). The health outcomes from these conditions are predictable: "cholera, dysentery and other gastrointestinal diseases are commonplace in Dar es Salaam" (Dill 2009, 614).

The number of people living in informal or unplanned settlements in Dar es Salaam is also very high, with the percentage of households categorized as 'slum households' ranging between 65–80 percent (UN-Habitat 2008; Kiunsi 2013). The physical quality of these dwellings combined with their location in low-lying areas, often near water courses, in valleys, or near coastal wetlands, means that they are very vulnerable to extreme weather

events such as heavy rainfall, which cause flooding, erosion and land degradation. Conversely, in the past ten years, the city has also experienced drought and increases in mean temperatures, which are expected to continue (World Bank, n.d.). In short, climatic change is expected to exacerbate already difficult infrastructure and human welfare challenges: "Dar es Salaam is a city where urban poverty and climate variability—floods as well as drought—jointly create a situation of high vulnerability for the poor that affects crucial aspects of their lives, e.g., health, sanitation and access to clean water, and safety of housing and property" (START et al. 2011). More generally,

> Tanzania is predicted to become warmer by 2.5° to 4.5°C by the year 2080. . . . Precipitation is projected to increase in all rainfall seasons, with coastal and southern parts experiencing the greatest increases. Dar es Salaam has already become warmer—data from the TMA indicate an increase in both minimum and maximum temperatures over the last four to five decades. The data also show a decrease in the number of rainfall days and mean annual rainfall, and increased variability in rainfall intensity. (Kiunsi 2013, 325)

The costs of responding to these climatic challenges are enormous. The stormwater drains in Dar es Salaam were constructed in the 1950s and are deemed largely dysfunctional; the estimated cost of building a sea wall along the 100km coastline of Dar es Salaam to protect it from rising sea levels has been put at $270 billion; when the cost of upgrading housing is added to some of these projected costs and needs, then it is clear that costs of responding to climate risks are well beyond the national and local economies (Kithiia 2011, 177).

The real and expected effects of climate change on Dar es Salaam are well known. The city has been studied extensively, partly due to the many additional risks it confronts due to being on a coast as opposed to inland, like Kampala, and partly due to the speed of change it has experienced as an urban agglomeration. There are also many projects underway in the city to upgrade services, infrastructure, and housing, and to reduce congestion, such as the Dar es Salaam Rapid Transit (DART) system. Many other mitigation activities exist, such as: ". . . tree planting; the protection of coral reefs and mangrove vegetation; using more efficient cooking stoves; promoting the use of natural gas instead of oil and coal or using briquettes (to cut down on fuelwood/charcoal use); using energy-saving street lights; an improved public transport system; and methane gas capture at waste disposal sites" (Kiunsi 2013, 331). Funding for these activities and risk assessments have come from various international sources such as the European Union, the World Bank, UN-Habitat, Cities Alliance, and the International Council for Local Environmental Initiatives (ICLEI). Many of these international funding initiatives will benefit Dar es Salaam directly, but, importantly, the funds

generally move through national ministries, particularly the Prime Minister's Office, which signs off on international project funding. Hence, Dar es Salaam is formally engaged in multilevel climate actions and clearly connected to the international system through funding and knowledge sharing.

Linkages between Dar es Salaam and the international community and knowledge networks also come about through local representatives. As a reminder, the City of Dar es Salaam is formally governed through a fragmented administrative structure—three independent municipalities, each with a popularly elected council and mayor; a city mayor and council that aims to coordinate city activities and initiatives but without legislative authority to do so; and a nationally appointed Regional Commissioner. One of the outcomes of this structure is that there are situations where the mayor of Dar es Salaam will participate in international meetings, while the mayor of one of three Dar es Salaam municipalities will participate in a different meeting or network. For example, the World Mayors Council on Climate Change has two mayors from the Region of Dar es Salaam as members—the mayor of the Municipality of Kinondoni and Temeke. Meanwhile, the mayor of Dar es Salaam—the city as a whole—represented the city on the World Bank's Mayor's Task Force on Climate Change, Disaster Risk and the Urban Poor and has represented the city as a whole at the C40 Cities Climate Leadership Group. Yet, the Dar es Salaam mayor has no authority to implement a city-wide agenda without the support of the three other mayors and therefore must rely on cooperation, coercion or financial incentives from that national government or international sources to produce city-wide actions. Thus, city political leaders are engaged in knowledge sharing and networking internationally. But this engagement does not mean that the character of the relations between the city, citizens and government and non-government entities—the character of multilevel or local climate governance—will produce the conditions necessary for climate adaptation and resiliency.

The structural complexity of Dar es Salaam has challenged and does challenge the capacity for city-wide actions that are deemed necessary to adapt to climate change successfully and to make climate adaptation institutionalized in city administration. Dar es Salaam City Council staff, for example, have no authority to implement physical planning standards for the city as a whole and have not been engaged in the development of a much anticipated Master Plan (Author's observation, June 2014). Further, it is important to remember that the structure of the city highlighted here masks the other layers of authority and representation at lower levels in the city, such as the street-level elected committees (*mtaa* committees) and the divisions that make up districts. Hence, while the lowest levels of local authority may have long-held systems of engagement with citizens through a history of decentralization—a case similar in Uganda—and therefore the quality of relations at this scale may be strong, these connections cannot be

considered independent of the vertical relations and collaboration deemed necessary for climate resilience. Once again, a scenario arises where the very conditions deemed important for citizen engagement and democracy may also prove to be—and often do prove to be—impediments to the kind of city-wide, rapid, institutionalized response to climate change that is needed. The pragmatic steps needed to respond to climate adaptation and produce resiliency are deeply political (see Bulkelely & Tufts 2013): in Dar es Salaam, to move people away from low-lying areas and into new housing settlements or for the national government to restructure the city to provide more authority to the City Council would have significant political fallout. These challenges are amplified by a history of low national attention to urban issues, such as in Uganda. Cities and national urban centers have not received a lot of prominence in national development and climate strategies in the country—something similar in Uganda; the country's 2007 National Adaptation Programme of Action, for example, emphasized rural and natural resource issues, with human settlements listed as the ninth of eleven priority sectors (Kiunsi 2013, 321–322).

Unlike Kampala, no large national intervention in the structure of government in Dar es Salaam has occurred to date. Local political and technical leaders from both cities are engaged in international climate forums and have received funding for risk assessments and improvements in physical infrastructure that are necessary in the face of climate risk. Further, as should be expected in poor urban settings, both cities depend on their national governments to facilitate international financial transfers and for the legislative authority to implement climate-responsive changes in their cities. While both cities are structured differently, the same questions linger about the effect of those structures on climate adaptation. While Kampala's structure of government has changed and become more professionalized, having stronger technical capacity, and having the mandate of the President to implement changes and improvements, its success in fostering and building relations with Kampala citizens will be tested in the years to come owing to long-standing political conflict in the city. Conversely, while Dar es Salaam's government structure, like Kampala's old structure, is rooted in an ethos of democratic decentralization, it is now proving to be a point of clear debate, frustration and contention in urban management for the city—the structure that was created and lingers due to assumptions of better local representation produces extremely large challenges for city and region-wide coordination. In both cities, the central point that must be considered is the relationship between the structure of government, the character of governance and the effect of both of these on the capacity of the cities to respond to the looming challenge of climate change. How the structure of government affects the ability, willingness and necessity of governments at multiple levels to engage with citizens will have a lasting impact on the capacity of cities to respond to climate change.

CONCLUSION

This chapter has examined two cities in East Africa that are both affected by and attempting to respond to quite significant challenges exacerbated by climatic change. In both cases, the cities are clearly planning for a future where the cities want to be part of an international community of cities engaged in climate activities. As other chapters in this book highlight, Dar es Salaam and Kampala, like other cities throughout Africa, are engaging with the international system through knowledge sharing, networking and financial opportunities. This is significant: African cities may be poor, lack capacity and are struggling with extraordinarily rapid change, but they are not disconnected from the debates taking place internationally and from the networks of cities that have materialized in the last two decades to respond to climate change. Given this, it is important to recognize the potential for African cities to play an important role in the future of international climate governance. African cities are not passive bystanders to the global climate challenge. While this observation is important in order to combat the mainstream perception of African cities as being directionless and bastions of violence or poverty, a more important observation for international climate governance is whether and how the complexity of African urban government and governance can and will impact pragmatic responses to climate change and theory of cities and climate change.

Pragmatically, projects and programs to respond to climate risks in African cities must be cognizant of the history and power dynamics of city governments and city politics. Climate risks may produce some isolated impacts in cities, but overall climate impacts will be at a regional and city-wide scale. For this reason, lack of attention to past political debates, conflicts and problems in cities, particularly national-local relations, and the effect of these relations on project implementation, has the potential to reproduce inequities in the city and to miss critical points of administrative leadership that may not be apparent from an organizational chart. Understanding why a government is structured the way it is, the past and present outcomes of that structure, and how to work within that structure to produce broad benefits in project implementation is essential for the institutionalization of climate adaptation.

Theoretically, the fact that African cities are engaged in international climate networks and domestic climate activities produces an exciting opportunity for future research and knowledge generation. It has only been in recent years that scholars globally have begun to examine the correlation between city structure and climate actions. This, however, will be a critical undertaking in the years to come. As the case of Durban, South Africa, revealed, internal bureaucratic leadership can produce significant city climate response (see Carmin, Anguelovski & Roberts 2012). Further, international research reveals that the structure of government seems to affect urban climate and environmental initiatives (Bae and Feoick 2013), as does

the relationships within government (Burch 2010a; 2010b). Given this, and recognizing one of the central questions in this book, there is a significant need to better understand how city governments are using climate change to justify policy development; the democratic and policy implications of doing this; and, whether cities are (re)asserting their political and policy importance nationally and internationally due to their front-line role in responding to climate change.

African cities are acting and want to act to respond to climate change. In supporting these actions and following their trajectory, it is imperative not to lose sight of the foundations of urban policy and response—the people, structures and relations that are in theory, and increasingly in practice, vested with the moral if not legal authority to minimize climate vulnerability and to improve human welfare at the urban scale: the city government.

NOTE

1. For the remainder of this chapter, 'Africa' will be used instead of 'sub-Saharan Africa'. The author is conscious of the serious problems and potential perils with generalizing for approximately 50 countries in the region and that the distinction between North Africa and sub-Saharan Africa has disciplinary and historic rationales that do not always hold merit. For this reason, the chapter tries to be generalize minimally and to use specific examples where possible.

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