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What role can African cities play in low-carbon development? A multilevel governance perspective of Ghana, Uganda and South Africa

Louise Tait[1*], Megan Euston-Brown[2]

1. Energy Research Centre, University of Cape Town, Private Bag, Rondebosch 7701, South Africa

2. Sustainable Energy Africa, The Green Building, 9B Bell Cres, Westlake, Cape Town 7945, South Africa.

Abstract

Cities' ability to mainstream climate goals into their activities is, to a large extent, influenced by the vertical divisions of responsibilities across different levels of government. This study examined how cities' agency to steer low-carbon urban development is enabled or constrained by multi-level governance arrangements in Jinja in Uganda, Ga East in Ghana, and Polokwane in South Africa. In both Uganda and Ghana, uneven progress with implementing decentralisation reforms greatly limited local government action, and there was poor alignment of sectors they could influence and those with significant emissions reduction potential. In Polokwane, however, a highly devolved governance structure afforded the municipality authority and autonomy over a much wider range of functions. Across all three cases, however, systemic capacity and resource constraints constrained the potential to develop proactive climate governance.

Keywords: *decentralisation, urban climate governance, climate change mitigation*

Highlights

- *In Uganda and Ghana, uneven progress with implementing decentralisation reforms greatly limits local government action.*
- *South Africa's highly devolved governance structure and supportive national frameworks support greater local governance of low-carbon development.*
- *Systemic capacity and resource constraints within municipalities suggest a more collaborative mode of climate governance is required in African cities.*

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* *Corresponding author: Tel: +27* 21 650 5931;
email: louise.tait@uct.ac.za

1. Introduction

Africa is experiencing a massive urbanisation trend and by 2050 almost two thirds of Africans will, it is predicted, live in cities (UN Habitat, 2010). This urbanisation demands attention not only because of its scale and pace, but also because it is taking place against a distinctly new set of environmental challenges at the urban scale. Much of the focus on climate governance in Africa has to date been on building adaptation and resilience (Kithiia and Dowling, 2010). It is, however, also necessary to interrogate urban development planning to prevent locking cities into carbon-intensive spatial forms and transportation modes for many decades to come.

Cities have emerged as important actors in the global landscape for climate change (Bulkely, 2010). As key sites of economic activity and emissions, they clearly play a central role as implementors of policy actions; but also, as many studies have found, in the design of policies (Corfee-Morlot et al, 2009; Bulkely and Betsill, 2006). The ability of cities to mainstream climate goals into their activities is, however, influenced by the divisions of responsibilities across different levels of government. In more centralised states, where cities lack substantial decision-making powers and financial resources, their ability to govern climate change mitigation is greatly constrained (Simon and Leck, 2015; Harker et al, 2016). The literature on multilevel climate governance in Africa, although growing, remains sparse, affording us limited insights into the role for African local governments to develop their own low-carbon visions and pathways (Diep et al, 2016).

This study examined the potential for African cities to shape low-carbon development pathways by exploring the multilevel governance arrangements in three countries. Specifically it sought to understand the extent to which formal institutional structures either enable or constrain the agency of municipal actors to proactively govern climate mitigation. Smaller municipalities were purposefully selected and included Ga East in Ghana, Jinja in Uganda and Polokwane in South Africa. The bulk of research and donor interest remains disproportionately focused on Africa's large primary cities (Simon and Leck, 2015), yet the majority of people live in smaller cities that will experience equally dramatic population growth in the future (Pieterse and Parnell, 2014).

2. Multilevel governance, decentralisation and urban climate governance

2.1 Multilevel governance in Africa

The concept of low-carbon development is broad and all-encompassing, cutting across most sectors and infrastructural decisions within a city. The question of how best to influence action is therefore complicated by the fact that decision-making will be dispersed across many actors, and action will necessitate a variety of collaborations and interactions across a range of scales (Simon and Leck, 2015; Bulkeley 2010; Madlener and Sunak, 2011). Any transition towards a lower-carbon development path is thus critically a question of governance. Governance refers to the ways in which different actors, public and private, identify, define and pursue collective goals (Betsill and Bulkeley, 2006; Diep et al, 2016).

Multilevel governance is a useful analytical lens that is increasingly being used to examine the types of interactions, both formal and informal, amongst different actors in relation to climate action at the local level (Bulkeley and Betsill, 2006; Hooghe and Marks, 2001; Harker et al, 2016; Corfee-Morlot et al, 2009). Multilevel governance, as conceptualised by Hooghe and Marks, refers to two 'types' or perspectives. The first, a 'vertical' perspective, aims to understand the 'negotiation of authority and competencies' across different levels of government, whilst the second, 'horizontal', approach focuses on multi-actor, networking relations, often focusing on specific governance functions. In the vertical approach, the formal and informal institutions that determine the scale of jurisdiction over climate relevant sectors are the analytical points of interrogation. It is critical to understand whether cities can set their own planning visions and objectives, whether they have regulatory and decision-making powers, and what financial resources and autonomy over their budgets they have.

Decentralisation refers to the downward transfer of political powers, administrative functions or fiscal resources (Paulais, 2012). Decentralisation experiences vary widely across Africa. In many countries, national governments have been ambivalent towards strengthening decentralised governments, and processes remain incomplete (Pieterse and Parnell, 2014). The barriers are often attributed to intergovernmental politics, a reluctance to transfer power that may undermine national interests, and capacity constraints at the local level (Diep et al, 2016; Bird et al, 2016). Capacity constraints are widespread across Africa: the structural adjustment years, mismanagement, rent seeking and corruption have all played a part in producing 'systemic dysfunctionality' in African local governments (Pieterse and Parnell, 2014).

Fiscal decentralisation, through central government transfers or empowering local government with revenue raising powers, remains the weakest aspect of decentralisation on the continent (Paulais, 2012). Countries in Africa transfer, on average, substantially lower proportions of national income to local governments than in other parts of the world (World Bank, 2001). Allocating responsibilities without the financial resources to fulfil them worsens distributional issues as well as governmental

performance (Diep et al, 2016). Even where there are significant fiscal transfers, local governments' autonomy over that spending is often limited by the conditionality of grants (Cities Alliance, 2013). Local governments' ability to raise their own revenue through rates and taxes thus becomes an important means to ensure greater autonomy and flexibility over spending decisions.

2.2 The role for cities in climate governance

Depending on the extent of their functional allocations, cities around the world have adopted varying modes of climate governance. One way is by acting as an 'implementer' of low-carbon projects and initiatives, using their spending power. This typically involves greening their own operations. Another mode is to incentivise action by other actors, such as businesses or communities. This can be done through awareness and education campaigns, or the design of infrastructure and public services, for example cycle lanes to encourage greater use of non-motorised transport. They can also act in their regulatory capacity to develop by-laws and legislation to induce behaviour change. An example may be developing by-laws for energy efficiency standards in buildings (Corfee-Morlot et al, 2009; Harker et al, 2016; Betsill and Bulkeley, 2006).

Typically cities tend to start by reducing emissions in their own operations, and acting as an 'enabler', supporting initiatives by other actors. As momentum grows, cities often expand towards regulation, provision of low-carbon infrastructure and more formal partnerships (Bulkeley, 2010). Different sectors have different opportunities for municipalities to drive low-carbon goals, depending on their responsibilities. Table 1 provides a list of generic municipal functions and their relevance to low-carbon development.

3. Analytical framework and methodology

The question of what drives municipal climate action, how innovations find traction and build

Table 1: Opportunities to integrate low carbon development into municipal functions

Functions	*Relevance to impacting sustainable energy/low carbon development*
Urban and land-use planning	There are strong linkages between urban design, spatial layouts and carbon intensity. Urban and spatial development plans can promote increased density and mixed use layouts to reduce tranport needs.
Transport planning	Provision of public transport facilities, infrastructural design and layout to influence travel behaviour and modes, for example bus lanes, cycle lanes, pavements.
Building control	Buildings are significant consumers of energy, both embodied and direct. Their energy performance can be improved through standards for construction and operational performance (e.g. thermal performance and resource usage).
Government housing delivery	Construction materials and design standards can greatly enhance energy performance of housing.
Street and traffic lighting	Retrofitting infrastructure with energy efficient street and traffic lighting technologies.
Facilities and social amenities	Municipalities often manage a wide range of public buildings including sports and recreation facilities, libraries, clinics, cultural facilities etc. Building energy performance standards can impact their energy consumption.
Energy generation and distribution	Energy generation, although seldom a local government function, provides emissions reduction potential through renewable energy generation, and demand side management. Distribution utilities may influence energy consumption through end-user demand management, load management and tariffs that incentivse more efficient electricity usage as well as facilitiating the uptake of distributed renewable energy generation.
Water supply	Energy-efficient management practices and efficient pumping technologies.
Sanitation and wastewater treatment	Energy efficiency in management and transport operations as well as potential to develop waste to energy generation.
Refuse collection (solid waste)	Municipalities can incentivise waste prevention, recycling and reuse through public awareness campaigns, providing recycling and composting services, as well as greening transport used for waste collection.
Environmental protection	This function can faciliotate low carbon and energy related regulations and initiatives. Air quality control can, for example, provide a powerful tool for limiting emissions.
Economic development	Stimulating development of the green economy through targeted economic and policy support measures.
Health and education	Construction standards (materials), and standards for operational performance (e.g. thermal performance and resource usage) can reduce consumption.

momentum, has garnered significant scholarly attention (Diep et al, 2016; Bulkeley and Betsill, 2013; Friend et al, 2014). There is no one 'model' of success, but is rather a complex and dynamic process requiring not only favourable structural environments, but also institutional champions, political support and technical capacity (Hodson and Marvin, 2010; Friend et al, 2014; Bulkely, 2010). Whilst the focus of this study is on the formal institutional environment, it is by no means the only variable of relevance.

This study employed a multiple case study research design to enable a deeper understanding of the situational complexity across a diversity of urban forms, energy systems and governance structures. Each of the cities were involved in the *Supporting African cities with sustainable energy transitions (SAMSET)* project (see http://samsetproject.net/). Data was collected from two main sources. Firstly, a desktop review was undertaken of national and local policies, municipal budgets as well as each city's 'state of energy' report that was compiled during the SAMSET project. Secondly, interviews were conducted with officials in each city to better understand enabling and constraining factors within the governance frameworks and institutions.

An analytical framework to guide the analysis was developed. The following three elements were considered.

1. The first analytical focus was on the extent of administrative and fiscal decentralisation and identifying the scales of jurisdiction over various sectors.
2. The second focus area was the role that national climate policy frameworks envisaged for local governments with respect to low-carbon development. The national level plays a crucial role in establishing priorities and frameworks from which other levels of government draw legitimacy for action and obtain financial resources.
3. The third focus was on identifying the sectors where cities have high influence (they have both authority and resources) that offer high emissions reduction potential.

4. Case studies of Ga East, Jinja and Polokwane

The three municipalities offered a diverse range of governance structures, levels of economic development and energy characteristics. Jinja and Polokwane, although very different in absolute size, had strikingly similar energy profiles, seen in Figure 2, dominated by their industrial sectors. This is somewhat unusual for African cities in general, where industrialisation tends to remain low, and most economic activity comes instead from service-based sectors (Madlener and Sunak, 2011). Ga East's energy profile stands in contrast to that of the other two cities. Economic activity was a much smaller

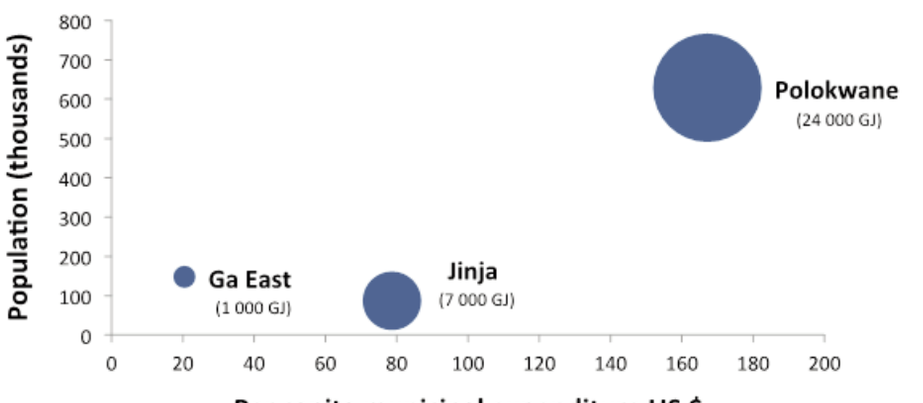

Figure 1: Comparison of population, municipal expenditure and energy systems (McCall, 2017; McCall et al, 2016; McCall and Stone, 2015)

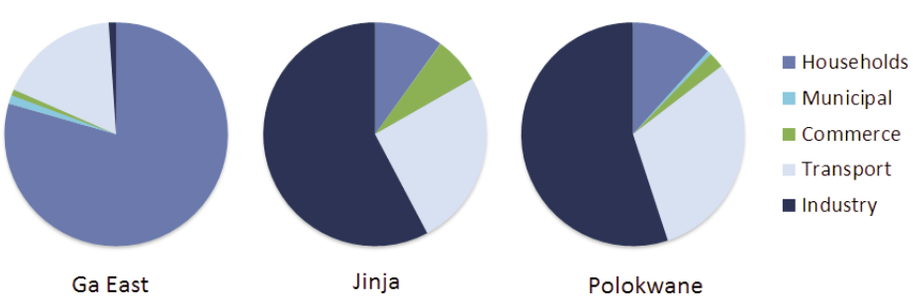

Figure 2: Composition of energy systems in the three municipalities 2016 (GJ) (McCall, 2017; McCall et al, 2016; McCall and Stone, 2015)

driver of energy demand here, where the household sector dominated the overall energy profile. As Ga East is located on Accra's periphery, this may be because many residents travel into central Accra daily for work. Each of the municipalities and their development characteristics are discussed further in the sections below.

4.1 Jinja, Uganda

Decentralisation in Uganda

Uganda is often described as one of the more progressive African states with respect to decentralisation (Okot-Okumu and Nyenje, 2011; Steiner, 2006). It has a supportive legislative framework favouring decentralised governance, giving districts such as Jinja substantial powers and autonomy. They can, in theory, devise their own development plans based on local priorities, make by-laws, manage their own budgets and raise their own revenue (Mugabi, 2004). Implementation of these decentralisation reforms has lagged, however, and various national level actions continue to limit the discretionary powers and autonomy of local governments (Tumushabe *et* al, 2013; Ojambo, 2012). Line ministries, for example, wield significant influence over policymaking and budget allocations and are often reluctant to reallocate powers, treating the local sphere more as executing agencies than autonomous decentralised entities (Tumushabe *et* al, 2013; Steiner, 2006; Cities Alliance, 2013).

The financial picture within Uganda's local government sector is constrained. Although empowered to raise local revenues through levies, taxes and other charges, most battle to do so. Poor administrative capacity is a major reason, but many critics point out that districts have only minor revenue-raising instruments under their control (Steiner, 2006). Consequently, they remain heavily reliant on national transfers, almost 85% of local government revenues are derived from inter-governmental transfers (Cities Alliance, 2013). In Jinja this is even higher, with transfers accounting for 96% of total revenue during the 2012/13 financial year (Asimo and Lusala, 2014). Most budgetary disbursements, distributed through the line ministries, are conditional, thus limiting discretionary spending by districts (Bird *et* al, 2016).

National climate policy and its vision for local government

Like the rest of Uganda's policy and governance frameworks, the National Climate Change Policy supports a decentralised mode of climate governance. It specifies roles for local governments in the planning, budgeting and implementing of low-carbon climate actions. It requires that climate change issues be mainstreamed into district development plans and that climate change focal points be established in the natural resource departments of district governments. This nationally set vision has not, as yet, filtered down to policy processes and discourses at local levels of government (Tumushabe *et* al, 2013; Bird *et* al, 2016). To date the only discernible mitigation activities undertaken by local districts have been small-scale tree planting in the natural resources sector, and some limited efficient cookstove projects (Tumushabe *et* al, 2013). Spending on climate change in Uganda overall remains low, far below the national target of 1.6% specified in the NCCP, with a disproportionate spending focus on adaptation measures (Bird *et* al, 2016).

Exploring opportunities for low-carbon development in Jinja

Jinja is one of the largest urban conglomerations in Uganda outside of Kampala. Previously a manufacturing and industrialisation hub in the 1950s and 1960s, most of its industry was lost during the 1960s and 1970s due to the expulsion of Asian entrepreneurs under Idi Amin's rule, nationalisation of industries and poor macro-economic policies (Ojambo, 2012). Today the economy is based more on agriculture, commercial and service activities although the remaining industrial sector still dominates the energy profile of the district, as seen in Figure 2. Transport is also a major energy demand sector (McCall, 2017). Located on several major transport routes, Jinja serves as an informal trading hub for agricultural and fishing goods, creating high inflows of daytime populations. The local area is still expected to continue to see substantial urbanisation going forward, but with insufficient planning capacity in Jinja's council, unplanned settlements sprawl outside the city centre. The population has more than doubled since 1990 (Asimo and Lusala, 2014). Households are the third biggest energy demand sector, predominantly stemming from the use of biomass energy sources. (McCall, 2017)

Jinja's council faces many of the challenges typical of local government in Uganda – inadequate financial resources, constrained autonomy and insufficient staff and technical skills. A review of their 2012/13 budget shows that around half of the budget went towards salaries and administrative expenses. The other half was dominated by a few sectors – roads and transport, health and education. Other functions, such as planning, agriculture and natural resource management received only minimal allocations. The environmental and natural resources division, the department earmarked to direct climate change actions, received just 0.6% (Asimo and Lusala, 2014). Although making environmental departments the institutional home for climate change is a common strategy, they are often under-resourced and politically weak (Corfee-Morlot *et* al, 2009).

Those sectors that Jinja can directly influence through either spending or regulating, and that also

have significant carbon reduction impacts are fairly limited. Although urban planning and building control could be one such sector, Jinja's planning department, with currently only one planner, is considerably under-resourced. Given current constraints, any expansion in activities would yield minimal concrete outcomes. They have some opportunity to green municipal operations, including retrofitting their municipal buildings and the various facilities they build (clinics and schools), greening the vehicle fleet, and improving the efficiency of solid waste management. The emissions reduction potential is fairly minimal, however. The council has few direct levers of control over significant energy-consuming sectors, such as industry or transport. For these sectors they would have to play more of an enabling or partnership role with stakeholders to encourage greener operations or switching transport modes. This mode of governance, however, is not without its own human resource and capacity requirements.

One opportunity for regulatory intervention lies in charcoal value chains. Charcoal is widely used in the household sector and is typically produced very inefficiently and then consumed using poor quality appliances. Interventions in both production and consumption present emissions reduction potential as well as improving access to quality energy services (MEMD, 2015). Jinja's natural resource department is empowered to develop by-laws relating to environmental protection, including forestry protection, enabling them to set regulations for more efficient charcoal production methods.

4.2 Ga East, Ghana

Decentralisation in Ghana

Ghana's decentralisation reforms, although continuing since the 1970s, have largely failed to meaningfully decentralise power and resources (Gilbert *et* al, 2013). It has possibly the weakest transfer of powers and resources of the three case study countries, and large discrepancies remain between constitutional and other legislative provisions for decentralisation and actual governance arrangements. Although metropolitan, municipal and district assemblies (MMDAs) have been granted a wide range of functions and responsibility over their own development, in practice their activities and autonomy are severely curtailed. Various national departments have supervisory powers over both development planning and budgeting processes (Gilbert *et* al, 2013). Another way in which power remains centralised is through the line ministries. Instead of transferring functions to the MMDAs, they tend to create deconcentrated entities at the local level that act as their administrative agencies (Gilbert et al, 2013; Cities Alliance, 2013). These deconcentrated agencies, as well as state utilities, intervene in the sectors of water, sanitation, electricity, health, education, and roads, leaving the districts only a marginal role there (Gilbert et al, 2013). Overlap between the roles of decentralised and deconcentrated departments also gives rise to confusion and tensions over responsibilities (Gilbert et al, 2013).

Although empowered to raise their own revenue from taxes, levies, rates and other charges, the ability of MMDAs to do so is often quite poor. Many remain heavily reliant on government transfers, which tend to be conditional, limiting local autonomy over spending decisions (Adu-Gyamfi, 2014). This can be further eroded when the deconcentrated agencies of ministries intervene and use funds for their own purposes (Gilbert et al, 2013). Another issue is that municipally raised revenues are often insufficient to cover their operational costs, and, with no national grant to cover these, transfers that are meant for capital investments and service delivery are often diverted towards these ends (Gilbert et al, 2013).

National climate policy and its vision for local government

Ghana has taken a proactive stance towards climate change, creating a substantial policy framework and mainstreaming both adaptation and mitigation into various national planning policies (Bird et al, 2016). Although low-carbon growth is prominent in the National Climate Change Policy (NCCP), the emphasis in action plans and budgets is overwhelmingly directed towards climate resilience rather than mitigation. The role envisaged for local government in the NCCP, unsuprisingly in the current centralised governance landscape, is minimal. Where present, their responsibilities are seen to be related to disaster risk reduction (Bird et al, 2016). The only area of mitigation where the NCCP specifies a role for MMDAs is in energy conservation in buildings, working together with central government and the private sector in this regard.

Exploring opportunities for low-carbon development in Ga East

The Ga East district assembly is situated on the ever-expanding peri-urban edge of Accra. Its population has grown rapidly in the past 30 years, much faster than in more centralised parts of Accra (Owusu, 2013). High land prices in the central city, together with low-density developments and weak land-use planning tools to stimulate inner-city densification are driving rampant urban sprawl on the outer edges of the city (Owusu, 2013). Still containing large areas of open land, Ga East's municipal area is expected to continue to experience high rates of inward migration going forward (Owusu, 2013). The peri-urbanisation of municipalities such as Ga East is largely characterised by low-density sprawling residential development. There is a high reliance on road transport. Many residents travel

daily to central Accra for work on heavily congested highways and endure very long travel-to-work times (McCall et al, 2015). Economic activity is concentrated in the commercial and service sectors, with high rates of informal economic activity, whilst the industrial and manufacturing base remains low. Not surprisingly, the emissions profile of Ga East is dominated by the household and transport sectors (McCall et al, 2015).

Ga East's decentralised functions include agriculture, social welfare, waste, roads and transport. The district assembly's autonomy in these sectors is often limited by the conditionality of the funding they receive. With many of their functions undertaken by other entities, and a limited budget, Ga East's overall expenditure is very low. Although the district raises a third of its budget from its own revenue sources, almost all of this goes towards salaries and administration (Ga East Municipal Assembly, 2015), leaving the district assembly with little investment expenditure from its own sources. Instead this comes entirely from national transfers, with their associated conditionalities. Most of their expenditure is directed towards constructing and maintaining facilities and social amenities (30% or 15%), health and education (7%) and road maintenance (7%). Approximately half of municipal expenditure is on salaries and administration expenses (Ga East Municipal Assembly, 2015).

Greening existing operations, often the starting point for municipal climate governance, provides limited opportunities for low-carbon interventions in Ga East, given the limited scope of their functions and low spending. These would lie in greening municipal solid waste operations, their office buildings and vehicle fleet as well as other public facilities they are responsible for. Like Jinja, many of the functions that provide the greatest mitigation potential, such as transport, lie outside of the Ga East's direct control and influence through either spending or regulation (Owusu, 2013). The sector and governance mode which may produce the most significant results would be to act as facilitator of action in the household sector, currently the most carbon-intensive demand sector: raising awareness, providing information and education about the issues and what resources citizens can access. To this end they can take advantage of the various low-carbon initiatives currently being undertaken by other actors, government and non-governmental, such as the efficient refrigerator-switching programme or efficient charcoal stove programmes (Wurtenberger et al, 2011).

One potential area of regulatory intervention that could be developed is around energy efficiency in buildings. Buildings are major energy consumers in Ghana, given inefficient building designs together with a sub-tropical climate that induces high demand for space-cooling and refrigeration. Whilst Ga East's current role in building control is predominantly as an issuer of building permits and compliance monitoring, this is the one major area for local government that has been identified in national climate policy and for which there are existing skills and processes within the municipality to build on. However, there are challenges with undertaking this function, for example corruption and lack of awareness amongst the public about building standards coupled with inadequate municipal resources to monitor and enforce national building standards. Efforts to introduce energy efficient designs and standards would be hindered by the same challenges without additional resource support.

4.3 Polokwane, South Africa

Decentralisation in South Africa

South Africa's democratic transition in the early 1990s saw substantial restructuring of the local government system. The new multi-level governance structure that was developed is highly decentralised, affording municipalities a great degree of autonomy in undertaking their administrative functions. These are broad and extend to water, electricity and local economic development. They are empowered to make their own by-laws (as long as these do not conflict with national or provincial legislation), develop their own development visions and manage and execute their own budgets. South Africa's fiscal decentralisation is also well developed. Under a national revenue-sharing agreement there is a wide range of national transfers to local government, including a substantial unconditional grant. Municipalities are also empowered to raise revenue through a variety of sources. They may levy various charges, fees and taxes and can also access to financial markets, although secondary and smaller municipalities generally lack the credit worthiness to do so. Some of the larger metropolitan governments raise almost two thirds of their revenue from own sources, whilst smaller and rural municipalities are almost entirely reliant on national transfers.

National policy provisions for local government in climate change

Nationally there is a strong emphasis on equitable, sustainable and low-carbon development. The National Climate Change Response policy (NCCRS, 2011) clearly specifies local government as an implementing partner and encourages municipalities to integrate climate change into municipal planning processes. However, the policy is unclear how municipalities will be empowered to implement the goals, noting that the mandates for local government to take on specific climate related activities are not always clear. Additionally, it notes that various fiscal instruments do not incentivise municipalities to mainstream climate compatible development. Although several line ministries delegate specific

projects and budgets for mitigation activities, many of these are ad hoc and, as yet, there are no budget allocations for nation-wide municipal rollouts.

Opportunities for low carbon development at the local level

Polokwane is a significant economic centre in the north-eastern part of South Africa. Located in South Africa's platinum belt, its energy profile is dominated by two large smelters as well as several other large industrial and manufacturing businesses (McCall and Stone, 2017). It stands out among the case study municipalities for its much larger industrial base and higher levels of formal economic activity. Despite this, there remain stark developmental challenges, with many residents still excluded from its economic progress (Lethoko, 2016).

Polokwane's previously strong population growth has been slowing in recent years, but the household growth rate has remained high (Statistics South Africa, 2011). This has significant implications for demand for household services as well as an ever-expanding physical footprint of the built environment. Polokwane's spatial layout is dispersed and low-density, greatly increasing the demand for transport services. The majority of citizens walk, with private vehicles moving only a third of commuters yet accounting for more than 80% of passenger related fuel consumption (McCall and Stone, 2015). The industry and transport sectors dominate the energy profile of the city (McCall and Stone, 2015).

A much wider range of functions sit within Polokwane's sphere of influence than the other two cases, reflecting South Africa's more substantial progress in implementing their decentralisation reforms. Municipalities have far-reaching responsibilities that include waste, sanitation, electricity, air quality management, public transport and economic development. Many of their functions converge with sectors and activities that could steer low-carbon development. Whilst Polokwane is relatively better resourced and capacitated than the other two case studies, it is worth noting that the municipality is not without its own institutional challenges. A shortage of skills, deteriorating city finances, corruption and large backlogs in infrastructure maintenance are just some of the challenges it faces (SACN, 2014).

The municipality undertakes an extensive range of activities, suggesting that greening its operations could yield significant energy savings. It has already undertaken some initiatives in this regard, for example energy efficient retrofitting of traffic and street lighting, as well as water pumping and sanitation systems. This was enabled by national funding allocations for this purpose. Public transport is also a municipal function and the municipality is developing a bus rapid transport system.

Spending on infrastructure is a major portion of its budget activities, over which it enjoys significant autonomy. In theory this opens up a wide range of opportunities for low-carbon infrastructure development. There are, however, critical constraints in this regard. The first is that many of the municipality's infrastructure assets are ageing and poorly maintained, with a huge maintenance spending backlog (SACN, 2014). This crisis in infrastructure management, coupled with various developmental imperatives relating to universal access and subsidisation for the poor, makes it difficult politically to prioritise low-carbon development spending. Secondly, there are unresolved institutional disincentives related to certain low-carbon activities. Promoting small-scale embedded generation is one example. User charges on electricity are the primary revenue source for the municipality and any reduction in sales through renewable energy would have negative financial implications for the municipality if not well managed (SACN, 2014).

The municipality also has the potential to use various regulatory levers and develop by-laws relating to air quality, energy efficiency standards for buildings, or standards for small-scale embedded generation of renewable energy technologies. South African municipalities are fairly unique in the African context in that electricity distribution is a local-level function, giving them a central role in facilitating the integration of distributed renewable energy technologies into the grid. To date, despite a promising range of low-carbon municipal initiatives, these are often ad-hoc rather than programmatic, and are seldom initiated due to their climate benefits. The programme retrofitting street and traffic lighting, for example, was initiated by the National Treasury for energy security rather than emissions reduction objectives. Further, the municipality has not yet incorporated climate mitigation (or adaptation) into its formal development planning processes (Lethoko, 2016). There is still a need for institutionalisation at the local level, such that low carbon development is a core part of municipal functions rather than an add-on.

5. Discussion and policy implications for an African agenda

The preceding case studies demonstrate how significantly mandates and budgets influence the ability of local governments to steer low-carbon development. The uneven progress with implementing decentralisation reforms in Uganda and Ghana greatly limit the types of interventions those municipalities can consider. Both these countries illustrate an all-too-common tendency amongst many African states to retain power and resources at the centre. Local governments effectively serve as implementing agencies, with limited autonomy. The merits or otherwise of these centralising tendencies

are not the subject of this paper and we do not try to argue that more decentralisation is necessarily the answer to realising broader climate goals. The dynamics of multilevel governance are complex, particularly in the face of pervasive capacity and resource constraints that both face. Further devolution without empowering and capacitating local governments to take on those responsibilities will not improve governance and developmental outcomes.

The potential for Polokwane to meaningfully engage with climate mitigation goals is markedly different. Here a highly devolved governance structure affords the municipality a wide range of functions over which it enjoys a substantial degree of autonomy. The city's activities are also situated within a substantially more enabling national climate policy environment – although implementation of these policies is still somewhat limited at this stage. There remain various institutional challenges, including institutional disincentives towards low-carbon investments and declining trends in many key operational performance indicators, for example financial management (SACN, 2014)

Whilst mainstreaming is an important strategy for building municipal climate action, this study's findings raise the question of its primacy in states where systems and processes are themselves either grossly inefficient or absent (Friend et al, 2014; Newell and Bulkeley, 2016; Kithiia, 2011). Across Africa, many local governments barely manage to maintain their existing systems, infrastructure is often in a state of disrepair, and services do not reach all citizens. Local government's success to date in proactively managing their urban development, through master planning, infrastructure development or building control has been extremely poor (Oosterveer, 2009). Friend et al's (2014:7) comment in relation to mainstreaming climate policy in Asian cities, is relevant to this context as well: 'In many cases there is such a fundamental governance gulf that what is required is a transformation rather than simply mainstreaming, and that the discourse and practice of mainstreaming merely reinforces existing hierarchies, knowledge and power.'

Given the context of weak institutions, and a state that is unlikely to be able to play a strong interventionist role, how should we be conceptualising African urban climate governance? Two things are important. First, any efforts to mainstream need to take place within a field of interventions that include building political support, capacity building and financing. Secondly, the analysis points to the relevance of building a more collaborative mode of governance that engages multiple actors rather than relying solely on the state to intervene (Oosterveer, 2009). This suggests that municipalities focus on engaging and building partnerships with multiple stakeholders across a range of levels, both inside and outside government, rather than solely on their role as the primary implementing actor.

6. Conclusion

This study sought to better understand the extent to which formal multilevel governance arrangements either enable or constrain the ability of African municipalities to proactively engage with low carbon development goals. There were a wide range of experiences across the three municipalities studied. In those countries with fairly centralised modes of governance, such as Ghana and Uganda, the analysis of functional mandates and budgetary resources showed limited ability to impact the sectors that would provide significant carbon reductions.

An empowered local government, with the competencies, financial resources and political will to drive local action, is essential. Even if favourable institutional frameworks exist, pervasive institutional weakness begs the question of whether a more active developmental role can be assigned to African states. To this end, the study acknowledges that whilst favourable institutional structures are indeed essential, they are unlikely to drive action whilst the local government sector still faces skills and resource constraints, among other challenges. Instead, developing low-carbon pathways will necessitate a networked mode of governance, and necessitate multiple collaborations across different scales as well as with various actors outside of the government sphere.

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