Chapter 9
Multi-level Governance, Resilience to Flood Risks and Coproduction in Urban Africa

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Abstract This chapter examines how climate change adaptation becomes integrated as a policy field within multi-level governance in the two coastal cities of Dar es Salaam, Tanzania and Saint Louis, Senegal. We explore the ways in which this policy sector works towards *resilient cities* as it interfaces with the governance of flood risks.

In Dar es Salaam, we find that adaptation and flood risk management have no substantive organisational home at municipal level. These policy fields are not well integrated into the city's land use planning and development at a local level. Public officials, to a limited degree, encourage citizen participation in flood risk management and land use planning. In Saint Louis, public officials, especially municipal planners, actively encourage citizen participation in flood risk management and local development planning. We suggest that it is not the size and adaptive capacity of the municipality, *per se*, that matter for the integration and functioning of climate risk management at local level. Rather, it is the way multi-level governance enables or constrains the ability of public officials to enhance the responsiveness of citizens and their input into the coproduction of services and water resources management. The chapter refers to theories of coproduction within multi-level governance to explain drivers and barriers to adaptation and resilience.

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Introduction

Cities are increasingly acknowledged as important strategic actors and places for governing climate risks and enhancing resilience (Betsill and Bulkeley 2007). Many cities do take a high degree of leadership in preparing adaptation programmes and protection against flood risks even in the absence of guidance from national policies and enabling frameworks. The concept of *resilient cities* has, to this end, been widely promoted as a desirable goal within the policy context of climate change (UN-Habitat 2011; UNISDR 2012, 2014; Satterthwaite and Dodman 2013). Consequently, many observers claim that it is the city government that needs to bring coherence to agendas that have previously been addressed in uncoordinated manners, e.g. climate change adaptation, disaster risk management and sustainable urban development (Satterthwaite et al. 2007, 2009; Satterthwaite 2011; Pelling 2011; Bulkeley 2010, 2013; O'Brien 2012; Satterthwaite and Dodman 2013).

It is also widely recognised, however, that many cities in both developing countries and developed countries are confronted by important barriers to the integration and institutionalisation of the climate risk agenda that require better understanding (Bulkeley 2013; Hanssen et al. 2013; Roberts and O'Donoghue 2013). Municipal authorities' capacity to act on adaptation is often severely constrained by multi-level governance that restricts mandates and resources at city, sub-city and local/community levels (Satterthwaite 2011; Vedeld et al. 2012; Satterthwaite and Dodman 2013).

This study is designed as a comparative analysis of how urban flood risk management is integrated in multi-level governance within two cities – in one larger city and one smaller city – as it interfaces with the climate change adaptation agenda. Flood risks are considered as local manifestations of (extreme) climate risks and extreme weather (Douglas et al. 2009).

Several observers in this regard suggest that larger municipalities will have greater capacity and an advantage in integrating adaptation in governance compared to smaller ones (Rauken et al. 2014). Analysing the two city cases from a perspective of multi-level governance, we put forward a different hypothesis, however. We argue that it is not the size and scale of the municipality which is decisive for the functioning of local climate risk management. Rather, it is the way the arrangement of coproduction operates within the system of multi-level governance that best explains difference in approaches. Coproduction is defined as "the process through which inputs used to produce a good or service are contributed by individuals who are not 'in' the same organisation" (Ostrom 1996: 86).

We gave priority to analysis of the vertical steering and policy integration issues within and across key climate risk-relevant sectors, and how coordination and cooperation is enabled at two local levels; (i) municipal level (city and sub-city level); and (ii) local community level. The focus on the local level is motivated by the fact that climate change will impact differently across urban neighbourhoods. This means that a significant share of climate risk governance needs to take place at the local level and,

thus, be analysed at this level, i.e. as close as possible to the scene of events of those that are potentially impacted and need to act upon or manage an extreme risk.

So far, considerable research on urban vulnerability and climate change adaptation in developing countries has been undertaken (Adger et al. 2009; Ziervogel and Parnell 2012; Carmin et al. 2012; Satterthwaite and Dodman 2013; Roberts and O'Donoghue 2013). However, less research has been done on institutional drivers and barriers to establishing a resilient city – especially in Africa – and its relation to governance at different levels and scales (Vedeld et al. 2012). Research on this topic is also limited for comparative city cases across socio-political and climatic settings (Kern and Alber 2009; Bulkeley 2013; Hanssen et al. 2013). Our study contributes to this debate and builds upon earlier research from the growing international literature on climate change, adaptation, and urban governance (Betsill and Bulkeley 2007; OECD 2009; Bicknell et al. 2009; Pelling 2011; Cartwright et al. 2012; Hanssen et al. 2013; Bulkeley 2013; Satterthwaite and Dodman 2013; ICLEI 2014).

Analytical Framework

The integration of adaptation into government and governance across levels and scales is considered critical to long term climate resilience (Bulkeley 2013). The focus on resilience and *resilient cities* is of relevance to all urban settings and concerns "capacities to withstand or recover from all direct and indirect impacts of climate change" (Pelling 2011; Satterthwaite and Dodman 2013: 292). Resilience can be defined more precisely as:

> The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions. (IPCC 2012: 3)

The resilience discourse within the climate adaptation literature is allied with contemporary governmental and governance discourses about the sharing of responsibilities between state and non-state actors for risk management, and conditions for innovation and change towards a new, more sustainable system state. This inherently normative stand relates to discussions about transitional adaptation and transformation (Pelling 2011). Resilient cities in this chapter is operationalised with inspiration from the *Ten Essentials for Making Cities Resilient* (UNISDR 2014); e.g. existence of organisation and coordination mechanisms to reduce risks in responsive manners; budget for (flood) risk management; risk and vulnerability assessments; early warning systems and emergency management capacities; critical stormwater infrastructure (to address underlying vulnerability); land use principles in place and enforced; climate-action strategy in place; and sound environmental management.

Consequently, we bring together theories from (i) multi-level governance, (ii) coproduction (and related network governance theory), and (iii) resilient cities. The governance analysis explains the interplay between actors, levels and sectors of

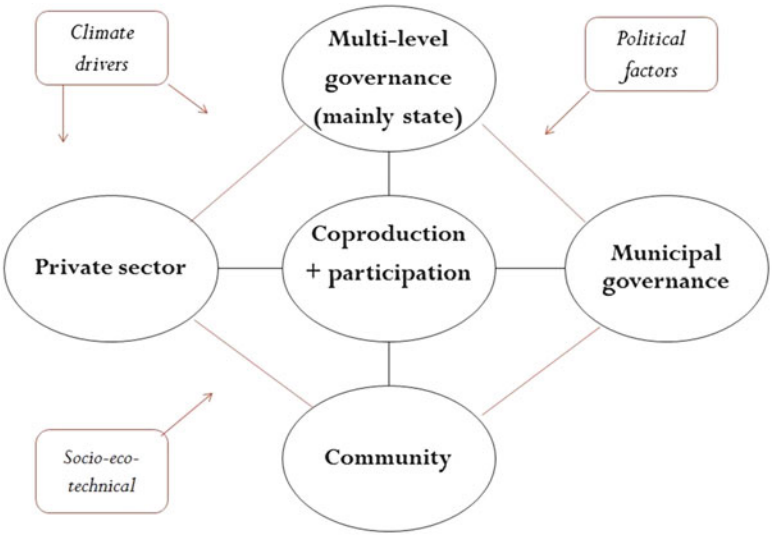

Fig. 9.1 Multi-level governance and coproduction (Authors' own design; inspired by Ostrom 1996 and Bulkeley 2013)

government in addressing complex public policy challenges related to climate risk management – as a *wicked problem* (Bache and Flinders 2004; Betsill and Bulkeley 2007; Weber and Khademian 2008; Peters 2008; Sorensen and Torfing 2009; Osborne 2010; Bulkeley 2013; Sorensen and Torfing 2014). The analysis of coproduction within multi-level governance focuses particularly on the encounters at the interface between public officials and citizen groups (or private sector) related to forms of collaboration (engagement/disengagement) and forms and degrees of participation in service delivery and possible coproduction in flood risk management (Ostrom 1996, 2005; Bulkeley 2013). Figure 9.1 suggests the institutional focus of the analysis. Multi-level governance, which is typically state and hierarchy dominated, constrains the capacity for municipal governance (through processes of decentralisation, deconcentration and delegation), including through the enabling of the private sector and community (see below) (Betsill and Bulkeley 2007). Municipal governance typically involves four modes of governance: self-governance, provisioning, regulation, and enabling (Bulkeley 2013).

Methodology

The research focus led to a case study approach with a mix of research methods; policy and planning reviews, institutional analysis, in-depth interviews (planners, officials), focus group interviews with citizens, local observations of floods and transect walks, and validation workshops and meetings with local officials, civil

society and academia. Altogether we conducted 49 semi-structured interviews in the two cities, allowing for a variety of topics to be addressed. Each interview lasted about 1.5–2 h, and was conducted mostly in the office of the interviewee by a lead interviewer and 2–3 team members.

We first explored which institutions and policy sectors were involved and relevant for "climate adaptation policies at city and community levels" which is our main research "case". Given the "triple" governance challenges faced by the municipality in both cities of (i) planning new settlements for a rapidly increasing population; (ii) meeting existing gaps in providing quality service delivery and infrastructure for all citizens and addressing underlying vulnerabilities, and (iii) addressing "new" or future climate risks such as floods, the empirical data collection focused on the integration of climate risks/adaptation in three key sectors and related actors/agencies: (i) urban planning (strategic, land use and development planning); (ii) water resources management (flood risk and storm water management, sewerage, water supply); and (iii) disaster risk management. In concrete terms, we looked for actions considered critical to promote resilience at the level of the local communities, including, *inter alia*: whether or not climate action plans had been established through participatory approaches; institutional homes and mandates for understanding and addressing key issues; functioning coordination mechanisms; assigned staff, budgets and resources; planning and zoning principles that were enforced and respected; and whether or not broader underlying vulnerabilities were addressed in ways responsive to community-based demands and needs for adaptation and coproduction (ref. the criteria identified in the *Ten Essentials for Making Cities Resilient*, UNISDR 2014).

We considered both incremental adaptation measures that mirror resilience more narrowly defined, while also determining if there was evidence of transitional adaptation or transformation, with reference to the second and third "levels of adaptation" as recognised by Pelling (2011). Transitional adaptation, according to Pelling, involves changes in governance; while transformation requires more radical or deeper changes in political and cultural values and structures. For our purpose the cities and urban communities then needed to be assessed with regard to two key dimensions; resilience and the capacity to act and deliberately change or adjust urban development through different forms of adaptation at different levels. A wide range of complementary adaptation and disaster risk management approaches are available to enhance resilience to flood risks, including: to reduce risk and exposure; reduce vulnerability; share risks; and prepare, respond and recover from floods (IPCC 2012).

We carried out field-work in two case study locations in each city in order to understand how sub-city levels of governance operate and how local community groups are enabled or constrained in climate change adaptation and (flood) risk management, particularly in encounters with government officials and agencies. The two locations were chosen as informal settlements that are highly exposed and vulnerable to different kinds of floods, with a known history of engagement in flood risk management at the level of the community and Sub Wards. The areas included 8,000–12,000 people. In Dar es Salaam, the two settlements were both

located within Kinondoni Municipality. Bonde la Mpunga is an informal, underserviced and unplanned settlement and Sub Ward close to the coast and subject to flash flood and floods from smaller rivers due to inadequate drainage. Suna is located further inland and is exposed to both severe river flooding and stagnant water, as it is located in a river valley bottom. We utilised Bonde la Mpunga as the main case. In Saint Louis, Diaminar is a low-lying area and Sub Ward that is also exposed to flash floods due to inadequate drainage, similar to Bonde la Mpunga. It is also affected by salinisation of housing from sea water intrusion. The second case, Goxxumbacc is exposed both to coastal flooding and flash floods, while in the past it was also subject to floods from the River Senegal. Diaminar is utilised as the main case for comparison. The four cases illustrate different kinds of flood risks observed, and how these engage different kinds of responses, interactional relationships, and variation in public agency responses.

Drivers and Barriers

We utilised a multi-level governance framework to systematically analyse and compare the integration of climate adaptation policies and flood risk management across sectors, actors and levels (Fig. 9.1) (Osborne 2010; Pelling 2011; Bulkeley 2013). The extent to which different modes of governance are actually deployed at different levels and have been successful are the result of different factors that act as both drivers and barriers to the cooperation or coproduction of knowledge and action between state, municipal and non-state actors. We distinguished three sets of factors; *institutional*, *political* and *socio-technical* (Bulkeley 2013), in addition to climate drivers (Fig. 9.1).

Institutional factors in our study are those that shape the capacity of urban institutions at all levels – both formal and informal – to respond, withstand or improve systems' resilience. The main institutional factors and actors and related interactional processes are captured in the circles of Fig. 9.1. Our key focus is on institutional factors related to the *multi-level governance* context within which urban adaptive capacity is enabled and capacity to act and respond to climate risks at local levels largely determined. The institutional factors are conditioned by political factors, socio-technical factors and climate drivers. From an adaptation perspective, we need to understand who and what need to become more resilient; i.e. individual citizens and their assets in local settlements that are exposed and vulnerable to floods. They need support from resilient services and governance systems.

Regarding the *state level* and state-municipal interactions within the broader institutional arrangements, we investigated how the state, at national and regional levels, works through different governance modes in vertical (and horizontal) coordination in the selected sectors to balance powers and resources and enable or constrain the adaptation of city and sub-city level actors. This concerns processes related to (Vedeld 2003; Peters 2008; Manor 2011): (i) Decentralisation and

devolution of key functions and resources of the public sector; (ii) Delegation of public authority to e.g. civil society or private market actors; and, (iii) Deconcentration of public authority and tasks to regional state bodies or to a variety of (semi-) autonomous corporations or agencies (e.g. in water supply or sewerage provisioning).

In both cities, the state engages directly within the urban territory, in e.g. land management, service provision and infrastructure. In this regard, we are also interested in how the state makes available powers, mandates, and *financial and other resources* for the municipality.

At the *municipal level*, we analysed organisational arrangements and operations of the municipality in relation to different ideal modes of municipal governance. These modes of governance relate to a specific set of processes and techniques that municipal authorities deploy and related resources and knowledge. Bulkeley distinguishes between four modes of municipal-led governance; municipal self-governing, provisioning (by the municipality itself of services and infrastructure), regulation (through hierarchical steering and control), and enabling (for detailed explanation cf. Kern and Alber 2009; Bulkeley 2013). We focus mostly on the capability of the municipality for enabling, i.e. capacity to facilitate, coordinate and encourage actions of non-state actors through coproduction or forms of networks, partnerships or mobilisation (Ostrom 1996; Sorensen and Torfing 2014).

At *community, neighbourhood or sub-city levels*, civil society actors or private business may interact and condition municipal actions from above and from below, or engage in non-state voluntary or community self-regulation modes of governance (De Sardan 2011).

Political factors are also important, although not central to our analysis. Political factors relate to the attention to adaptation (risks and vulnerabilities) given by the political leadership at different levels (e.g. municipal councillors) within the political-economic context. It also relates to the role of specific economic and political interests and actors that shape resilience and urban development locally (Bulkeley 2013: 102).

Socio-ecological or socio-technical factors relate to the ecosystem context, social and demographic conditions, including urbanisation trends and forms and settlement patterns (e.g. in flood-exposed areas), and urban landscapes and morphologies (Ostrom 2005; Bulkeley 2013; see also Chaps. 4 and 6).

Criteria for Choice of the Cities

As a consequence of the research focus on how adaptation becomes integrated in multi-level governance and drivers/barriers to resilient cities in relation to flood risks, we selected one larger (Dar es Salaam) and one smaller city (Saint Louis) faced with fairly similar types of flood risks. The cities were situated in similar eco-system contexts (coastal/river delta) and conditioned by broadly similar governance challenges. In particular, we wanted to explore the importance of size

Table 9.1 Size, vulnerability and climate drivers in the case study cities

	Dar es Salaam	Saint Louis	Comments
Demography and area			
Population size (2012)	4,000,000	200,000	Dar es Salaam much larger
Population density	1,500 citizens per km^2	5,000 citizens per km^2	Higher density in Saint Louis
Size of urban territory	1,590 km^2	40 km^2	Dar es Salaam much larger
Underlying vulnerability			
Rate of population growth	4.4 %	2.4 %	Urbanisation is fastest in Dar and promotes informality and settlement in flood-risk areas
Share of population in informal areas	80 %	29 %	"Informal areas" not defined fully the same way
Access to critical services – % of total urban population			
Access to piped water	25 %	97 %	Indicates much better water supply services in Saint Louis
Access to sewerage	11 %	15 %	
Reliance on pit latrines	92 %	90 %	
Exposure; geo-physical pattern			
Exposure of people, places, assets – percentage of territory flood exposed	8 % of territory below 10 m above sea level	All of city territory below 4 m above s.l.	Dar has a low-lying coastal strip; Saint Louis is all low-lying
Climate drivers and exposure			
Annual rainfall	1,100 mm	300 mm	Heavy cloudbursts common
Flood risk types	River, flash floods, coastal	Flash floods, coastal	Flood risk from River Senegal lowered due to new canal made in 2003
Climate/flood risk projections	No major change in rainfall	More extremes expected	Flood risk expected to increase in both cities due to changes in social conditions more than change in rainfall

and scale for urban flood risk governance. The two cities were chosen as two coastal cities among the five cities studied under CLUVA (see also Chap. 1 and Table 9.1).[1] Both are former capital cities and regional economic centres with several similarities in institutional structures and presence of most of the sector agencies relevant for addressing flood risks. As such, the two cities represent institutionally "rich" case studies and are interesting for our comparison. Selecting two cases that vary in terms of past experiences of extreme flood events, size and adaptive capacity, political factors, and multi-level governance (structures and processes) enabled us to compare and analyse the implications of governance for coproduction,

[1] The five cities being researched under CLUVA are Addis Ababa, Dar es Salaam, Douala, Ouagadougou, and Saint Louis (CLUVA 2014a, b).

coordination and integration of adaptation strategies in the municipalities' and local communities' approaches to urban development.

Some obvious differences between the two municipalities complicated a rigid comparison, however. For example, the two cities faced rather different rates of population growth, and also quite different rates of urbanisation and risk exposure and vulnerabilities. Saint Louis is faced with greater magnitude and frequency of extreme flood events. Moreover, the climate scenarios for Saint Louis suggest changes towards greater climate variability than those for Dar es Salaam (see Chap. 2 and CLUVA 2014a, b). The two cities are also located in rather different cultural and institutional settings; one in Francophone West Africa and one in Anglophone East Africa. Moreover, while Senegal was among the pioneers in introducing democratic elections and a multi-party system in the 1970s, and decentralisation in the mid-1990s, Tanzania introduced a multi-party system only in 1992, and politics are still dominated by one main socialist party (CCM).

The precise criteria chosen for the comparison of the two cities were the following. First, the most important institutional factors to be compared related to the multi-level governance context within which the actual capacity for urban response and action to climate change and flood risks evolve. We assumed that the vertical relationships of government and governance were critical for framing the relationships between local actors, e.g. determining the responsibilities and powers of the municipality in different sectors, and enabling or constraining coproduction between different government, civic and private actors (UN-Habitat 2011; Bulkeley 2013). From the outset we assumed (based on existing literature) that the city of Dar es Salaam was likely to be less resilient compared to Saint Louis (Diagne 2007; Ndour 2010; Coly et al. 2011b; Vedeld et al. 2012; Kiunsi 2013). However, while this assumption proved correct, we also made this an object of our investigation and comparative analysis.

Second, size and scale of a city and the capacity of the municipality to adapt have been considered important factors by some observers for the choice of adaptation approaches (Rauken et al. 2014). The argument is that a large municipality will typically have more resources and capacity for specialisation and allocation of resources to a new policy domain such as adaptation (Rauken et al. 2014). Our approach included a test of this hypothesis.

Third, both cities have recently experienced severe floods and related extreme weather events. In this regard, new knowledge and awareness about climate change and its risks and also experiences of extreme impacts were considered a potentially important driver for explaining urban municipal responses.

Finally, we also considered the degree to which political factors appeared to influence the framing of climate policies at city level, and thus, approaches to adaptation among planners and other actors.

Both cases contributed to an understanding of how adaptation is established (or not) through coproduction in multi-level governance in cities in coastal Africa operating under *extreme financial constraints and relatively centralised hierarchical steering*. Salient features about the size, scale, socio-economic vulnerability and climate exposure of the two cities are provided in Table 9.1.

Findings from the Case Study Cities

The presentation of the findings from the research is organised as follows; first, we present a comparative analysis of the multi-level governance structure in both cities as reflected in the vertical state-municipal relationships, indicating similarities and differences in structures and capacity for coordination of the different levels. Second, we present each of the city cases, initially through a brief background, and subsequently, through a detailed presentation of the municipal organisational structure and the municipality's capacity to operate within the key sectors of concern (planning, adaptation, disaster risk management, and water resources management). Finally, we analyse the (vertical) interactional relationships between public officials (state and municipal) and community level actors and institutions in relation to coproduction of relevant flood risk responses and services at the local level.

Multi-level Governance Structure – Centralised and Hierarchical Government

The multi-level governance structure critically constrains the capability of each of the municipalities for autonomous self-governing and provisioning of key public services and infrastructure. The degree and form of centralisation keeps the municipalities from accessing important mandates, powers and financial resources. Key state ministries and agencies in both countries are interventionist in their dealing with the municipality related to urban planning and development functions. This concerns ministries dealing with functions such as urban planning, adaptation/environment, disaster risk management and local administration.

Both countries basically have a three-tier government structure characterised by a relatively strong unitary state, a relatively autonomous, yet weak, municipal level, and an even weaker regional elected level (with elected regional councils). Dar es Salaam city is located within the region of Dar es Salaam, while Saint Louis is similarly located within the region of Saint Louis.

The regional elected councils in both countries are weak in terms of administrative capacity and resources for coordinating services and development. Most importantly, the regional state level, as well as the district state level, represents the 'strong' levels in terms of oversight and coordination and the provision of key relevant services related to land use planning and control, water infrastructure, flood risk management, and resettlement of flood victims. The deconcentrated state services at this level, considered part and parcel of the decentralisation reform, are in both cities located 'next-door' to the municipal services and to some degree overlap and integrate with those of the municipality in local operations.

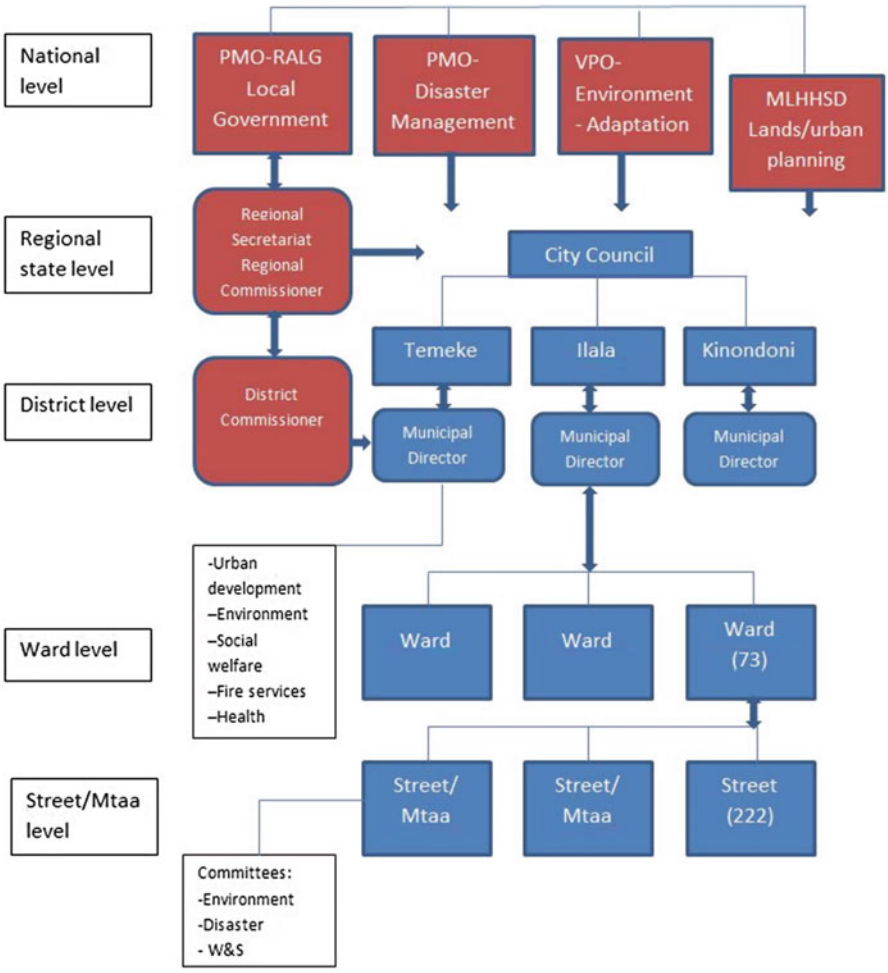

Fig. 9.2 The organisational structure of Kinondoni Municipality and Dar es Salaam City Council (*blue*) and key state agencies (*red*) engaged in urban development (abbreviations explained in the text)

The state services are largely coordinated by the Governor at regional level and Prefect at district level in Saint Louis, and, similarly, by the Regional Commissioner and Regional Secretariat at regional level and the District Commissioner at district level in Dar es Salaam. The Prefect and District Commission are on par with the Mayors in the authority hierarchy (see Figs. 9.2 and 9.4).

The regional state agencies thus play the key role in coordination with important implications for adaptation and disaster risk management services within the city territory. Only Saint Louis has a Climate Advisor in the city planning office and this office enhances municipal governance on these issues. Coordination in flood risk management is mainly done by the Governor/Regional Commissioner at regional

level and by the Prefect/District Commissioner at city level. The coordinating committees at this level tend to function through hierarchical instruments, for example, by providing information and guidance in environment and/or disaster risk management committees, while also instructing service agencies on what to do in general development (development committees). The regional and national level state coordinating committees for adaptation and disaster risk management have limited administrative, technical and financial capacity to actually perform their duties within the city territory. Also, important semi-state and private corporations are involved in sewerage and water supply in both cities. But they are mandated to work mostly in formal areas and, thus, in middle-class neighbourhoods and the city centres.

While the municipality in each city has some degree of autonomy, and is supposed to be overseen by the regional state level only in their legal handling of budgets and functions, in reality this autonomy is lacking in the sense that the city has very limited powers and legal mandates, finances, staff, and technical competence. This undermines their capacity to perform their planning and service functions, including in climate risk management.

Dar es Salaam – Short Background

Dar es Salaam is the largest city and the main economic centre of Tanzania. The city has experienced a series of floods arising from smaller rivers and lack of drainage as well as coastal flooding over the last few years (Ardhi 2011). In 2011, flash floods after heavy rains killed over 40 people and displaced thousands of people and destroyed houses and assets across the city. CLUVA's analysis of extreme rainfall events, based on climate projected data until 2050, suggests an increase in the frequency of extreme events, but reduction in intensity and limited increase in rainfall (Chap. 2). Flood impacts will increase, however, but mainly due to likely increased concentration of people in flood prone areas (CLUVA 2014a).

It has been in the context of these different climate change risks, while being confronted with the multiple challenges of providing development to a rising population, that the urban authorities have started to respond to climate change adaptation and flood risks more systematically. We exemplify these issues through the two local case studies; Bonde la Mpunga (our main case) and Suna.

Multi-level Governance and Barriers to Municipal Adaptive Capacity

The municipality of Kinondoni is responsible for a rather limited set of services, including development planning, strategic planning, fire services, solid waste collection, health/education, social welfare, and environmental management. Hence, it lacks critical capacity for self-governing and provisioning, as well as in

enabling coordination. The lack of institutional capacity is illustrated by the lack of financial and other resources for operations. The overall annual budget for the municipality represents only about 31 Euro per capita. Adaptation and disaster risk management have no allocated budget (beyond the general budget for fire and rescue services). The budget at Sub Ward levels is only about 1–2 Euro per capita per year and covers only minor running costs of a small office (PMO-RALG 2012). A local planner confirmed that the "finance was very limited" for the list of priority development activities prepared by the Sub Wards (Interview MLHHSD planner on 4th June 2012). Key urban development programs are mostly funded directly by central government agencies, public enterprises or by external partners (donors).

Municipal Government Structure

Beyond the constraints set by the state and multi-level governance, the organisational structure of Dar es Salaam City Municipality is complex and multi-layered with clear structural deficiencies in terms of vertical coordination and horizontal communication. The municipality is composed of a four-layered structure (Fig. 9.2), headed by the City Council (DCC). It is sub-divided into three autonomous municipal councils; Kinondoni (531 km^2), Ilala (210 km^2) and Temeke (652 km^2). The Kinondoni Municipality, which is the focus of our study, includes close to 50 % of the city population and most of its high-income residential areas. Each municipality is divided into Wards (total 73 Wards) and Sub Wards or street level (222 Mtaas), for further explanation of organisation of the Mtaas, see Chap. 6. However, the three municipalities tend to govern with limited regard for the City Council. On many accounts they act as if they are more accountable upwards to some of the state ministries which are heavily involved in the strategic and daily governing of the city, such as the Prime Minister's Office for Regional Administration and Local Government (PMO-RALG) and Ministry of Lands, Housing and Human Settlement (MLHHSD). To a lesser degree, municipal officials show genuine downward accountability to the Wards/Sub Wards or the citizens they are meant to serve (Mng'ongo 2005; Kombe and Kreibich 2006; START 2011).

PMO-RALG is key to the governance of the city, including through its control of employment of human resources. MLHHSD is the "custodian" of all land in Tanzania, and central to land management and enforcement in Dar es Salaam, land being defined as state owned. Moreover, MLHHSD has taken charge of developing the new Dar es Salaam Master Plan (2010–2030).

Centralised Adaptation and Disaster Risk Management

There are no substantive institutional "homes" mandated for either adaptation or disaster risk management with the City Council or the municipality that can build knowledge and coherence between these two agendas and key planning and service operations (as suggested to be critical by Birkmann and von Teichmann 2010).

Most actions on adaptation and disaster risk management are centralised in national offices (Vice President's Office and Prime Minister's Office, respectively) and there are no staff and resources at the level of the Ward and Sub Wards to promote these service sectors. National policies and strategies exist, but provide limited guidance for urban adaptation. The National Climate Change Strategy (2012) provides some general suggestions for what is required for improving urban settlements and enforcement of land use zoning, and possible relocation of flood-affected communities (Kiunsi 2013, see also NAPA 2007). Awareness about climate change adaptation is low.

The most recent national strategy on DRM was approved in 2004 (building on an Act from 1991). The lack of coordination mechanisms between the Commissioner level and Municipal Directors in emergency operations was evident during the 2011 extreme flood that strongly impacted the Suna settlement (ref. Interview 15.9.2012 Ward representative). The emergency response rested heavily on assistance from the Red Cross country office located in Dar es Salaam. While "the military and the police were called upon and were present during the event, they did not have the required operational equipment such as life jackets, vehicles, blankets, first aid. They only contributed human resources", and, "officials at the Ward level during the flood were mostly confused and did not help much" (Interview Red Cross official 5.6.2012).

Urban Planning – Unplanned Expansion of Settlements

Flood risk issues have not been well integrated in urban planning in the case study areas, and land use planning is done with limited active involvement of the citizens, even if this is mandated (Kyessi 2002; Kombe and Kreibich 2006; Vedeld et al. 2012). Expansion of housing in the two informal areas we studied has mostly happened in an unplanned manner. Close to 80 % of the citizens of Dar es Salaam live in unplanned or informal settlements, most of which lack basic infrastructure and services, such as storm drains and basic sanitation facilities. Some 20 out of the total 150 informal settlements in the city have been identified by CLUVA researchers as extremely vulnerable to floods with current rainfall and social patterns (Kombe and Kreibich 2006; John et al. 2012; Herslund et al. 2012; Vedeld et al. 2012; Kiunsi 2013). The failure of the planning and governance arrangement to meet basic service needs is illustrated by the fact that only 11 % of the population have access to sewerage, 25 % to piped water, and more than 90 % of the citizens of Dar es Salaam continue to rely on pit latrines and autonomous systems of sewerage. Moreover, the outlook is gloomy. A water engineer from the key water corporation (DAWASA) claimed that they "have no plans to cover the informal areas with sewerage" (ref. Interview 5.6.2012).

Few, if any, specific legal covenants are in place or enforced regarding risk exposed zones (for example, in the NAPA). The new draft Master Plan identifies flood risk zones, but has no substantive mention of climate adaptation (Interview 4.6.2012 MLHHSD decision maker/planner; see also URT 2011; Moss and Happold 2012; Kiunsi 2013).

Integration of Flood Risk Management into Systems of Coproduction

The case of Bonde la Mpunga illustrates that public agencies and officials are not capable of encouraging or mobilising high levels of citizen participation and input into the local management of flood risks and related land conflicts (Fig. 9.3).

A key governance issue arose some years ago as the central government allowed private developers to construct middle-class houses and new commercial buildings in the settlement in violation of its protection in the original Master Plan from 1979. The new buildings were also constructed such that they blocked natural drainage, and forced flood water into the houses of many of the low-income inhabitants. Local people have protested this development through media, local demonstrations and by mobilising local politicians. Although the central government has sent urban

Fig. 9.3 Drains blocked by solid waste in Bonde la Mpunga (Picture: Trond Vedeld 2012)

planners and water engineers to engage in dialogue, no shared solution acceptable to the local population has been found, presumably because a coalition of private interests and central government interest collaborate to exploit the high value land. The interventions of various state and municipal agencies in local affairs have resulted in conflicts and mutual disengagements, more so than coproduction. A MLHHSD planner reflected on the ambiguous role of the urban authorities; "wrong decisions have been made on transfer of hazardous land to commercial area and residential area" (Interview 5.6.2012 MLHHSD planner).

The weak enforcement of land use zoning also allows for continuous expansion of the settlement, because poor people have few other areas in which to settle (Mng'ongo 2005; Kombe and Kweka 2012; Vedeld et al. 2012). To this end, several of the respondents suggested that, due to the lack of enforcement capacity of higher level authorities, powers should be given to the Sub Ward/Mtaa and Ward levels in land development planning and control; a statutory role they do not have currently (Interview MLHHSD planner 5.6.2012). They are now mostly involved in local development planning with minor development projects (Kombe and Kreibich 2006).

The problem of enforcing land use zoning is compounded by political factors. For example, following the 2011 flood in the Suna settlement, the government decided on a plan to resettle many of the flood affected households (with support of UN-Habitat). However, local residents came together to form a local political bureau of CCM, the main political party, in order to resist what was perceived as "forced" resettlement. This reflects on how local people in informal settlements establish protection through ties to political representatives and local Big men to secure tenure and houses, against the aims of the central government administration (Interview Ward representative 15.9.2012; Interview Official in Disaster Management Office, PMO 5.6.2012). Such "political patronage" illustrates the ambiguity of the government in addressing informality; the administrators seek to move people; politicians engage to protect them.

Saint Louis – Short Background

The city of Saint Louis is a smaller city, yet a regional economic centre in Northern Senegal. It is located on four low-lying islands near the mouth of the River Senegal on the shore of the Atlantic Ocean (fifth largest city in Senegal). CLUVA's analysis of extreme rainfall events, based on climate projection data until 2050, suggests that intensity and frequency of extreme events will significantly increase and enhance flood risks (see Chap. 2 and CLUVA 2014a, b). The city has experienced several recent extreme flood events from the River Senegal, for example in 1994, 1999, and 2003. In 2003, the city was under threat of a major flood which prompted dramatic interventions on the part of the central government. In 2010, more than 80,000 people or 40 % of the 200,000 citizens were affected by floods following extreme rainfall.

It is on the background of significant climate-change risks, increasing population and settlement of people in flood-exposed informal areas, that the urban authorities

from the mid-1990s started to take flood risks increasingly more seriously and from around 2005 responded more systematically to the climate change adaptation agenda. We illustrate these governance issues in Diaminar (our main case) and Goxxumbacc, which are two flood-exposed and vulnerable settlements with a large share of the dwellers living in unplanned areas.

Multi-level Governance and Barriers to Municipal Adaptive Capacity

The degree of centralisation in Senegal is significant, and there are important multi-level governance constraints on the capacity of the municipality of Saint Louis for self-governing and provision of key services and infrastructure (Pinto 2004). However, these constraints do not hinder the combined state-municipality system to provide relatively good services and water infrastructure for flood risk management by African standards. Regional state agencies are actively engaged in urban development and urban investments, and interact directly with municipal and local councillors and civil society actors (Fig. 9.4).

The city of Saint Louis is managed by a City Council with 70 councillors, and is administratively divided in 22 local districts managed by local District Councils. These Councils were introduced in 1994 as an institutional reform to strengthen planning and implementation capacity at local level, and ensure greater participation of local people and civil society. The reform was inspired by the decentralisation trends of the time, and the program was supported by several donor agencies (see below).

Even so, the mandate of the municipality is relatively limited to functions such as economic development planning, environmental management, strategic city planning and development, solid waste management, and development programming and prioritising at the level of the District Councils (in much the same way as in Dar es Salaam). Moreover, the municipality might be at least as constrained financially as the municipality in Dar es Salaam. As suggested by the Prefect, "the Mayor has no administrative, financial or technical services" (Interview 10.5.2012). The total annual budget is only about 3 million Euro per year, or about 15 Euro per capita per year. However, a small budget line item (about 1 % of the budget) is allocated to flood risk management and staff within the city planning office working on adaptation. Moreover, the combined efforts of direct state investments and municipal planning and investments, have resulted in Saint Louis having embarked upon several major investments in protective infrastructure against flooding in recent years, including a system of dykes around the city and expansion of sewerage into some of the informal areas (e.g. Diaminar).

Centralised Adaptation and Disaster Risk Management

Reflecting central state dominance in multi-level governance, the municipality of Saint Louis has no statutory mandate to govern in the areas of adaptation and disaster risk management, even if the role of the city in disaster risk management is

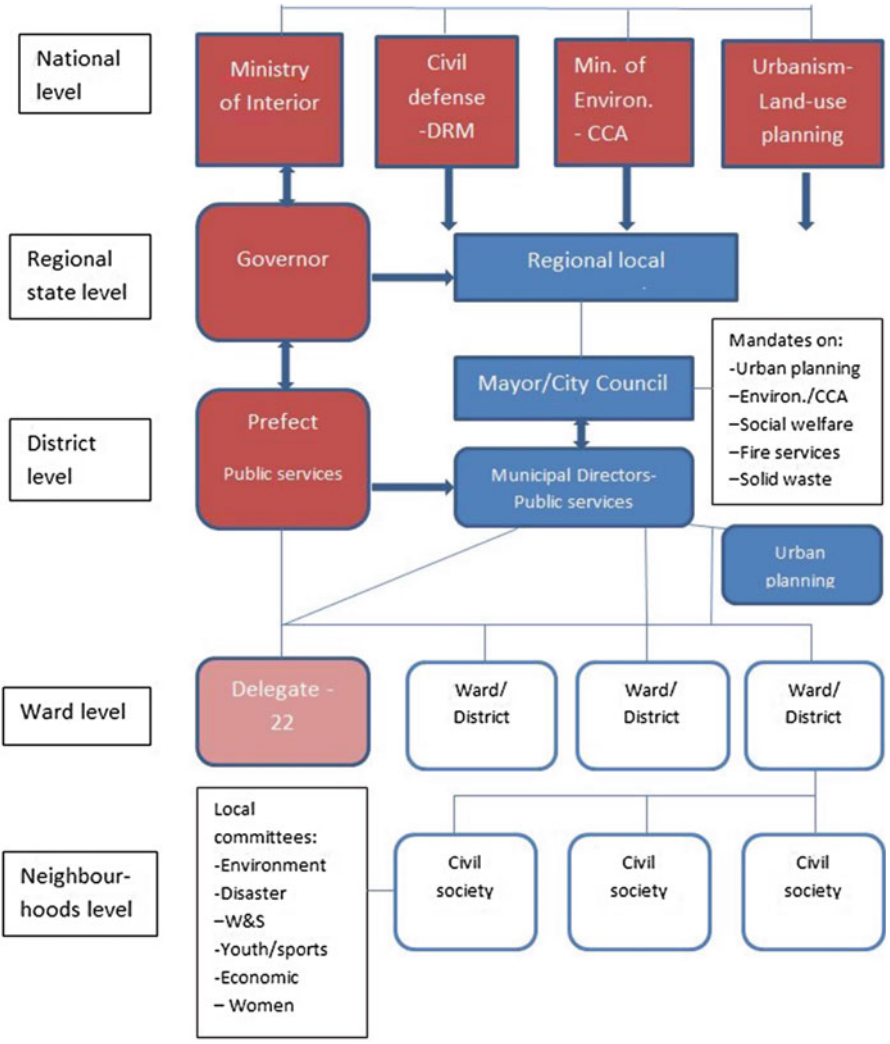

Fig. 9.4 The organisational structure of Saint Louis Municipality and key state agencies engaged in urban development

recognised as important in the national disaster risk management strategy. The National Action Program on Climate Change Adaptation from 2006 has limited guidance on urban adaptation. The agenda is centrally vested with the Ministry of Environment and Protection of Nature (at the time). Disaster risk management is a central state domain and placed with the Civil Protection Agency of the Ministry of Interior. Emergency operations are headed by the Governor at Regional level or the Prefect at departmental level (at the level of the Municipality). A program to enhance coordination of public and civic actors in flood risk

management with the Mayor was launched in the period 2006–2008 and supported by an NGO (Enda-Tiers Monde) and local state authorities (Water department and Senegal National Sanitation Office (ONAS) (Diagne 2007)). However, these governance structures faded as the external support stopped, and few traces of this initiative were found today, beyond the capability left in the city planning and development office (ADC).

Urban Planning and Water Governance

While the city municipality is firmly in control of strategic city planning through its planning office (ADC), land use planning and management is largely in the hands of the regional state body of the national planning ministry. Except for the latest city strategic development plan, Horizon 2030, neither general city plans nor sector plans have directly addressed climate change issues, according to our review of these plans (Horizon 2013). However, given that close to 70 % of the population live in formal and planned areas, the planning system is performing relatively well according to African standards. Moreover, water and flood risk management have been substantially treated in the new strategic plan, reflecting both awareness and knowledge and organisational commitment to these issues on the part of the city planners and the leadership of ADC, as well as with the Mayor (Diagne 2007; Niang 2007; Ndour 2010; Jørgensen et al. 2012). All key agencies involved in water resources, storm water and flood risk management are directly organised under the state, as state bodies or semi-state (sewerage) or private corporations (water supply) under state oversight. Water governance in Saint Louis performs well on some accounts, but not all. For example, a significant achievement is that 97 % of the population have access to piped water. However, only 15 % of the population have access to sewerage, and close to 90 % rely on pit latrines and various autonomous systems of sewerage. ONAS works not only in the formal areas, as the new sewerage program in Diaminar demonstrates. Finally, a key issue is that the Mayor is not involved in the governance structure for the management of the River Senegal.

Our interviews suggest that knowledge and awareness about the linkage between climate change, extreme rainfall and flood risks are present at different levels among urban authorities, including City Council members, water resources engineers (ONAS), environmental officers (located with the Deputy Mayor) and urban planners (ADC), and the Governor, especially within the city planning office (ADC) (Interview 8.5.2012 Environmental officer). ADC is perceived as well-positioned and capacitated to "take on a stronger role in coordinating climate risk responses" (Interview 8.5.2012 NGO representative).

However, covenants in the land use act about illegal settlements in zones close to the river and the coast are mostly not strictly enforced due in part to political factors (e.g. political patronage). "A key problem is the interventions by politicians in critical land management decisions, which makes the state soft [on enforcing land management] ... Often the local state Delegate takes part in political conflicts and enhances local conflicts" (Interview 8.5.2012 City planners).

Integration of Flood Risk Management in Systems of Coproduction

The most interesting and unique aspect of Saint Louis' municipal arrangement is the way a system of coproduction has been institutionalised within the municipal government and governance structure. Through the decentralisation reform that started in 1994, with the establishment of District Councils (DCs) and a City Planning and Development Office (ADC), a political-administrative system developed to support the DCs through preparation of District Development Plans (DDP). This created administrative capacity and systems of local governance and coproduction at local neighbourhood levels. The reform received considerable donor support initially, but the level of support has fallen over the last decade or so (Niang 2007).

The ADC planners actively encourage citizen participation in local development planning through continuous local dialogue and meetings. They ensure local input into the DDPs and related development programs with a bearing on flood risk management. The DCs rally around the preparation of the DDPs and smaller development projects, including flood risk issues. The unique feature of the DCs is that they are constituted from elected representatives of the most important local civil society associations within the local administrative territory. These may be local business groups, youth and sports groups, women's groups or religious groups. We found 23 registered local associations in Diaminar (while Goxxumbacc had 94 such associations), reflecting a particularly strong presence of local civil society organisations. The District Councils are not part of the formal decentralised structure, but in practice work through a coproduction arrangement with city planners. Hence, they stand out as institutionalised coproduction arrangements that bridge the public-private divide (Ostrom 1996, 2005). The Youth and Sports Clubs, interestingly, are the most active in terms of facilitating the mobilisation of people for actions in flood risk preparedness, management and risk reduction in flood exposed communities (Ndour 2010; Vedeld et al. 2012). A problematic side of this municipal organisation is that it raises issues of political accountability because elections are not through secret ballots and the councillors do not report formally to the City Council. However, the structure has proved to have real strength in governance practice regarding the mobilisation of local people for planning, flood risk management and development. ADC planners involve the councillors which subsequently mobilise own citizen members for discussions. Many genuine and broad needs and demands are discussed in these local encounters and subsequently included in the DDPs (Diagne 2007; Ndour 2010; Coly et al. 2011a, b, c). The success of the Saint Louis local governance model has made it a country-wide approach to city and sub-city level governance in Senegal.

For example, in Diaminar, constructive interaction between ADC and the District Council has resulted in enhanced local flood risk awareness (through local training assisted by a local NGO) and the preparation of a local flood action plan and mapping of flood risk sites and a new drainage/sewerage system being established (Fig. 9.5). The local District Development Plan (DDP) has been predominantly oriented towards finding solutions to flooding. Diaminar is typical of an

Fig. 9.5 Construction of new drains and sewerage in Diaminar (Picture: Trond Vedeld 2012)

informal settlement allowed to evolve on low-lying wasteland over the last few decades.

The government recently responded to local demands and embarked upon a sewerage and urban restructuring program in parts of Diaminar (with donor support). This has prompted the need for a resettlement program, with UN-Habitat support and aided by ADC. The people of Diaminar, spearheaded by the Youth groups, would typically engage in cleaning of drains prior to the rainy season, placing sand bags or waste dumps to protect their own houses, and raise door steps of houses and latrines. Local people in 2010 were also observed providing cash as co-funding of fuel or repairs of local pumps operated by the fire brigade. Such civic

engagement is also a reflection of a rich local culture and dense networks of community organisation (Coly et al. 2011c).

Despite such local engagement and community capacity, the Diaminar neighbourhood proved to be highly dependent on external assistance to reduce the impacts of flash floods during the extreme event of 2010, e.g. from the pumping station operated by the fire brigade and the local Red Cross. As observed by the Governor, "The District level is still very weak" and lacks financial resources (Interview 8.5.2012 with Governor's office).

However, Saint Louis has also experienced how centralised political factors can overrule municipal government and lead to maladaptation. In 2003 the city was threatened by a new major flood from River Senegal due to heavy upstream rainfall (cloudbursts). Reflecting in part the experience from the devastating 1999 flood that impacted the whole of Saint Louis, including Goxxumbac which is situated at the spit of "Langue de Barbarie" at the mouth of the river, the Governor, in consultation with the central government, decided to have a canal created across the spit to open up a new outlet for River Senegal. This decision was taken without consulting the Mayor of the city or local citizens (except through a rapidly organised public meeting including people from Goxxumbac). This canal has since 2003 reduced considerably the risk of river flooding in the city of Saint Louis (Kane 2010; Vedeld et al. 2012). But the canal has grown from 4 to 2 km in 10 years, and it has greatly increased other environmental issues such as coastal erosion and salinisation. Several local planners and practitioners considered this an ecological catastrophe.

Comparison Between City Cases in Integration of Adaptation

The subsequent section provided a comparative overview of how the two cities have integrated adaptation into existing service sectors and into the multi-level governance system with reference back to our definition of resilience. Tables 9.2 and 9.3 outline some deliberate actions taken by the government at state and/or municipal levels on adaptation *per se* (as a distinct policy area) as well as actions on the integration of adaptation in governance and selected service sectors (planning, water/storm water, disaster risk management) in Dar es Salaam and Saint Louis. The role of coproduction in multi-level governance is discussed separately.

Discussion of Findings

The comparison suggests that the two cities have chosen very different approaches to the integration of climate change adaptation and flood risk management in the municipal government and multi-level governance system. Climate change adaptation – narrowly defined – remains a fairly nascent agenda in both cities and is not

Table 9.2 Comparison between the case study cities in integration of adaptation and building of '*resilient cities*' in multi-level governance and coproduction

Resilience according to adaptation actions		
Multi-level governance	**Dar es Salaam**	**Saint Louis**
Strategies/policies for adaptation and disaster risk management	Exists only at national level with limited policy guidance	Exists only at national level with limited policy guidance
Organisational homes for adaptation	Only at national state level (Vice President's Office)	Only at national or regional state level
Organisational homes for disaster risk management	At national state, regional state and ward levels	At national, regional state levels, ward, civil society level
Organisational home for flood risk management	At national level	At regional state level
Coordination mechanisms for adaptation and disaster risk management	Only at national level	At regional state level (Governor) for both policy areas
Participation in governance/ planning	Weak	Medium
Engagement of local groups	Weak	Strong
Resources, budgets and mandates for adaptation and flood risk management	Weak at municipal level; no budget for flood risk management	Medium at municipal level; small budget for flood risk management
Coproduction	**Dar es Salaam**	**Saint Louis**
Capacity for coproduction	Weak	Strong; institutionalised

well integrated in planning and governance at municipal level, with some exception regarding the way climate risks are treated by the city planning office in Saint Louis and in local development planning.

Disaster risk management is basically a national and regional state anchored agenda, and the municipalities are not much involved in disaster preparedness or direct coordination of emergency responses. Flood risk management interfaces with all sectors discussed in the study, and reflecting the many public and private actors involved remains a fragmented agenda as regards municipal provision and regulation.

As a policy area, it has several institutional homes and is not well defined and coordinated at municipal levels in either of the cities. The notable exception is regarding the inclusion of flood issues in the District Development Plans and strategic plan for Saint Louis. Adaptation is only indirectly addressed in the draft Master Plan for Dar es Salaam; however, this may become a key element if the municipality engages with CLUVA researchers in a new city Climate Action Plan (Kombe et al. 2013).

Table 9.3 Comparison between the case study cities in integration of adaptation and urban planning and flood risk management

Urban planning	**Dar es Salaam**	**Saint Louis**
Strategic plan and integration of adaptation	New draft Master plan (2013): No direct mention of adaptation; flood risk zones mapped	Horizon 2030 (2013): Flood risk/water resources management integrated. Limited mention of adaptation
Land use planning	Not done for 80 % of city territory; flood risk zones known but not enforced	Done for 70 % of city territory; flood risk zones known but to limited degree
Local development planning	Do not include reference to flood risks	District Development Plans have flood risk management at their core
Disaster risk management (DRM)	**Dar es Salaam**	**Saint Louis**
Early warning system and national-local DRM system	Weakly established DRM system within Prime Minister's office; coordinated with Regional and District Commissioners; no home for DRM with Mayor's office; limited informal early warning at local levels	Reasonably well DRM capacity at national level; DRM coordination committee with Governor; no home for DRM with Mayor's office; only informal early warning system through cell phones
Resettlement of flood victims	Small resettlement program (UN-Habitat); large implementation problems	Small resettlement program (UN-Habitat); large implementation problems
Flood risk/storm water management	**Dar es Salaam**	**Saint Louis**
Organisational home for flood risk and storm water management	No real organisational home with municipality or state; many state and private actors involved	New ministry established for flood risk management (2012); many state and private actors involved; no home with municipality
Sewerage	Sewerage only provided in formal areas	Sewerage mostly provided in formal areas
Storm water infrastructure	Storm drains along main roads only	Dykes, drainage, opened new outlet for River Senegal
Adaptation	**Dar es Salaam**	**Saint Louis**
Adaptation projects (incremental approach)	A few adaptation projects; no major investments in storm water/flood risk management	A few adaptation projects; substantive investments in flood risk management

Multi-level Governance and Coproduction

Regarding the multi-level governance context in Saint Louis the state agencies and semi-state/private corporations (e.g. in water supply, sewerage) contributed directly to substantive urban planning and infrastructural development (drains, dykes) in protection of informal areas. The Governor and the Prefect, including street

level bureaucrats such as the local state Delegate, actively engaged with local Ward officials and civil society groups.

This was less the case in Dar es Salaam. In Dar es Salaam, adaptation and flood risk management had no substantive organisational homes at municipal level and these policy fields were not well integrated at the local level. Public officials acted ambiguously in local contexts and to limited degree encouraged participation of citizen input to management of flood risks, water resources and land use planning.

It seems that the smaller size and particular organisational structure in Saint Louis facilitated closer day-to-day interactions between public officials and local people and an institutionalisation of coproduction in services. There existed relatively close social networks between state level officials and urban planners. This ensured responsiveness and citizen participation in flood risk management. Scale probably contributed to this finding (see also Chap. 5). Processes of deconcentration in Saint Louis appeared coordinated with the decentralised and devolved municipal arrangements to ensure vertical integration by the municipality and urban state planners in collaborative development planning. In turn, better coverage and efficiency in service provision and infrastructure was supported by direct state and donor funding in the city.

A lack of financial and other resources within the two municipalities proved a critical barrier to their capacities to provide services and enable coordinated flood risk management. While both city municipalities operate under extreme financial constraints, Dar es Salaam had a larger annual municipal budget per capita (31 Euro against 15 Euro for Saint Louis).[2] Even so, Saint Louis performs better in terms of investments in flood risk management, sewerage and water supply (according to the indicators chosen, see Table 9.2). This reflects upon Senegal being a higher-income per capita country than Tanzania.

Community Factors

We suggest that the relative efficiency in participation of citizens in coproduction in Saint Louis is also a likely effect of the high community capacity (or social capital) represented by the high density of local civic associations in the local settlements. To this end, there are many types of community groups and local "Big men" involved in governance in both the cities, which is also recognised in the literature on local governance in Africa (Crook 2010; De Sardan 2011; Crook and Booth 2011).

[2] A municipality in Norway would have about 5,000 Euro per capita at its disposal. This is an astonishing difference.

Size, Scale, and Adaptive Capacity of the Municipality

Regarding size and adaptive capacity of the municipality, we find that the larger city Dar es Salaam has executed a set of smaller or incremental adaptation activities, but has done less well in coordination, provisioning, and enabling of flood risk management at the local level than the smaller city Saint Louis. In fact, the large size and complex multi-layered structure may have discouraged such participation. This seemingly contradicts the findings of Rauken et al. (2014), who compared municipalities in Norway, and found that the largest municipalities revealed the most advanced adaptation approaches. We agree, however, that large size potentially might contribute to explain the presence of early awareness among individual officials on adaptation and possibly the adoption of incremental adaptation activities (as in Dar es Salaam). Moreover, if municipalities are extremely small, such as in some Scandinavian countries (with below 10,000 people), resource constraints within the municipality might hinder their ability to pay attention to adaptation (such as lack of specialised staff, knowledge, or finance).

Prior Experience with Extreme Floods

Prior experience with extreme weather events and floods may have been a contributing factor, but probably not a major factor in explaining why climate risks over time have prompted attention by municipal planners and politicians in Saint Louis – more so than we observed in Dar es Salaam. Saint Louis is contextually placed in a more extreme eco-region (Sahel), subject to more frequent floods and droughts, and the city will be expecting more extreme events in the future. Moreover, a greater share of the city population and local economy is affected by floods. However, prior experience with extreme events interfaces with other institutional and political factors, and it is hard to assign relative causal value to either. For example, in Saint Louis the lingering controversy around the opening of the new outlet of the River Senegal in 2003 has maintained flood risks and impacts of flood on the local political agenda (e.g. Interview 8.5.2012 Governor and City Planning Office).

Political Factors

Comparing the two case study cities, we argue that political factors were not decisive for the approaches taken by municipal officials to the integration of adaptation activities in municipal government and governance in the two cities. However, the personal engagement of the city Mayor in Saint Louis likely facilitated the engagement of planners and sector officials in addressing flood risks. This finds support in evidence from the case of Durban, South Africa (Roberts

2010; Roberts and O'Donoghue 2013).[3] Moreover, political factors probably become decisive once important decisions are on the agenda about transitions in the governance or service delivery system, or about whether infrastructural investments should address vulnerability and inequality (Pelling 2011; Bulkeley 2013). Political factors are important for explaining why and how people are allowed to settle in unplanned and risky areas. The decentralisation reform in Saint Louis in 1994/1995 can serve as an example of a transition in urban government which, in turn, influenced local governance and resilience.

Conclusion

The experiences from Dar es Salaam and Saint Louis suggest that resilience as a concept was useful for pointing to important factors that define a resilient city and what and who need to become resilient, i.e. individual citizens and their assets and places and local institutions. None of the cities are in this regard 'resilient'. As conceptualised by UNISDR (2014) resilient cities points to the scope for defined improvements of basic structures and functions of the system at risk (see also IPCC's definition of resilience (2012: 3)). However, given the major barriers revealed in multi-level governance in both cities, we need concepts that are more practical and provide a better understanding on how to act and move beyond resilience and incremental adaptation to transitional adaptation (change in governance) and transformation (more progressive changes within political systems or power structures and value systems). This is in line with Pelling (2011: 69) and Bulkeley (2013).

To this end the concept of coproduction in multi-level governance was fruitful for understanding drivers and barriers to municipal governance. The concept helped focus on the multitude of actors involved, interactional relationships, the high degree of centralisation, financial constraints, and the diverse levels of motivation and levels of responsiveness of public officials to local citizens.

For Saint Louis we argued that public officials actively encouraged citizen participation in planning and their input into the production of public goods (flood risk management), while in Dar es Salaam the system rather discouraged high levels of citizen contributions. Hence, we propose that the arrangement of coproduction within the system of multi-level governance – and the way governance was practised – were the factors that best explained the differences in

[3] The municipality of Durban is recognised internationally as innovative and active in promoting climate change adaptation. Adaptation has been encouraged by municipal officials and integrated in urban development despite limited guidance from the state. The case illustrates the importance of local entrepreneurs – and agency – among the city planners in experimenting with climate strategies and incremental adaptation. It suggests that political factors and limited funding can be overcome. It also suggests that incremental adaptation and learning-by-doing lead to positive results provided there is cooperation across sectors (Roberts and O'Donoghue 2013).

adaptation approaches between the two cities. Large size and scale did not help furthering adaptation. In this regard, we concur with Ostrom (1996, 2005) in that good agency performance resulted not from the capacity or strength of public sector agencies *per se*, but rather from increasing their responsiveness to customers and from cooperation across the public-private divide.[4]

We argue that size and adaptive capacity of the municipality *per se* were not particularly important in the extent to which adaptation and climate risk management were integrated, coordinated and functioned at local level. We suggest that smaller size and simpler organisational structure (Saint Louis), combined with committed leadership and organisational cultures, facilitated active citizen input into service delivery and coproduction in flood risk management.

In conclusion, we propose several additional findings with relevance for theory. First, extreme financial constraints at municipal level did not constitute a decisive hindrance against adoption of incremental adaptation (in any of the two cities). The lack of political guidance and resources could be overcome by engaged municipal officials and local champions (Saint Louis). Second, benign political factors and additional resources were required to promote more progressive transition in governance and larger (infrastructural) investments aimed at addressing risks and vulnerability and inequality on a broad scale (as in Saint Louis). But political factors were not decisive for getting incremental or small-scale adaptation activities going. Third, weak political systems led to maladaptation (opening of the new river mouth in Saint Louis) and/or lack of substantive adaptive actions (Dar es Salaam).

Finally, we argue that transition towards *climate resilient cities* for Dar es Salaam and Saint Louis will require significant strengthening of multi-level governance and capabilities to act and coordinate at city and community levels (vertically and horizontally). Some key politico-institutional measures, given that coordination is foremost required at the local level (according to subsidiarity principles), are;

- Decentralise more powers and resources to city and sub-city levels;
- Enhance greater responsiveness to informality and inequality among public officials;
- Provide the Wards and Sub Wards with a formal mandate, resources and powers for (community-led) land development control and flood risk management;
- Enable greater commitment to participation of citizens in coproduction of relevant services and local planning; and
- Put in place organisational homes and structures for coordination of the joint disaster risk management and climate change agendas, including for storm water management, supported by city-level climate action plans.

[4] That being said, even in Saint Louis the coordination of urban adaptation and flood risk management by hierarchical instruments was relatively weak and fragmented. This is also not surprising given that this has also been observed in many other African countries (Cartwright et al. 2012; Roberts and O'Donoghue 2013; CLUVA 2014b) as well as in many European countries (OECD 2009; Bulkeley 2010; Hanssen et al. 2013; Rauken et al. 2014).

Business as usual is clearly not enough in either of the cities if the aim is to address flood risks in a more resilient and sustainable manner.

References

Adger N, Lorenzoni I, O'Brien K (2009) Adapting to climate change. Thresholds, values, governance. Cambridge University Press, New York

Ardhi (2011) Dar es Salaam case study. Climate change, disaster risk and the urban poor: cities building resilience for a changing world. Ardhi University, Dar es Salaam

Bache I, Flinders M (2004) Multi-level governance. Oxford University Press, Oxford

Betsill M, Bulkeley H (2007) Looking back and thinking ahead: a decade of cities and climate change research. Local Environ 12(5):447–456

Bicknell J, Dodman D, Satterthwaite D (eds) (2009) Adapting cities to climate change. Understanding and addressing the development challenges. Earthscan Climate, London

Birkmann J, von Teichmann K (2010) Integrating disaster risk reduction and climate change adaptation: key challenges – scales, knowledge, and norms. Sustain Sci 5:171–184

Bulkeley H (2010) Cities and the governing of climate change. Annu Rev Environ Resour 35:229–253

Bulkeley H (2013) Cities and climate change, critical introductions to urbanism and the city. Routledge, Oxon/New York

Carmin J, Anguelovski I, Roberts D (2012) Urban climate adaptation in the global south: planning in an emerging policy domain. J Plan Educ Res 32(I):18–32

Cartwright A, Parnell S, Oelofse G, Ward S (eds) (2012) Climate change and the city scale. Impacts, mitigation and adaptation in Cape Town. Routledge/Earthscan, Oxon

CLUVA (2014a) Main page. http://www.cluva.eu/deliverables/CLUVA_ D1.7.pdf/. Accessed 10 Mar 2014

CLUVA (2014b) Main page. Available at http://www.cluva.eu/. Accessed 10 Mar 2014

Coly A, D'Almeida A, Diakhaté MM, Lo M, Sy BA, Ndour NM, Gueye S, Sall F, Sy AA (2011a) Report on climate related hazard in the city of Saint-Louis. Internal CLUVA report (D5.2), University of Gaston Berger

Coly A, Ndour NM, Gueye S (2011b) Assessment of the institutional capacity of the city of Saint-Louis. Internal CLUVA report (D5.3), University of Gaston Berger

Coly A, Ndour NM, Gueye S (2011c) Social vulnerability assessment in the city of Saint-Louis. Internal CLUVA report (D5.3), University of Gaston Berger

Crook RC (2010) Rethinking civil service reform in Africa: 'islands of effectiveness' and organisational commitment. Commonw Comp Polit 48:479–504

Crook C, Booth D (eds) (2011) Working with the grain? Rethinking African governance. IDS Bulletin 42(2):iii–iv, 1–101

De Sardan J-PO (2011) The eight modes of local governance in west Africa. In: Crook RC, Booth D (eds) Working with the grain? Rethinking African governance. IDS Bull 42(2):22–31

Diagne K (2007) Governance and natural disasters: addressing flooding in Saint Louis, Senegal. Environ Urban 19(2):552–562

Douglas I, Alma K, Magenta M, McDonnell Y, McLean L, Campbell J (2009) Unjust waters. Climate change, flooding and the urban poor in Africa. In: Bicknell J, Dodman D, Satterthwaite D (eds) Adapting cities to climate change. Understanding and addressing the development challenges. Earthscan Climate, London, pp 201–223

Hanssen G, Mydske P, Dahle E (2013) Multilevel coordination of climate change adaptation: by national hierarchical steering or by regional network governance. Local Environ 18(8):869–887

Herslund L, Mguni P, Lund DH, Souleymane G, Workneh A, Ouedraogo JB (2012) Exemplary policies, strategies and measures. CLUVA deliverable D3.6. Available: http://www.cluva.eu/deliverables/CLUVA_D3.6.pdf. Accessed 10 Mar 2014

Horizon (2013) Horizon 2030, Nouvelle Métropole Africaine, City Planning Office (ADC), Saint Louis

ICLEI (2014) Main page. Available at http://www.iclei.org. Accessed 10 Mar 2014

IPCC (2012) Summary for policy makers. In: Barros V, Barros V, Stocker TF, Qin D, Dokken DJ, Ebi KL, Mastrandrea MD, Mach KJ, Plattner G-K, Allen SK, Tignor M, Midgley PM (eds) Managing the risks of extreme events and disasters to advance climate change adaptation, A special report of Working Groups I and II of IPCC. Cambridge University Press, Cambridge/New York, pp 1–19

John R. Mayunga J, Kombe W, Fekade R, Ouedraogo JB, Tchangang R, Ndour NM, Ngom T, Gueye S, Sall F (2012) Preliminary findings on social vulnerability assessment in the selected cities. CLUVA deliverable D5.4. Ardhi-ARU, Dar es Salaam. Available: http://www.cluva.eu/deliverables/CLUVA_D5.4.pdf. Accessed 10 Mar 2014

Jørgensen G, Herslund L, Sarr C, Nakouye N, Sine A, Workneh A, Workalemahu L, Bekele E (2012) Base line scenarios for urban development of selected case study areas. CLUVA deliverable D3.5. Available: http://www.cluva.eu/deliverables/CLUVA_D3.5.pdf. Accessed 10 Mar 2014

Kane C (2010) Vulnérabilité du système socio-environnemental en domaine sahélien: l'exemple de l'estuaire du fleuve Sénégal. De la perception à la gestion des risques naturels. Thèse de doctorat de 3e cycle, Université de Strasbourg

Kiunsi R (2013) The constraints on climate change adaptation in a city with large development deficit: the case of Dar es Salaam. Environ Urban 25:321–333

Kyessi AG (2002) Community participation in urban infrastructure provision, servicing informal settlements in Dar es Salaam. Published PhD thesis. SPRING publication series no. 33, University of Dortmund, Germany

Kern K, Alber G (2009) Governing climate change in cities: modes of urban climate governance in multilevel systems. In: OECD competitive cities and climate change, OECD conference proceedings, Milan, pp 171–196

Kombe WJ, Kreibich V (2006) Governance of informal urbanization in Tanzania. Mkuki Na Nyota, Dar es Salaam

Kombe WJ, Kweka C (2012) Institutional analysis for climate change in Dar es Salaam City, Internal CLUVA report (D5.1). Ardhi, Dar es Salaam

Kombe WJ, Kyessi A, Kassenga G, Shemdoe R (2013) City local climate action plan 2014–2020 of African cities facing climate change. CLUVA (D5.7). ARDHI University

Manor J (2011) Perspective on decentralisation, Working paper no. 3, ICLD. Swedish International Centre for Local Democracy, Visby

Mng'ongo O (2005) Browning process: the case of Dar es Salaam. Published PhD thesis, Royal Institute of Technology, School of Architecture and Built Environment

Moss D, Happold B (2012) Afri Arch, BuroQ. Dar es Salaam Master plan 2030. Preliminary Draft, Dar es Salaam

National Adaptation Programme of Action (NAPA) (2007) Vice President's Office, Division of Environment, Dar es Salaam

National Climate Change Strategy (2012) United Republic of Tanzania, Vice President's Office, Environment Division, Dar es Salaam

Ndour NM (2010) Intégration de la question de l'eau dans la gouvernance urbaine: analyse des systèmes de décision dans la Commune de Saint-Louis. Mémoire de Master 2, UGB, Géographie

Niang D (2007) Gouvernance Locale, maitrise d'ouvrage communale et stratégies de développement local au Sénégal: l'expérience de la Ville de Saint-Louis. Thèse de doctorat de 3^{ieme} cycle

O'Brien K (2012) Global environmental change II: from adaptation to deliberate transformation. Prog Hum Geogr 36(5):667–676
OECD (2009) Competitive cities and climate change. In: OECD conference proceedings, Milan, Italy, 9–10 Oct 2008
Osborne S (2010) Introduction: the (new) public governance: a suitable case for treatment? In: Osborne S (ed) The new public governance. Emerging perspectives on the theory and practice of public governance. Routledge, Oxon
Ostrom E (1996) Crossing the great divide: coproduction, synergy, and development. World Dev 24(6):1073–1087
Ostrom E (2005) Understanding institutional diversity. Princeton University Press, Princeton/Oxford
Pelling M (2011) Adaptation to climate change: from resilience to transformation. Taylor & Francis Books, London
Peters BG (2008) The two futures of governing. Decentering and recentering processes in governing, 114 Reihe Politikwissenschaft/Political science series. Institut für Höhere Studien, Wien
Pinto RF (2004) Service delivery in francophone West Africa: the challenge of balancing deconcentration and decentralisation. Public Adm Dev 24:263–275
PMO-RALG (2012) Annual budgets for Tanzanian municipal councils. Online. http://beta.pmoralg.go/tz/lginformation/monotor1a.php. Accessed 15 Sept 2012
Rauken T, Mydske PK, Winsvold M (2014) Mainstreaming climate change adaptation at the local level. Local Environ. doi:10.1080/13549839.2014.880412
Roberts D (2010) Prioritizing climate change adaptation and local level resilience in Durban, South Africa. Environ Urban 22(2):397–413
Roberts D, O'Donoghue S (2013) Urban environmental challenges and climate change action in Durban, South Africa. Environ Urban 25(2):299–319
Satterthwaite D (2011) Editorial. Why community action is needed for disaster risk reduction and climate change adaptation? Environ Urban 23(2):339–350
Satterthwaite D, Dodman D (2013) Towards resilience and transformation for cities within a finite planet. Environ Urban 25(2):291–298
Satterthwaite D, Huq S, Pelling M, Reid H, Lankao PR (2007) Adapting to climate change in urban areas. The possibilities in low-and middle-income countries, Human settlements discussion paper series. IIED, London
Satterthwaite D, Huq S, Pelling M, Reid H, Pelling M, Lankao PR (2009) Adapting to climate change in urban areas: the possibilities and constraints in low- and middle-income nations. In: Bicknell J, Dodman D, Satterthwaite D (eds) Adapting cities to climate change. Understanding and addressing the development challenges. Earthscan Climate, IIED, London, pp 3–47
Sorensen E, Torfing J (2009) Making governance networks effective and democratic through metagovernance. Public Adm 87:234–258
Sorensen E, Torfing J (2014) Enhancing social innovation by rethinking collaboration, leadership and public governance, social frontiers. The next edge of social innovation research. Nesta, Glasgow
START (2011) Urban poverty & climate change in Dar es Salaam, Tanzania: a case study. Ardhi, Dar es Salaam
UN-HABITAT (2011) Global report on human settlements 2011. Cities and climate change. Nairobi, UN-HABITAT
UNISDR (2012) 2012 making cities resilient report. UNISDR, Geneva
UNISDR (2014) Online page. http://www.unisdr.org/campaign/resilientcities/toolkit/essentials. Accessed 8 Mar 2014
URT (2011) New draft urban development and management policy. United Republic of Tanzania (URT), Unpublished. Dar es Salaam

Vedeld T (2003) Democratic decentralisation and poverty reduction: exploring the linkages. Forum for Development Studies No 2, Norwegian Institute for Foreign Affairs (NUPI), Oslo

Vedeld T, Hellevik S, Kombe W, Kweka-Msale C, Coly A, Ndour NM, Guéye S, Klausen JE, Saglie I-L (2012) Report on planning system and government structure in 2 case cities. CLUVA deliverable D3.1. Available: http://www.cluva.eu/deliverables/CLUVA_D3.1.pdf. Accessed 10 Mar 2014

Weber EP, Khademian AM (2008) Wicked problems, knowledge challenges, and collaborative capacity building in network settings. Public Admin Rev March/April 2008

Ziervogel G, Parnell S (2012) South African coastal cities: governance responses to climate change adaptation. In: Cartwright A, Parnell S, Oelofse G, Ward S (eds) Climate change and the city scale. Impacts, mitigation and adaptation in Cape Town. Routledge/Earthscan, Oxon, pp 223–243