Addressing urban inequalities through community-based disaster risk reduction: a case study of responses to periodic flooding in the low-income suburbs of Dakar, Senegal.

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DECLARATION OF AUTHORSHIP

I, Katarína Šoltésová confirm that the work presented in this thesis in my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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ABSTRACT

Negative impacts of flood risk constitute an urgent issue for the residents, policy makers and the international community shaping African cities. Disaster risk reduction is increasingly mainstreamed into urban policy, but there appears to be great variation in ways through which local communities are engaged in a meaningful discussion with local authorities and other formal and informal actors. This research aims to place urban community-based disaster risk reduction (CB-DRR) in a broader context, focussing on links between periodic hazard, extensive urban risk and change in urban social relations. The principal question addressed in this research was: how do social relations evolve in the context of extensive urban disaster risk? A grounded theory approach and situational analysis was applied in a case study of the past decade of community interventions in Pikine, Dakar's low-income suburbs, which suffer from recurrent seasonal flooding and permanent waterlogging. The first half of the thesis addresses impacts of periodic disasters and extensive risk on life in low income urban neighbourhoods and ways in which CB-DRR evolves with periodic disasters and extensive risk. The principal finding is that extensive risk drives social fragility and physical uncertainty. Community engagement is motivated by a collective consciousness of a need to avert a social deterioration in water-affected neighbourhoods. The second half of the thesis elaborates on links between CB-DRR and broader urban development pressures. Community actors construct opportunity within a complex institutional environment where city-level urban development policy and practice shape risk at neighbourhood level. Examples of three major state-led infrastructure projects are analysed in relation to the conditions they create for community initiatives to progress or be stalled. I show that over the past four decades, a distinct urban culture and an institutional environment have been created in Senegal which enable youth organisations to assume leadership in CB-DRR.

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LIST OF ACRONYMS

ADM	Agence de Développement Municipal
ADQ	Association pour le Développement du Quarter (neighbourhood development CBO)
AFD	Agence Française de Développement
APIX	Agence Nationale pour la Promotion de l'Investissement et des Grands Travaux (National Development and Investment Agency)
ASC	Association Sportive et Culturelle (Cultural and Sports CBO)
CB-DRR	Community-based disaster risk reduction
CBO	Community-based organisation
DRM	Disaster risk management
DRR	Disaster risk reduction
DSM	Diamaguène Sicap Mbao (a commune in Pikine)
DTK	Djiddah Thiaroye Kao (a commune in Pikine)
ENDA	Environnement et Développement du Tiers Monde (SN NGO)
ENDA	Enda Tiers Monde (Senegalese NGO)
EngD	Engineering Doctorate
FCFA	West African CFA franc
FDV	Fondation Droit à la Ville (Foundation Right to the City)
FGD	Focus groups discussion
GIE	Groupement d'Intérêt economique (Economic Interest group CBO)
GIZ	German Technical Cooperation
GoS	Government of Senegal
GPF	Groupement de promotion feminine (formal women's groups)
GRN	Guinaw Rail Nord (a commune in Pikine)
IAGU	L'Institut Africain de Gestion Urbaine (SN NGO)
IIED	International Institute for Environment and Development
LA21	Local Agenda 21
LG	Local government
MRAZI	Ministère de la Restructuration et de l'Aménagement des Zones d'Inondation (Min. of upgrading and redevelopment of flooded zones)
NGO	Non-governmental organization
ONAS	L'Office National de l'Assainissement du Sénégal (Senegal's National Water Agency)
ORSEC	Le Plan d'Organisation des Secours (National Relief Coordination Plan)
PAQPUD	Programme d'Amélioration des Quartiers Périurbains de Dakar (urban sanitation programme in Dakar's peri-urban neighbourhoods)
PROGEP	Projet de Gestion des Eaux pluviales et d'Adaptation au Changement Climatique pour le Sénégal (project for rainwater management and climate change adaptation in Selegal)
SDI	Slum Dwellers International
UNDP	United Nations Development Program
ZAC	Zone d'Aménagement Concerté (Mixed Housing Development Zone)

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1. INTRODUCTION

1.1. Flood risk in African cities

This thesis aims to gain greater understanding of how periodic hazards and extensive risk shape social relations in African cities. This Engineering Doctorate project was undertaken in partnership with my industrial sponsor, the International Institute for Environment and Development (IIED).[1] An important stream of IIED's work focusses on urban poverty. The organisation champions action-research projects in collaboration with partners representing the residents of low-income settlements. IIED's scholarship on risk accumulation in African cities has expanded rapidly in recent years, responding to the predicaments of fast growing African urban societies. This thesis is a contribution from a West African city, complementing IIED's studies in other locations across the continent. Initially in 2011, the research project started as a contribution to a larger collaborative action-research study coordinated by IIED and implemented with three local partner organisations in Dakar, Accra and Kampala. The aim was to gain deeper understanding of vulnerability to climate change impacts across low-income settlements in the three cities. After the conclusion of the collaborative project I continued the present study independently with the support of one community group in Pikine (Dakar) and through informal affiliation with three local NGOs.

African cities are characterised by an accumulation of physical, economic and societal risks (Dodman et al. 2016). They represent distinct conditions in which the residents of low-income neighbourhoods are disproportionately exposed to hazards due to vulnerability inherent in underserviced urban areas with inefficient or absent basic protective infrastructure (Douglas et al. 2008; I. O. Adelekan 2010). The urban poor enjoy minimal support from the state and therefore rely on alternative arrangements for risk reduction. These arrangements are predominantly informal and frequently community-based. This study looks at

[1] https://www.iied.org/human-settlements-research-group

urban community-based disaster risk reduction (CB-DRR) and its role in reducing disaster risk. CB-DRR addresses the collective capacity of residents in low-income settlements to prepare for, respond to and recover from disaster events. Disaster risk reduction (DRR) is increasingly mainstreamed into development policies, but there appears to be significant variation in the opportunities that organised urban communities have in order to engage in a purposeful and meaningful discussion with local and state authorities as well as with other formal and informal actors. This research project focused on interventions implemented by community organisations fighting the impacts of extensive risk associated with flooding. Such interventions, even when highly localised, require engagement of actors at different scales of urban governance structures. This study of urban CB-DRR therefore includes an analysis of cross-scale actor interactions and their impact on neighbourhood-level risk. I examine CB-DRR in the context of urban flood-risk, demonstrating that mismanagement of excess water constitutes an element in a cascade of hazards and contributes to further accumulation of risk in low-income neighbourhoods.

Flooding in African cities is becoming an urgent concern for local residents, local policy makers and the international community (CDKN 2012; IPCC 2012). Flood risk in urban areas is omnipresent as it forms a continuum ranging from everyday risk manifested through small-scale hazards (*e.g.* risk of malarial or diarrhoeal infections in water-affected areas), to periodic and sporadic hazards of varying intensity (*e.g.* seasonal rainfall which causes flash floods) and to rare and frequently destructive hazards presenting intense risk (*e.g.* major storms with the power to tip the wider ecosystem balance) (Bull-Kamanga 2003).

Given the location of urban settlements, flooding is often associated with sea level rise and storms driving coastal erosion and water intrusion, river flooding triggered by rainfall in upstream regions, destruction of natural flood zones and intensive localised rainfall, which results in major run-off. Most studies of urban flooding in African cities show that flood risk is a consequence of the expansion of urban settlements into low-lying zones, which used to be wetland ecosystems

hitherto exploited for agriculture. Remaining natural spaces and protective ecosystems in African cities are under great pressure (Dossou & Gléhouenou-dossou 2007), which triggers mounting calls for their protection by means of green technology and through creation of natural buffer zones (Kithiia & Lyth 2011; Douglas 2016). The case analysed in this research echoes the above, but it is less concerned with the physical hazard. I look at urban flooding and long-term waterlogging caused by mismanagement of the urban water cycle and an associated sanitation crisis. In so doing, I dispense with the natural hazard as a prerequisite for flood risk.

Many African national and local governments fail to provide, expand and maintain basic infrastructure to reduce flood risk in the face of ever increasing demographic pressures (I. O. Adelekan 2010; Dodman et al. 2016). This puts immense pressure on communities because of the scale of interventions required to produce positive impacts across an urban system. Even in cities where flooding has been a common seasonal phenomenon and where, for years, traditional local technologies provided sufficient protection, these have become eroded, modified and outgrown so that they no longer fulfil their protective role (Odemerho 2015). Incremental, but cumulative changes made by local residents to the urban environment, household-based coping and adaptation strategies provide a partial response to new threats, but on some occasions they risk becoming maladaptive, prone to diverting risks and impacts in time and space (Schaer 2015). Residents of low-income settlements also face violence from authorities with anti-poor and politicised agendas who use flood risk as an argument to legitimise forced evictions (Bouquet & Kassi-Djodjo 2014). Large urban development projects are equally a threat to communities as they have an immense power to modify exposure and displace flood risk (Douglas et al. 2008).

This thesis enquires into local conceptions of risk and how they shape community-based risk reduction. Particular attention is paid to local actors' sensibilities to urban social cohesion. Local people's knowledge of hazards, awareness of risk and ensuing adaptation strategies are not always studied in detail (Cisse & Seye 2016).

There is a need to understand how communities of urban poor who face chronic and seasonal flooding can build resilience at the scale of the individual, household, community and city (Dobson et al. 2015). But community knowledge about flood risk and its reduction is not easily heard by professionals and it is a laborious process to see it incorporated into expert-led planning or priorities set out by politicians (Odemerho 2015). People living and working in conditions of risk, particularly low-income residents, are therefore rarely supported by planning systems and emergency services that should serve them (I. O. Adelekan 2010; I.O. Adelekan 2010; Kithiia & Dowling 2010; Dossou & Gléhouenou-dossou 2007; Korah & Cobbinah 2016). Institutional arrangements related to the management, control and regulation of urban flood risk are fragmented and non-participatory (Wahab & Falola 2017) and it is often difficult for community organisations to secure continued support from politicians and local governments (Castan Broto et al. 2015). There are normative calls to institute participatory processes and stakeholder engagement to address urban flood risk, not least because of the low capacity of local government to address the increase in adverse impacts (Douglas 2016; Kithiia & Dowling 2010). But practical examples do exist of cases where complex urban risk and cascading hazards have been addressed through participatory approaches, with more or less successful outcomes (Castan Broto et al. 2015; Diagne 2007). Many such advances are achieved through negotiations within both formal institutional settings and through informal networks reaching across multiple levels of actors engaged in urban governance. This thesis examines how an institutional environment enabled community participation to emerge from initiatives implemented intermittently over three decades and how such opportunities were used by community actors to manoeuvre their way forward.

1.2. Pikine, a case for the study of extensive risk in a water-affected city

The empirical site for this qualitative study comprised a number of neighbourhoods in Pikine, a municipality in the urban region of Dakar, commonly known as the low-income peri-urban suburbs of Dakar. Pikine is the younger and poorer sibling of Dakar, but the latest national census indicates that the population of the two municipalities is almost equal, each just over one million. Pikine is said to be both a dormitory for many of Dakar's workers and a web of numerous vibrant economic and cultural centres which make it a fast expanding city. For over a decade, flooding has been a major challenge faced by the residents of Pikine. Intermittent seasonal flooding affected a few neighbourhoods already in the late 1980s, but in 2005 the urban region's ecological tipping point was reached and numerous neighbourhoods came to experience long-term waterlogging, which intensifies during the annual rainy season. In addition, the 2008 global food price crisis hit Senegal's import-based food system and the rainy seasons of 2009, 2012 and 2015 brought new episodes of extreme flooding. Adverse effects of long-term waterlogging, compounded by a crisis in solid waste management and sanitation, further contributed to the protracted uneasy condition faced by Pikine's residents.

In 2005, an emergency plan elaborated by the Government of Senegal triggered state-assisted and autonomous resettlement into less urbanised zones on Pikine's periphery. Additional momentum was created a year later, through a major transport infrastructure project. By 2014, a new highway was traced through Pikine's flooded quarters in order to connect Dakar to its hinterland and eventually constitute a larger urban region incorporating secondary cities within a radius of *ca.* 100km from the capital. Within water-affected Pikine, these developments increased flood risk in low-income neighbourhoods. The Government continued pumping excess water and it eventually embraced a major project to develop a primary drainage network across Pikine.

Pikine has a vibrant civil society, in which different types of community organisations play an important role in reducing the vulnerabilities of varied groups of the population. A culture of community organising is manifested through women's groups, youth-led sports groups or neighbourhood development associations. In the late 20th century, such organisations coalesced around a neighbourhood-centred urban movement which cherished the urbanites' capacity for autonomy and self-help. Participation of local residents in the planning and management of local development has also been promoted by the state through its intermittent support of participatory planning and upgrading projects. Non-governmental organisations (NGOs) are frequent mediators between the state, local government authorities (LG) and the increasingly formalised community groups. A deep culture of community organising promises new insights about urban sociality. These conditions make Pikine a suitable urban system for the study of local impacts of extensive urban risk.

Guiding this research are the following principal and subsidiary questions:

Principal question

- How do periodic hazards and extensive risk shape social relations in African cities?

Subsidiary questions

- What are the social processes triggered by periodic hazards and by extensive risk in low-income urban areas?
- How do distinct forms of urban CB-DRR evolve in the context of periodic hazards and extensive urban risk?
- How do urban development pressures shape urban risk?
- How are urban CB-DRR interventions embedded in existing local social and institutional relations?

1.3. Structure of the thesis

The structure of the thesis is as follows. In the next chapter, I review literature on urban risk in African cities, emphasising extensive risk. I then look at writings on community-based disaster risk reduction and I address the vulnerability approach through a lens of gender and disaster studies. Subsequently, I review literature on associational life in African cities, highlighting a critical discussion of African civil society and novel approaches to the understanding of African urban sociality. To conclude, I look at literature specific to the empirical case, providing an account of select processes in Dakar's recent urban political history.

The methodology chapter is divided in two parts. The first part outlines relevant background about Pikine, focussing on the essential socio-economic data and environmental conditions, particularly related to seasonal rainfall and flood risk. It also provides detail about Senegal's official disaster risk management (DRM) policy and concludes with a typology of community organisations active in Senegal's urban areas. The second part of the methodology chapter sets out the theoretical underpinnings of this qualitative research project. I then discuss research design, key methods used for data collection, the inner workings of my fieldwork and my approach to data analysis.

Empirical data is presented in chapters 4 to 7, which are composed according to the following logic. Chapters 4 and 5 present field data ordered in a linear fashion whereas chapters 6 and 7 provide a cross-scale analysis of select urban interventions in three different communes of Pikine. In chapter 4 I examine neighbourhood-level processes which drive the production of extensive risk and social uncertainty. Chapter 5 documents the evolution of community-based actions aimed at reducing disaster risk and shows how changing perceptions of risk shape interventions developed by local youth CBOs. I show that behind technical interventions is a deep concern about the fragility of social relations. Chapter 6 focuses on a complex spatial and institutional environment and documents linkages between infrastructure development projects and risk reduction interventions implemented at different scales of the urban system. I

analyse three major state-led urban development projects, each implemented over a decade, focussing on interactions between the state and the local residents as well as flood risk related outcomes. In chapter 7, I elaborate a detailed analysis of one of the three interventions, a youth-led CB-DRR project aimed to create a neighbourhood park. I focus on the identity of these principal actors and how it affects the nature of their engagement with other urban actors. I further document how institutional legacies inherent in the city's political and civic history shape negotiations between actors. I then present data to suggest that interventions in CB-DRR are strategically used by urban youth to alter existing power relations.

The last chapters of the thesis cover a detailed discussion of principal issues emerging from the data. Switching between the scale of the neighbourhood to that of the city, I trace connections between the production of flood risk, the domain of community-based disaster risk reduction and urban development processes. A conclusion chapter summarises the key contributions of the research.

2. REVIEW OF LITERATURE

2.1. Urban risk in African cities

This chapter reviews literature on urban risk in African cities, communities-based disaster risk reduction, gender and disaster's, associational life in African cities to conclude with an account of Dakar's recent urban political history.

2.1.1. Africa's urban transition

The following section of the review of literature outlines the principal themes in the discussion of urban risk in African cities. In the first part I discuss the demography and form of urban centres, followed by the nature of economy and society. The second part identifies three approaches which have contributed to a nuanced view of urban risk in African cities: these include the spectrum of risk, systems thinking and global environmental change.

An important discussion has been one concerned with processes driving urban population growth in African cities (Potts 2012; Parnell & Pieterse 2014; Parnell & Walawege 2011). Pieterse and Parnell (2014) have argued that the overall rate of population growth in African cities has led to an urban revolution not only in numbers, but also in Africa's urban leadership, institutions and technical domains such as design, technology and finance. During the post-independence decades, African countries experienced high levels of urban growth, particularly in capital cities and important regional administrative centres (AFD 2008), although this trend has slowed down and urban population growth rates in some countries are not higher than the steadily increasing national population growth rate (Potts 2012). McGranahan *et al.* (2009) reported that African cities' urban population was growing at about 3.3 percent p*er* year, being the combined outcome of an overall population growth rate of 2.2 percent *per* year and an urbanization rate of 1.1 percent *per* year. Natural population increase plays a critical role in the growth of African cities, whereas circular migration (rural-urban as well as urban-urban) is an important socio-economic phenomenon which contributes to the dynamic nature of African cities and constitutes an important risk reducing strategy.

Acknowledging that an important proportion of urban residents have multi-generational roots in cities is relevant for urban risk reduction. It has implications both for how urbanites know and perceive risk, for the breath of their social networks and for their understanding of a complex web of urban institutions and a myriad of actors.

Urban form and location of cities condition exposure to hazards as well as internal capacities to manage change. Coastal cities, many of which are major regional metropolises, are increasingly at risk due to exposure to hazards such as coastal erosion, storms or saline intrusion related to sea-level rise (McGranahan et al. 2007). Given the growing necessity of operating within a global economy, large coastal cities are also important national hubs connected to networks of intermediate and small cities and rural areas. Repercussions within major cities are thus likely to be felt in urban and rural areas beyond the immediately exposed zones.

Small and intermediate cities have been studied to a lesser extent, partly because of lacking incentives in the field of urban scholarship (Parnell & Pieterse 2016) and because of a bias among national elites, government bodies and development agencies who prioritise large hubs of global commodity exchange (Satterthwaite 2016b). Small cities are central to networks through which resources, people, information and investment flow in countries. There is increasing evidence that they constitute a category of growing importance (Wisner et al. 2015). Notwithstanding methodological challenges, Satterthwaite (2016) showed that urban centres with a population under 20 000 inhabitants and those with a population between 20 000 and 50 000 inhabitants house the highest proportion of the overall urban population in many African countries. In some cases, cities below 50 000 inhabitants may constitute as much as 15% of the overall national population. In Senegal in the 1980s, the capital city Dakar housed 9.4% of the country's population whereas in 2000 it was only 6.7%. Simultaneously, the number of secondary cities with a population of 10 000+ rose from 8% in 1960 to 23% in 1980 and up to 42% in 2000, with an anticipated 59% in 2020 (AFD 2008).

Small cities manifest distinct vulnerabilities which stem from their size and dependency on external actors and processes. As a result of chronic underfunding and increasing spatial extensions, inadequate provision of basic infrastructure is the major risk factor (Moriconi-Ebrard et al. 2016). Furthermore, local governments in secondary cities have only limited capacity to muster technical expertise and available resources. Partial fiscal decentralisation and unequal relationships between powerful elites in urban centres and urban peripheries maintain these conditions (Diep et al. 2016; Wisner et al. 2015). The latter, however, is not unique to secondary cities: large cities are often governed as multiple competing municipalities without an overarching strategic authority at the level of the urban region (David & Leck 2015).

2.1.2. African urban economy and society

The demography of African cities produces spatial, social and economic conditions which drive environmental, economic and social risk. In a substantial review of literature on risk in African cities, Dodman *et al.* (2016) examined how aspects of urban form, economy and society across African cities constitute dynamic conditions for, and drivers of, production and accumulation of risk. African cities have the opportunity to benefit from a demographic dividend, but the potential is not automatically harvested because African urbanisation, industrialisation and education have been decoupled. Informality is the predominant mode of urbanisation and of urban economies. Informal employment in commerce, transport and increasingly the construction sector provide jobs for an important proportion of men, women and youth. Nevertheless, many of these jobs present severe risks to personal health and safety (Dodman et al. 2016; Dodman et al. 2013). Informal urban economies are also often managed by tightly connected ethnic or religious groups which present new risks through processes of segregation and exclusion (Bredeloup et al. 2008). Informal actors and systems are flexible and can rapidly respond to changing local needs but reliance on informal service providers across many sectors also makes living in highly monetised African cities expensive for low-income residents. Access to and affordability of food are crucial factors shaping the vulnerability of low-income

urban residents—both because climate variability and change can disrupt this and because poor nutrition can increase susceptibility to hazards (Tacoli et al. 2013). Large proportions of urban residents depend on informal arrangements to secure their basic needs. Informal land delivery often results in occupation of inappropriate locations, poor layouts and deficiencies in infrastructure and services and can adversely affect environmental conditions within the fragile urban ecosystem (Parnell & Pieterse 2014). Insecure tenure will compromise building quality, plot size and accessibility within entire settlements. These weaknesses are frequently the result of relationships between informal systems and formal governments, including their land administration systems. However, the strength of informal land systems is their relative flexibility to provide land to meet the housing needs of various socio-economic groups (Rakodi 2007).

Taylor and Peter (2014) argued that a second wave of urbanisation is currently taking place globally, with most consequential changes happening within the largely informal low-income neighbourhoods in African and Asian cities. Disaster risk is both spatially and socially unequally distributed and it has been acknowledged that most vulnerable to environmental hazards are workers and residents in low-income informal settlements (Adelekan et al. 2015; Pelling & Wisner 2009; IPCC 2012). Basic infrastructure is an essential component of built-in resilience, but infrastructure in low-income neighbourhoods has been chronically deficient or missing altogether (Dodman et al. 2016; Pharoah 2016; Mitlin & Satterthwaite 2012). Acceptance of a life in high-risk areas is conditioned by opportunities for women and men to earn income and to keep access to services, including schools and administration—often gained through people's social networks (IFRC 2010). Children and youth are highly vulnerable in environments where health and education have been chronically underfunded (Dodman et al. 2016).

2.1.3. Approaches to African urban risk: risk spectrum, systems, global environmental change

In addition to highly damaging disaster events, there is growing concern about extensive risk and everyday hazards, which affect people's lives in African cities (Adelekan et al. 2015). Extensive risk has been defined as a risk layer with high frequency and low severity losses (UNISDR 2015; UNISDR 2011). It manifests through unequally distributed recurrent small-scale disasters such as landslides, periodic flooding and long-term waterlogging, small-scale epidemics or highly localised road accidents. Whereas small-scale everyday disaster events do not overwhelm urban systems, their cumulative impact on morbidity and displacement as well as loss and damage is important (Satterthwaite 2016a). Drivers of extensive risk are badly planned and managed urbanisation, environmental degradation and inequality, which are often produced alongside economic growth (UNISDR 2015; Bull-Kamanga 2003). Extensive risk is significant in urban areas where inherent vulnerability results from gaps in basic risk reducing infrastructure (Twigg 2015). At stake is a gradual deterioration of daily standards of urban living and particularly the erosion of capacity of low-income households, small businesses and local governments (Pelling & Wisner 2009). Aggregated costs associated with extensive risk include valuable and scarce resources allocated by households to counter both direct and indirect impacts of everyday hazards and frequent small-scale disaster events. Large proportions of these costs include expenditure on maintenance of physical structures to allow keeping a minimal living standard. They also include expenditures associated with basic health care, temporary rehousing and disrupted schooling. Extensive risk internalises social, economic and environmental vulnerability and it affects human development. Attribution of everyday hazards and their impacts is complicated as impacts may be both direct and indirect. They are frequently geographically dispersed, and may only be apparent and quantifiable when accumulated over time. Systematic records of small-scale disasters and impacts of everyday hazards have therefore been rare across major international disaster databases. However, sustained advocacy to systematically collect and update such data increasingly

appears to lead to more significant evidence of a global reality in which cumulative costs associated with extensive risk constitute a major burden on urban living and the management of cities (Satterthwaite 2016a). According to UNISDR (2015) a majority of damage and losses since 1990 have been associated with disaster events within the category of extensive risk.

Socio-ecological systems and associated views of urban resilience have become important approaches in understanding risk and its reduction in cities (Folke 2006; Ernstson et al. 2010). Tyler and Moench (2012) proposed that urban systems and adaptive governance are key pillars to the reduction of disaster risk in cities. Resilience is understood as an emergent feature of complex adaptive systems which comprise infrastructure networks, purposively engaged agents and institutions which structure human behaviour and interaction. Inter-scalar connections are central to complex adaptive systems: they explain cascades of indirect effects which can disrupt socio-technical networks essential for city functioning (da Silva et al. 2012). Furthermore, resilience at one scale and at one point in time may be achieved at the expense of resilience at other scales or in future time periods, which is a consideration highly relevant for the pursuit of urban sustainability (Chelleri et al. 2015).

The urban systems approach and resilience thinking have been further developed in the context of global environmental change and urban adaptive governance (David & Leck 2015). Common denominators of these interrelated fields are flexibility in the face of uncertainty and learning to experiment and to innovate (Silver et al. 2013; Castán Broto & Bulkeley 2013; Anguelovski et al. 2014). Adaptive governance seeks to integrate our understanding of cross-scalar interactions and a more inclusive and just urbanisation (Archer et al. 2016). Concern for social justice and equity are becoming central to discussions about urbanisation and urban risk (Shi et al. 2016; Matyas & Pelling 2015; McGranahan et al. 2016; Bulkeley et al. 2013).

2.2. Community-based disaster risk reduction and its challenges

Since the late 1980s, disaster management theory and practice have increasingly recognized the role of community participation in disaster risk reduction. One of the turning points in this debate was Andrew Maskrey's (1989) call to the NGO community and to disaster practitioners to acknowledge disaster victims and affected communities as active and resourceful agents in emergencies and in recovery. Underpinning his argument was the view of disasters as resulting from a combination of natural hazards and vulnerability, the latter resulting from particular social, economic, and political processes shaping the relative conditions and capacities of individuals and groups within distinct social structures (Romero Lankao & Qin 2011; Birkmann 2006; Blaikie, P., Cannon, T., Davis, I., Wisner 2003; Hewitt 1983; O'Keefe et al. 1976). The premise held that, if the root causes of vulnerability lay in the social, economic and political forces beyond an individual's or group's control, then all attempts at effectively reducing disaster risk had to involve actions to empower people. Paralleled by the rise of participatory approaches in the domain of international development (Chambers 1995; Chambers 1997), community-based disaster risk reduction (CB-DRR) was said to present combined benefits which could foster community empowerment. CB-DRR came to rely on participatory learning and action tools, aimed at genuinely addressing people's concerns and fostering conditions for solutions to reflect local knowledge and to value local skills and expertise (Twigg 2005). Through participatory methods, community members engaged in vulnerability and capacity assessment (VCA), their knowledge, experience and skills being paramount in the formulation and execution of suitable and sustainable solutions. Through participation, ownership of interventions was to further improve their sustainability and strengthen a community's technical and organisational capacities.

As an extension of participatory development theory and practice, CB-DRR was simultaneously subject to critical reviews on a number of fronts. The first domain

was an examination of the concept of community, power relations, accountability and therefore its contribution to risk governance. Second was its adeptness to truly address root causes of vulnerability in order to stimulate processes with the potential to lead to societal transformation (Cooke & Kothari 2001; Hickey & Mohan 2004; Dodman & Mitlin 2011; Twigg 2009). Successes and failures of CB-DRR have been linked to its capacity to generate community ownership and to alter pre-existing power relations, manifested in routine social and institutional relationships. In a critical retrospective of CB-DRR, Maskrey (2011) argued that partnerships between community actors and higher levels of government were essential to mediate between the different scales of action at which root causes, such as land ownership, needed to be addressed (Ferdinand et al. 2012). But this makes CB-DRR time-demanding and strenuous to sustain (Twigg 2015) and initiating partnerships can prove difficult for low-income community groups (Ferdinand et al. 2012). In a review of the outcomes of community-based disaster risk reduction projects in Latin America, Pelling (2011) showed that despite considerable efforts by a leading NGO to establish constructive and responsive relationships between community members, their leaders and local government, these efforts largely failed due to conflictual identity politics and inappropriately short project time frames which allowed little scope for addressing root causes of risk.

In CB-DRR, external actors take the role of facilitators and should value community members' knowledge and judgement, including that of a community's structure and internal power relations. Tseng (Tseng & Penning-Rowsell 2012) showed how within a declared participatory flood management initiative, expert-led stakeholder analysis failed to identify relevant key actors, which led to the intervention being marred by micro-politics and subsequent disengagement and disillusion of local community members.

In the context of community-based disaster preparedness projects, Allen (2006) discussed how project activities aimed at capacity-building and mobilisation of community members were met with disengagement by certain community actors

when project facilitators failed to account for inherent power relations and the political causes of vulnerability. There is a disadvantage of operationalizing communities as entities based on existing administrative identities, because internal polarisations inherent in pre-existing institutions can become accentuated through attempts at consensus-building and expose conflict over vested interests. Localised manifestations of distinct hazards may lead scholars and practitioners to conceive of communities as space-based undifferentiated units but defining communities as homogeneous and localised units underplays diversity for the sake of operational viability (Twigg 2005). Furthermore, addressing the root-causes of vulnerability requires that community-based risk reduction transcends space-based communities and includes focus on causes of local risk which operate at different spatial scales and through dislocated political processes extended beyond administrative boundaries (Hardoy et al. 2011; Dodman & Mitlin 2011).

Concepts of emergent groups and social capital have added to our understanding of collective behaviour in the face of disaster events and their impacts. Organisational sociology contributed to the understanding of community-based action focussing on group formation and organised action in response to and after disaster events. Stalling and Quarantelli (1985) described emergent groups as a capacity of members of the public to self-organise on a volunteer basis in largely informal social entities capable of intervening rapidly during and after emergency events. In high-income countries, these groups complement formal emergency organisations while in low-income countries they are often a substitute for formal civil protection bodies. Organisational emergence among citizens occurs over a variety of temporal scales: whereas groups which form during the response phase may be short lived, many evolve in later stages of reconstruction and recovery and take on initiatives such as housing advocacy, primary healthcare provision or betterment of local environmental conditions (Drabek & McEntire 2003; Drabek & McEntire 2002; Fothergill & Peek 2004; Enarson 2000; Fothergill 1996).

Community organisations are frequently considered as manifestations of positive social capital. The concept of social capital has been widely applied in order to study people's interactions which encourage or prohibit collective action during and after a disaster event. Many disaster scholars and practitioners adopted Putnam's (2000) work, which views social capital as the source of predominantly positive outcomes based on reciprocity and mutual trust produced across social networks. This implies that social capital stimulates mutual support and cooperation and both relies on and reinforces trust and common norms and rules (Adger 2003). A somewhat different understanding of the concept of social capital can be traced to Bourdieu (1986) for whom it constitutes a mechanism of social control based on obligations and expectations. It is through this mechanism that an individual or a group maximises the benefits drawn from a network (Portes 1998). This has led some scholars to call for caution, arguing that Putnam's legacy has led to a romantic view of the concept, over-emphasising its benign aspects and disregarding potentially harmful power relations (Aldrich 2011; DeFilippis 2002; DeFilippis 2001). An important aspect of Bourdieu's propositions about social capital is that, as any other capital, its production and acquisition is time consuming.

Social capital provided a significant sociological dimension to the study of risk management and adaptation to climate change (Adger 2003; Pelling & High 2005). Social exclusion, which is the lack of social capital, has been linked to increased vulnerability (Romero Lankao & Qin 2011; Klinenberg 2001). Along with growing interest in post-disaster recovery, social capital has been studied in relation to local capacity to overcome material and psychological difficulties associated with loss and extreme disturbance (Aldrich 2012; Hawkins & Maurer 2010). The study of social networks which developed from the 1970's provided a practical operationalisation of a person's or a group's relationships through bonding and bridging links, the latter comprising a further subcategory of linking (sometimes also referred to as institutional capital) (Burt 2004; Granovetter 1973).

Scholarly focus on urban social networks in African cities was initially developed through the work of anthropologists from the Anthropology department at Manchester university (Robinson 2006).[2] Although predating it, the work is closer to Bourdieu's conception of social capital. Between the late 1940s and 1970s, studies addressed questions of the distinct nature of African urban organisations and why it was necessary to conceptualise them as both linked to and equally distinct from rural organisations. The city came to be understood as a complex sphere composed of multiple social interactions which resulted in distinct social situations (Gluckman 1961; Mitchell 1983). In his work on social networks, Mitchell (1969) urged to focus on the analytical, rather than the metaphorical uses of the term 'network'. This put emphasis on structure/ morphology of a social network. Attributes of people (nodes) in a network became important, but more so were the interactional characteristics of the linkages in people's relationships. Whereas later developments in network analysis emphasized the morphology of networks, urban anthropology continued to focus on power and change in social relations and its manifestation in social situations (Glaeser 2006; Hannerz 1980).[3]

2.3. Gender and disasters

2.3.1. Gender and CB-DRR

The following section expands the discussion on community-based disaster risk reduction as a domain perpetually confronted with a reality which testifies to structural societal inequalities. Gender refers to socially constructed roles and subjective identities which shape individual and collective vulnerability and capacity to address hazards—that is the experiences, perceptions, needs and responses to hazards (Tobin-Gurley & Enarson 2013; Morrow & Enarson 1996; Fordham 1999; Bradshaw 2013; Dankelman & Jansen 2010). As a focussed application of the vulnerability approach, the principal proposition of a gender

[2] This broader group of scholars have also been referred to as the Manchester School.
[3] See literature review further below on urban sociality and ephemerality and opportunity in African cities.

perspective is that the relationship between women and men is based on structural inequalities (Chant 2013; Enarson & Phillips 2008; Phillips et al. 2009). This implies that opportunities and barriers are asymmetric and that the interests of some are represented and acted upon more than those of others. Enarson (1998) proposed three key questions to guide gender sensitive disaster research: how is gendered vulnerability constructed? How is the practice of disaster planning and response in households and organisations shaped by gender relations? How do gender relations evolve through the social experience of disasters? A gendered perspective on disaster risk reduction acknowledges that gender, intersected by age, is a key organising principle of social life. Inequality in production, reproduction and distribution of environmental harms and benefits translates into pressure on time, income, nutrition, health, social support networks, and knowledge (Dankelman & Jansen 2010). Morbidity and mortality during and following disaster events have been the most prominent indicators of gender inequality (Enarson, 1998; Finch, Emrich, & Cutter, 2010; Fothergill, 1996).

A gender perspective holds that gender is relational, dynamic and deeply political. Focus on diversity emphasises differences among men, boys, women, and girls as they are embedded in and interact through relationships of power, which are embodied in wider social organisation given one's status, wealth, age, class, religion, ethnicity, race and place. Tobin-Gurley and Enarson (2013) stressed that differential vulnerability requires attention to income generation, disability, violence, homelessness, single parenting, social isolation, minority or immigrant status, widowhood, and marginal and transitional sexualities. Women's social status, rights and material conditions as daughters, divorced women, single mothers or widows often imply a variety of vulnerabilities and strengths encapsulated in knowledge, skill, experiences or social networks. All these attributes and identities can be a source of solidarity but they can equally increase vulnerability due to social exclusion from formal or informal relief systems.

Individual and household actions to reduce risk take place within larger socio-political processes which carry their own ideologies embedded within sets of

institutions. Foley (2010) showed that decentralisation of Senegal's primary healthcare and its management through local community committees preserved social inequalities which further shaped women's experiences of larger socio-economic crises. The confluence of public, private and traditional health systems stretched women's financial and time resources, but had no impact on their say in household decision-making over health actions. Fredericks (2009) analysed participatory community waste management programme in Dakar (Senegal) and documented how municipal and NGO development programmes extended women's responsibility over domestic waste into the public domain, making them responsible for waste collection while providing no infrastructure support or remuneration; widows, whose social status was considered lower, represented a larger share of those involved in the programme. In Djenne (Mali), women were double taxed through a wastewater project, which was originally intended to reduce public health risks (Alderlieste & Langeveld 2005). Traditional buildings were being easily retrofitted with locally appropriate technology—a system of pipes and solid traps suitable for the infiltration of grey and brown water—signalling that environmental health risks caused by open sewage could be substantially lowered. Women, however, were tasked with cleaning of solid traps, which were placed in the street. Streets are traditionally viewed as the public sphere and women's involvement with waste and pollution in public is a taboo. Nonetheless, when these newly decentralised infiltration systems became clogged, the municipal authorities levied a fine to penalise households, and women in particular, who failed to clean the traps located at street level.

2.3.2. Gender and poverty studies

Literature on gender and poverty echoes concerns addressed by scholars concerned with the gendered nature of DRR. There is growing concern that the conventional view of poverty, including urban poverty in low-income neighbourhoods—which has been conceived as linked exclusively to income—has been largely inappropriate in informing policy. Income poverty has also detracted attention from the relationship between inequality, vulnerability and poverty (Finch et al. 2010; Bradshaw 2013; Chant 2010a) and diverts focus from

vulnerability stemming from lack of basic services (Mitlin & Satterthwaite 2014; Mitlin & Satterthwaite 2012) or the capacity to improve individual and household well-being through accumulation of assets (Moser & Stein 2011).

The concept of 'feminisation of poverty' has been widely adopted in poverty reduction policies and has had major implications for global labour structures and gendered division of labour. It has repercussions for how women's domestic and caring responsibilities, productive labour and community roles are viewed (Enarson, 1998). But scholars have argued that the approach has been flawed through misleading assumptions about the connection between women, poverty and female-headed households (Medeiros & Costa 2010; Brydon 2010; Chant 2010a). Instead, there is evidence of a much more worrying trend: over the past three decades, the range of women's responsibilities over household chores increased disproportionally compared to that of men's overall responsibilities (Chant 2010b). This concern has been echoed in disaster risk reduction (Bradshaw 2010). The key question, here, is 'why are certain needs and responsibilities seen as women's needs?' (Bradshaw 2013). The concept of 'time poverty' captures expectations placed on women's time and energy (Gammage 2010). Understanding how women's income-generating strategies are reshaped by disasters is important in the context of highly monetised urban living. Informal employment—in domestic services, street vending, home-based work or waste picking—is more likely to be available to women; it is often time and energy demanding, low pay, insecure and most prone to disruption during emergencies. For instance, after disaster events and during protracted crises, domestic work becomes often further discounted and taken for granted (Enarson 2000; Tacoli 2012).

Women's role in nurturing and child care intersects with other responsibilities, which positions women as income earners, food producers and consumers. It makes them highly susceptible to urban environmental degradation and lack of risk reducing services. Those responsible for food preparation, child care, cleaning and grooming face a daily burden of having to resolve issues of health (quality and

access to services), schooling, neighbourhood safety, impact of local environmental hazards on children and access to safe water (Tacoli & Satterthwaite 2013).

Food security is a central issue during protracted stress, presenting a long chain of difficulties for urban residents. West African countries have an excessively high dependency on global food markets (Resnick 2013; Moseley et al. 2010; Tacoli et al. 2013; Pozo-Vergnes 2014). Enormous resources are required on the part of those family members responsible for provision of food during periods of global emergencies and food price crises. Price hikes in local produce generally follow emergencies such as floods and channels for sales within urban areas became disrupted due to closed markets, inaccessible roads or government policing of street vending.

Women's social role as caregivers, particularly with regard to responsibility for children, has major implications for their vulnerability to disaster. Risk is further amplified for women living in poverty (Seager 2006). In high-income countries, cutbacks in school facilities or childcare support services have increased pressure on women's time occupied by childrearing responsibilities and have had proven impact on speed of recovery (Laska & Morrow 2007; Chamlee-Wright & Rothschild 2007). In many countries where formal childcare is virtually non-existent, arrangements within multi-generational households are crucial in allowing women-headed households to pool support. In Senegal, over one quarter of urban households are headed by women (Tacoli 2012). Studies from The Gambia, Philippines and Costa Rica which focused on the nexus between gender and poverty showed that in addition to their 'traditional' care responsibilities such as provision of food, health and hygiene, women cater for what used to be male responsibilities: children's clothes, shoes, schooling as well as rent (Chant 2010b). Elsewhere, a review of broader literature on gendered resource use within households, found that income controlled by mothers is more often spent on food, children's health, and education than income controlled by fathers (Sunderland et al. 2014). Securing resources for additional running expenses

considerably reduced time for rest and leisure, which in the long-term becomes harmful. Opportunity costs of many income earning strategies are high and prevent women from engaging in other longer-term risk reduction strategies such as accumulation of assets or investment in reciprocal favours (social capital). Finally, increased responsibility may contribute to women's decision-making power but there is no automatic link and women's social position depends on other factors such as household structure and a woman's position in a family life cycle. Following major flood events in Dakar, women's capacity to manage the breadth of responsibilities was stretched and risked being overwhelmed (Gueye 2009). Fragmentation of neighbourhoods and households caused a major disruption to women's emotional, social and economic lives.

2.3.3. Women's collective action

Feminist scholars have noted the need not to view women exclusively in terms of their reproductive and caring roles closely linked to the family. Likewise, a gender perspective on disaster risk reduction emphasises that social relations are dynamic and subject to change. In the context of disaster risk reduction this implies that gender roles are shaped through the different actors' mutual perceptions of and response to events. It further implies that disaster events and protracted crises create a context where some change in social relations may take place. Scholarship on formal and informal social and organisational networks in CB-DRR brought attention to community organisations' coalition-building and their demands for justice. Organising under the leadership of women is organising not around disasters and hazards but around key environmental issues related to food and nutrition, resources such as water and solid waste (Fordham 2009; Dankelman 2010). Furthermore, whereas during the 1990s, radical perspectives became diffused and reformulated through policy in terms of needs rather than interests and power relations, women's movements are essentially feminist movements as they address both the practical needs and strategic interests of women—both in terms of power and its material manifestations (Bradshaw 2013; Batliwala 2008). The political goals of women's movements are gendered and

their horizontal and collective leadership is reflected at all levels, drawing on women's own mobilising and negotiating capacities.

Coalition building—through which community groups, cooperatives and federations work with allies among the NGO sector, UN bodies and donors—has become an important component in the mobilising logic of movements of urban poor and women (Dankelman 2010; Mitlin et al. 2007). Detailing the experience of the Homeless People's Federation Philippines, Carcellar *et al*. (2011) showed how horizontal networks and alliances with other civil society actors lead to diverse forms of risk reduction. Through partnerships with NGOs and academia organised communities developed extensive information databases, tapped into flexible financial mechanisms and increased their technical capacity to plan for long-term interventions. This turned members of the federation into legitimate partners for local authorities, which amplified their opportunity for action when national policy took a turn from emergency response to risk reduction. Archer and Boonyabancha (2011) argued that disaster-affected communities needed to be given the autonomy to decide on criteria for external support. They stressed that flexible demand-driven mechanisms (including finance for individual households or collective revolving funds, rather than relief) allowed communities in numerous Asian cities to take advantage of major disaster events and to address issues of reconstruction and tenure security. Vital to this process was peer-to-peer support and knowledge sharing facilitated by community networks. There is increasing evidence that women draw important benefits from networking across community groups, cooperatives and federations. Through these they share risks and pool resources including knowledge, funds and political leverage. Networking methods include savings groups, local committees, documentation and community enumerations, peer learning exchanges, women leadership support, group-to-group technical assistance and partnerships with professionals, as well as regional communication and workshops. Applying these approaches are movements such as GROOTS and Shack/Slum Dwellers International (SDI), both of which are networks of grassroots organisations allied with international and national NGOs whose aim is to support urban poor in securing government

support for their own development programmes, be it settlement upgrading or acquisition of land for community resettlement (GROOTS 2007; Mitlin & Satterthwaite 2014). Finally, alongside important issues to be tackled, it has been noted that friendship is an important motive which brings individuals to come together and sustain organisations and social movements (Neal & Phillips 1990; Yonder et al. 2009; DCLG 2007).

2.4. Conceptualising and capturing associational life in African cities

2.4.1. African civil society

In this section I review literature on civil society in Africa. I then move to examine perspectives on urban sociality in African cities, paying attention to informal organisations and networks. Proponents of this perspective focus on informal and ephemeral social forms, which they see as central pillars of collective capacity to face uncertain environments and disjuncture inherent in everyday life. Organisations and social networks are conceptualised as vehicles for opportune encounters and channels for future moments of opportunity. Such interactions defy conventional causality and their outcomes are delayed and delocalised. A second part of this section provides an account of recent political history of Dakar, including a civil society movement in Dakar and an outline of select past interventions in participatory urban development planning.

Civil society is conventionally seen as political space between the state and the individual or the household. The idea of civil society has been epitomised in formal community organisations and associations, which were said to be characterised by altruism, autonomy, efficiency, capacity to cooperate, foster participation, transparency and empowerment (Igoe & Kelsall 2005). Furthermore, civil society has been imagined through formal voluntarist associations, which cross-cut vertical ties of kinship and patronage, thus echoing a modernist bias against kinship and ethnically constituted social actors (Lewis, 2002: 570).

Membership in networks, associations and other types of civil society organisations—whether formal or informal—is conventionally seen as based on properties which are ascribed or acquired. It has been largely assumed that ascription is the prevalent mechanism for organisational life in Africa, whereby kinship and ethnicity condition one's options and guide one's choices (Tostensen et al. 2001). Such associations range from local groups to global networks rooted in diasporas. Management style in organisations with ascribed membership is seen as largely based on traditional authority and patronage. From a normative point of view, this type of membership lacks the necessary voluntary nature and freely elected leadership (van Rooy 1998). Nevertheless, many have pointed out that this critique reflects a strong bias rooted in Eurocentric political culture, which introduces uneasiness over all partisan, parochial, fundamentalist forms of African associations. The same is true for distrust of kin-based and ethnic organization such as ethno-regional associations and movements, which are often of greater importance than horizontal organisations promoted by Western donors (Konings 2009). Bias against such organisations frequently prevails despite evidence that they are the driving forces behind political pressure groups using tradition to foster democracy (Mamdani 1995; Amadiume 1995; Comaroff & Comaroff 1999; van Rooy 1998). However, Roger and Vertovec (1995) pointed out that ethnicity defines only a fraction of personal roles; ascription, therefore, may be a characteristic of certain organisations, but in the everyday life of urban dwellers, it is only one of many logics guiding social interactions.

Organisations with acquired membership include religious groups, business collectives, class-based clubs, age-based groups, neighbourhood associations, but also networks and groups of friends; more than one such characteristic is often present in formal and informal organisations. In urban areas, self-help associations are frequently organised along class and occupational lines, which can coincide with location. For many interest-based organisations, gender and age are also often more important than ethnicity.

Finally, boundaries between formal and informal organisations are frequently blurred. This weakens the utility of any policy based on methods focused solely on tracking and quantifying formal membership in organisations. Formal membership in an organisation reveals only a fragment of the motivations, ambitions and activities of the members. Membership also captures only a fraction of effective members and supporters. This may be the case even when their contributions and involvement in collective activities is substantial: such as that of religious followers or supporters of social movements. Organisations with economic motivation are often excluded from definitions of what constitutes civil society and are therefore absent from formal counts. However, in many contexts, economic networks and associations evolved from important informal initiatives and intersect with other social networks.

2.4.2. Critiques of the concept in the African context

As a concept in political science, civil society refers to a modernist view of state-society relations. Ferguson's (2006) critique of civil society focused on the process through which the normative discourse of civil society replaced earlier discourses of nation-building in Africa and it became the sole pillar of a reworked framework of state-society relations. Within such a framework, democracy was conceived as making space for civil society whereas development was a project, the aim of which was to get the state out of the way for a new non-state sector to emerge.

In the context of Cold War and post-Cold War politics, civil society organisations came to stand for vehicles of long-desired proactive citizen engagement. Their creation and mobilisation was underpinned by calls for political plurality and grassroots-level democracy. Civic organisations were said to be endowed with greater legitimacy than corrupt government bodies. Macro-economic policies imposed through Structural Adjustment programmes served to promote NGOs and grassroots community organisation as means to address the failures of national governments and corrupt bureaucracies in delivering public goods and services. Civil society, buttressed by partnerships and good governance came to be heralded as a pathway of efficiently delivered development, thus ensuring that

a reformist view of development was to prevail over a more radical political engagement (Woolcock & Narayan 2000).

Ferguson refers to both the discourses of "top-down" and "bottom-up" development as myth-building and argues that while they are meant to appear standing in strict opposition to each other, they are mere variations of a structurally identical project where the corrupt, outdated, patrimonial and anti-change is replaced by the new, dynamic, emerging and progressive. In a critical reflection on the use of the term civil society in the African context, Comaroff and Comaroff (1999) argued that rather than a concept, civil society is a slippery idea, more rhetorical and programmatic than analytical and historical. Given that the idea fares no better when applied in its original European context, they consider unreasonable repeated attempts at a systematic assessment of the strength of civil society in Africa. Proponents who adopted a normative view of the concept use civil society as a Eurocentric index of accomplishment, which is mainly understood in terms of a distinct relationship between a pluralist state and the bourgeoisie actively seeking to safeguard and foster its economic interest. This automatically renders African local realities to appear as striking deviations.

An additional critique of the normative use of the concept holds that the concept has become highly prescriptive in ways which assume a universal relationship between the state and civic organisations (Lewis 2002). Prescriptive universalism is based on a Western model of state-society relations with three assumptions. Firstly, the model presupposes reliance on formal organisations and disregards the informal ones. Secondly, it imposes a clear distinction between the state and civic organisations. Finally, it equates the existence of formal civil society organisation with formal processes which would allow individuals to engage in formal rule-setting. These assumptions have become limitations which make the concept of civil society inappropriate and ineffective in capturing the reality and meaning embedded in African associational life. The assumption that a civil society acts as autonomous from the state has been critically addressed by scholars, proposing that analytical spotlights be focused on the relational nature

of the society and the state. For most part, civil society organisations in Africa have been seen as countervailing power to the state, acting either to legitimise or delegitimise it. But the analytical challenge has been not to view the relationship between civil society and the state as one of antagonism. The relationship is a continuum of interactions which stretch across situations ranging from total detachment, conflict, co-optation or mutual support and it is defined by a fluidity of resources, ideas and allegiances between organisations and individuals. Ferguson (2006) argued that the boundaries between the post-colonial African state and civil society organisations are highly porous because individuals and their networks permeate a variety of organisations. The existence of NGOs set up and operated by government staff makes us rethink the conventional state-society opposition and view the state as composed of practices that are very localised. But the converse is equally true: alternative pathways and connections have been formed by civil society members who, once in government positions, have taken full advantage of changes in administration in order to promote progressive agendas (Mitlin et al. 2007).

According to Maina (1998) a number of discursive factors have precluded inquiry into the co-option of civic organisations by the African state and elites. Widespread portrayal of African governments as 'failed governments' created a false image of their nature: 'political elites' became depersonalised abstract notions, showing passivity and disinterest towards citizen-led initiatives. In reality, however, the state never ceased to actively fragment and dissipate opposition, using civil society organisations as vehicles for its hegemonic project. Through his study of the historical and political factors which shaped civil society in Kenya, Maina (1998) opposed the general assumption that civil society organisations in Africa are voluntary, horizontal, self-organising and autonomous of the state. Formal associations had been routinely created and operated through state-controlled channels and historically, official procedures and regulations successfully restricted the existence and operations of subversive political organisations. This is particularly the case for organisations which were originally

embedded within colonial administrative systems and which were later refashioned to support party agendas and Structural Adjustment policies.

Contrary to formal organisations, it is the less exposed informal organisations which had been the more viable option for radical social and political agendas (Maina 1998). In particular, it is the informal self-help organisations and their activities and interactions which provide meaningful knowledge about African urban societies and associational life. Emphasising the political dimension of everyday civic life, he argued that – because they are founded on deep mistrust of the state – self-help organisations have always been deeply political. Informal organisations are also spaces where independent political leadership is fostered as they strive to co-exist independently of the state.

Two interconnected issues stand out from the above discussion of civil society. Firstly, it has been assumed that civil society organisations ought to be formal rather than informal entities. Whereas the choice is understandable for its practical advantages, it conceals the significance of processes of change put in motion by informal actors. Secondly, excluding informal organisations from the domain of civil society can only result in an inadequate and distorted understanding of political and relational processes which shape everyday social life. A political and social perspective on urban associational life thus places strong emphasis on social interaction through organisations and networks which fall in the sphere of informality.

2.4.3. Perspectives on informality, sociality, ephemerality and opportunity in African cities

Frequently equated with the 'slum' or the 'megacity', informality has been synonymous with poverty and marginality, variously dependent on distant sites of production and consumption (Roy 2005). Roy conceived of urban informality as a heuristic device, which serves to "deconstruct the very basis of state legitimacy and its various instruments" (2011:233). It is also a mode of production of space enacted within an unregulated domain structured through forms of extra-legal territoriality, which endow states and other urban actors with a high degree of

flexibility. From this perspective, rather than being a regulator of the political economy of urban development, the state becomes an entrepreneurial actor, negotiating and exploiting differentiated spatial value accrued through 'zones of exception' and 'grey spaces'. This logic can be applied to interventions such as forced evictions, slum upgrading, land titling and infrastructure development—many of which are closely linked to risk reduction policies.

Fourchard (2011a) cautioned that African cities can easily become subjected to an imposition of a romanticising, de-historicised and totalising version of the concept of informality. He framed informality as the processual and material manifestation of societal connections and contextualised it as an organising force of state building (Fourchard 2011a). By using a *longue durée* perspective, he highlighted the significance of time in shaping our understanding of informality. He examined the intricate linkages between political parties and informal business associations who operated public transport in Lagos significantly shaped the form of the city (Fourchard 2011b). Over time and across both the formal and the informal governance systems, powerful political actors and dominant institutions at multiple scales weaved webs of control over the urbanites' physical and economic realities. The emphasis here is on the lived fluidity of territorial, institutional and social entities in the precarious politics of Nigerian state-building. Fourchard's linking of informality and state-building poses a challenge to the traditional depiction of failed African states which are often portrayed as incommensurable with other world regions and their political processes.

Pratten's (2006) study of youth vigilante groups in urban Nigeria illustrated the challenge posed by informal organisations to conventional democratic norms, to the established social order and to state institutions traditionally based on generational domination. He used de Certeau's (1984) distinction between the tactics of the weak and the strategies of the powerful, to makes sense of moments of opportunity exploited by youth vigilante groups. Unable to exercise substantial power over the urban space, members of informal networks rely on timely tactical response to opportunity. Everyday practices underpinned

vernacular forms of governance: youth vigilante groups employed a repertoire of accountability, which ranged from implied or explicit violence and opportunistic redistribution of goods and services, to engaged political action such as "screening of political candidates, monitoring local government expenditure, checking the award of compensation payments to local chiefs, threatening contractors and para-statals to complete development programmes, and monitoring price controls" (Pratten 2006:710). Youth groups thus assumed responsibility for the protection and care of a community defined by specific spatial boundaries and through their acts of vigilance they blurred the boundaries of institutions representing the formal state.

In studies of urban life in Kinshasa, De Boeck and Plissart (2005) focused on the lived experiences of and meanings attributed to urbanity. Kinshasa's context is one of material and ontological insecurity intertwined with social and political crisis. The 'everyday' is based on discontinuities and disjuncture, material or institutional, which produce new forms of sociality. Discontinuities are omnipresent within patterns of urbanisation and in people's everyday uses of space, in inter-generational relations and in the everyday lived reality contested by imaginations of possible lives. Through De Boeck's ethnography of Kinshasa, the city is a site of politics and the young people's space for manifestations of an acute sense of disillusion with the urban world they inhabit. Processes of social change are played out through everyday conflict between family members, friends and between youth groups and formal authorities. The social and political crisis of Kinshasa matures into open intergenerational conflict (De Boeck, 2010). In its large informal settlements, these crises manifest themselves through dramatic changes in the ways funerals of deceased young men and women take place. They became occasions for the youth to seek revenge, revolt and publically blame the older generation, including the closest family members for the bleak prospects for a better life, for social disintegration and for the failed promises made by political elites. Whereas Kinshasa's urban struggles speak of a history of accumulated crises, but even in countries and cities with less turbulent histories,

youth politics are an important attribute of African urban life (Diouf 2003; Sommers 2010).

Simone's studies of African urban sociality engaged with informality through the prism of social form, epitomised in dynamic webs of ephemeral social formations constructed and employed to access livelihood opportunities in precarious ever-changing urban conditions (Simone 2001; Simone 2003). Much of people's participation in urban life and their everyday contribution to development takes place through informal events and ephemeral social networks. In Dakar, opulent social ceremonies such as baptisms and funerals allow people to build a capacity to master their urban condition: such social rituals preserve local solidarity, while at the same time, the occasions are carefully choreographed in order to create situations through which new personal and professional opportunities arise. The creation of future opportunities takes place through subtle signals in social interaction. This allows coping in the context of novelty, ephemerality and change, which characterises urban life (Simone 2001). Contingent and fleeting circulations and transactions are used by people to reinvent traditional social cohesion and to exploit, even just temporarily, highly unpredictable external opportunities. Fluid and malleable formations of people and things interact with formal institutions and in the process they constitute cities as future-orientated spaces of aspirations and expectations. It is the possibility of positive future outcomes of social interactions which guides actions in the present. In a study of Dakar's participatory urban development programme *Projet de Ville,* implemented in the second half of the 1990s, Simone reflected on the relationship between highly formalised, yet experimental, development planning projects and the myriad of openings for opportunity creation inherent in such formal initiatives. Through the project, youth associations extended their powers by demonstrating a capacity to form alliances with progressive local politicians. They also developed international partnerships which increased their leverage with local government, strengthening their role as legitimate urban agents. Simone positioned these highly organised yet flexible groups in stark opposition to other powerful neighbourhood institutions represented by elders and traditional leaders.

Simone's break with the binary opposition imposed on in/formality and his extension of the situationalist approach proposes alternative ways of appreciating African urban life and society. Rather than focussing on the suitability of policies, success of government programmes, or validity of existing institutions, one gains understanding of the city by appreciating the value of the ways in which collaborating individuals and collectives perpetually reconfigure the line between the formal and the informal, the present and the future, the world, the city, the neighbourhood and the urbanite. If an important characteristic of social life in African cities consists of ephemeral social forms which are constituted in ways so as to open windows of opportunity for a variety of informal economic activities, then the study of urban centres requires a conceptual approach which emphasise the relational and processual nature of cities. African cities are thus constructed as social sites for future opportunities created through unintended consequences of social encounters (interactions) and physical interventions (Simone 2004).

The following two sections conclude the review of literature by drawing the reader's attention to distinct historical processes which shaped the nature of and possibilities for community-based disaster risk reduction in greater Dakar.

2.5. Dakar's recent urban political history

The aim of the following section is to contextualize the study of Pikine's contemporary community-based organisations involved in risk reduction. The first part establishes a link between the case study and the above discussion about African civil society. It focuses on identity politics pursued by a civic movement formed by Dakar's neighbourhood-based community organisations. My objective is twofold: firstly, I acknowledge the influence of urban socio-political processes, which took place between the 1960s and the 1990s, well before the time period documented though my empirical research and analysed in the empirical chapters of this thesis (broadly 2005-2014). Secondly, I use this occasion to introduce the argument that a strong civic urban culture shapes the nature of Dakar's community organisations and that studies of urban CB-DRR can provide a productive venue to explore this relationship. The second part discusses a number

of formal interventions and initiatives in participatory urban development planning, which took place in Pikine and Guédiawaye between the late 1980s and 2000. The objective is to capture some features of an institutional and intellectual environment, which enabled the existence of formal and informal structures that facilitate sustained participation of community actors in urban development and risk reduction processes.

2.5.1. Evolution of an urban social movements in Dakar: youth organisations and neighbourhood movements

Dakar's urban youth

Organised resistance of groups of youth in response to co-optation, political capture (*encadrement*) and repression through which the state handled social movements constitutes an important chapter in the history of urban political action in Dakar (Diouf 1996).

Historically, the term civil society has been associated with political struggles defining late 18th century European Enlightenment, 19th century class struggle and 20th century post-colonial political changes, processes of Cold War political alignment and socio-economic changes linked to Structural Adjustment policies. Mamdani (1995) argued that when the genealogy of the concept of civil society is viewed through a lens of political history, it becomes necessary to distinguish between the role of class as having been the key mobilising cause for old social movements, and other forms of identity which brought together political communities to form women's movements, professional associations, or youth movements. Dakar's social movement falls in the second category. Examining the political and cultural history of Dakar's social movements, Diouf (1996) emphasised the importance of the 1980s and 1990s as formative years for urban civic organisations. Two groups of youth whose relationship with the state had previously widely differed both became part of a distinct political process. The first group comprised secondary school and university students, including high numbers of female students—they were periodically confronted with political co-optation. For this group, violent street protest became a principal means of

expression. The second group included the unemployed, rejects from the school system, destitute rural migrants, travelling merchants, unskilled workers and beggars—most of whom were socially marginalised youth facing routine brutal repression by state and municipal authorities. The official ideology at the time labelled these groups as human obstructions (fr. *encombrements humain*s) and portrayed them as socially maladaptive, deviant and economically helpless. They were blamed for disturbing the moral and aesthetic order of a modern city. This heterogeneous group frequently endured state-led violent campaigns and evictions.[4]

In 1988/89, following a presidential election which resulted in an extension of power of the Socialist Party, the disillusioned youth staged violent clashes in strategic public spaces.[5] Just as in previous demonstrations in 1968, 1969 and 1971, these events were the youth's response to authoritarianism and the government's attempts at political *encadrement,* which had led to periodic manipulation, exclusion and silencing of youth groups and their leaders (Diouf 1996). Not uncommon in the context of post-independence state building, government control was underpinned by a powerful nationalist historical discourse. The traditionalist discourse aimed to reinforce the legitimacy of traditional elders and religious authorities while references to nationalist memory drew on the writings of Senegal's first president L. S. Senghor, and more specifically his intellectual references to *negritude* (Diouf 1992).[6] Blurring the distinction between the holders of power and the masses, the discourse worked to reinforce "traditions of submission to authority and to elders, thus

[4] The novel *La Grève des Bàttu* (The Beggars' Strike) by Aminata Sow Fall (1979) is set in the context of state-led city beautification campaigns and raids targeted at beggars. In Dakar, these were a frequent occurrence in the early 1960s (immediate post-independence years) under Prime Min. Mamadou Dia.
[5] Socialist Party rule lasted since independence in 1960 until 2000.
[6] The ethnic Wolof identity of the *ndiggel* (the groundnut basin and base of the Mourides) is reinforced via its traditional elites who benefitted from pre-independence investment made in the groundnut business. This economic primacy was retained during the post-independence decades when groundnut remained Senegal's prime export article. In the 1980s and 1990s, the Mouride religious brotherhood, closely associated with the Wolof ethnic group, played an active part in student revolts and transformed from being seen as predominantly rural to an urban brotherhood. For the latter, it relied on university groups in Dakar and the development of its headquarters in Touba (with a population of over half a million, the settlement's status remains rural). The Tijan brotherhood is autochthonous to Dakar.

circumscribing a social and political space from which youth was radically excluded" (Diouf 1996:232). However, as such, it had become increasingly incompatible with the needs, experience and aspirations of the youth. The youth's revolt was also an open reaction against vilification by the media and popular leaders as well as against a publicly proclaimed crisis of traditional values. An ambition running deep within the movement was to challenge the traditional imperative of inter-generational subordination.[7] This fundamental political struggle of the youth, particularly the students, was initially manifested through a variety of political engagements, which ranged from violent street demonstrations, to organised support of opposition parties, to progressive demobilisation and defence of the students' standards of living and the quality of secondary and tertiary education. Nevertheless, disappointment, fragmentation and transformation of the movement accelerated with changes in party-politics and new government arrangements eventually obfuscated differences and interests in the Senegalese political landscape.[8] Disconnection from party politics and anti-traditionalist feelings became drivers in a transformation of youth from a volatile political actor into a civic urban movement called *Set Setal*.

In the late 1980s, youth under 25 years old constituted 65% of the city's population. Nevertheless, the government and its development policies paid marginal importance to this group and youth was viewed with suspicion (Diallo 1993). Repeated attempts were made in the following decades to design and promote institutions which would contain and structure the youth's activities. Youth was also largely excluded from legitimate power constellations: the increasingly authoritarian technocratic government of Prime Minister Abdou Diouf endorsed traditional hierarchies relying on social and generational elders.

[7] This issue relates both to men and women, although the public sphere and the public political domain is primarily a domain of young men. It also relates to a discussion on modernity.

[8] In 1981, a new multiparty system opened the public political arena to Marxist parties which had previously housed student opposition groups. This political diversity weakened and gradually expelled the students from the political realm. Likewise, soon after a contested election in 1988, the socialist party and its key political challenger (the Senegal's Democratic Party) formed a multi-party government, hence furnishing the youth yet another reason to demobilise and withdraw from the terrain of institutional and formal political organisations.

Liberalisation of key economic sectors, truncated social policy and rapid disappearance of employment opportunities in the public sector created an environment offering few future prospects for youth. Whereas dependency on social elders deepened, a new area of autonomy was created within the informal economy and its urban networks.[9] Rejection of the political status quo, rebellion against authority and intergenerational conflict thus came to shape young people's attitudes and actions extending from family to public relations.[10] *Set Setal*'s social, physical and aesthetic manifestations were thus a product of two combined states of consciousness: a rebellion against an imposed present, which dwelt too heavily on the past and a search for a future-oriented ideal, where future opportunities were pursued through self-actualisation in the present.

Set Setal, a symbolic framing of inclusion and pluralism in a an urban movement

Looking to place the movement through the prism of postcolonial urban sociology of the late 1990s, Diouf (1996) emphasised the need to break away from a dominant paradigm in which a rural reference encapsulated the idea of African life. He argued that key themes of colonial ethnology such as rural exodus, detribalisation or loss of authentic traits and values needed to make space for emerging logics of sociability (Diouf 1992), brought into sharp focus by widespread urban youth movements. *Set Setal* was one such movement: rebelling against prevailing socio-political arrangements, urban youth began a search for new poles of interest and developed alternative practices in identity-building, political and civic engagement and environmental activism. *Set Setal* translates as *Clean* and *Pure* where the two terms combined refer to moral cleanliness circumscribed within an orderly space (Diouf 1992). In 1990, following years of

[9] Issues concerning the employment of urban youth have been summarised by Le Bris and Chaveau (Le Bris & Chaveau 1992)

[10] Based on Senegalese law, 'youth' is defined by age: 35. This bracket is likely to be based on a traditional and hierarchical perception of seniority. Diouf (1996) states that while the youth played a crucial role in contesting authoritarianism, it had been subsequently swept by political elites upholding traditions of deference and submission between social and generational juniors and seniors. The wider age bracket designating 'youth' can also be perceived as an opportunity. Youth organisations are elaborate, well networked and resourceful, as exemplified by Gueye (Gueye 2001) in his study of Dakar university alumni organized in religious brotherhoods. Likewise, established links held by leaders of ASCs grant more leverage *vis a vis* local politicians and traditional elders.

corruption, political struggle and deteriorating living conditions, neighbourhood youth groups embarked on massive cleaning campaigns. These targeted primarily, although not exclusively, stagnant water and heaps of solid waste obstructing public space and aggravating people's health condition. Monsoon rains earlier in 1989 and 1990 measured above average in coastal central Senegal and resulted in extensive flooding as well as in temporary displacement and fragmentation of families within Dakar's suburbs.[11] A proclamation by a youth leader testifies to the emphasis on the movement's moral imperative: "This massive rain is a sign of purification, so we must clear our neighbourhoods, rid them of their recent memory and of existential dramas of all kinds" (Diallo 1993:211). Promotion of cleanliness and moral purity of the urban environment formed a counterpart to overt denial of colonial heritage and rejection of allegiances to refashioned traditional and political authorities.

As a movement, *Set Setal* developed through creation of new neighbourhood identities. It was vital that alternative references to space, time and aesthetics be created by the youth in order to mobilise those who had long been excluded from the political scene. Local neighbourhoods provided a spatial identity having neither colonial nor nationalist origins. Whereas some neighbourhood identities coalesced around autochthon Lebou villages, many others continued to grow into ethnically diverse units.[12] Narratives of local history were created in order to deconstruct the nationalist memory and to dispense with the official myth of development coupled with social justice (Diouf 1992). As a result, streets were renamed and local monuments were inaugurated, providing an opportunity to celebrate local 'heroes' such as football players or religious figures. High aesthetics promoted by the state became substituted by murals narrating private local memories and echoing local inhabitants' individual and collective symbols, ideals, concerns and determination. Traditional Ceddo art was revived in a stylised

[11] Diallo (1993) reports that more than 26 000 houses were impacted and a population of 350 000 persons was flooded. The floods trigger a major waste and sanitation crisis.

[12] The concept of urban neighbourhood thus refers to evolving social relations and periods when collective identities are inscribed in space. Neighbourhoods in Dakar are generally portrayed as multi-ethnic.

form through recycled and reassembled materials. Popular music connected neighbourhoods to fans around the world. Here too, the imperative of inclusion and pluralism was instrumental in experimenting with social change; artists were no longer defined through formal training or caste-based divisions in professional occupation. All were encouraged to exhibit local talent and ambition. Tactics in appropriation of space and of history operated through an intense re-socialisation and localization of local energy.

This overview of the *Set Setal* movement aimed to provide elements of a socio-political context in relation to literature on African civil society. In doing so I attempt to construct a nuanced understanding of Dakar's CBOs and their conception of politics and the community. CBO politics embody gender and intergenerational tensions as well as sensitivity to political co-optation of civil society organisations. Communities in urban Senegal are conceived not only through an identity rooted in the neighbourhood, but also in a broader sense encompassing diversity, plurality and autonomy. The following section focusses on formal urban development initiatives which, in their own ways, aimed to encourage Dakar's communities to further reclaim the city.

2.5.2. Recent experiments and initiatives in participatory urban development in greater Dakar

Guibbert and Abdoul (2005) argued that between the 1970s and 2005, there have been four distinct urban programmes which aimed to bring together the Senegalese state and local residents in an effort to improve the urban environment. The programmes and projects shaped the institutional context in which participatory development initiatives unfolded across the greater Dakar region, particularly in the peri-urban municipalities of Pikine and Guédiawaye, which comprise a vast majority of the city's low-income neighbourhoods. They identified a first period which they designated as experimental: it was shaped by a broad social vision and a belief in urban local sustainable development made possible through active engagement of citizens in public affairs. The hallmarks of this period included the search for a new society, enthusiasm for local autonomy

and revision of local policy-making. The second period saw changes in the characteristics of key actors, many of whom came to focus on strategic planning and project implementation. Despite an initially progressive agenda rooted in participatory planning, the momentum was lost to a technocratic and managerialist approach deprived of a greater vision and frequently oblivious of community actors. In the process, civil society organisations became increasingly dependent on external funding and many found themselves serving to legitimise procedures established by more powerful political and international actors.

Experimentation in Dakar's urban sustainable development

Projet de Ville (1994). Key partners of this initiative included the NGO Enda-Economie Populaire (ECOPOP), municipal authorities and international bilateral agencies.

In 1994, predating Senegal's decentralisation law, the programme entitled *Projet de Ville* was among the first urban initiatives in Senegal to highlight the value of partnerships between local communities, NGOs and local government authorities. The programme was led by a Senegalese NGO Enda Tiers Monde. Since its creation following the 1972 Stockholm Conference on the Human Environment, the organisation developed and engaged in sustainable development projects. Its philosophy and vision were underpinned by theories of eco-development and human development and were deeply inspired by the organisation's founder Jacques Bugnicourt, who was involved in the preparation of the Brundtland Report. With the support of development agencies, the aim of the NGO Enda was to promote participatory development and planning processes, acknowledging the importance of youth groups, cultural and sport associations, local development groups, economic association, women's groups and their federations (Soumare 2005).

Plan Development Local (1997). Key partners included NGO Enda-3D, Local Development Committees, local government at the level of *Commune d'Arrondissement* and bilateral donor agencies.

The second long-term urban initiative supported by Enda was a response to formal changes in state administration, initiated by the 1996 decentralisation law. Since 1997, the organisation supported the creation of Local Development Plans,[13] striving to capture new opportunities promised for citizen groups and locally elected government authorities at the lower level of the *Communes d'Arrondissement*. Local Development Plans were a formalised version of the earlier programme *Projet de Ville* with the hope that solutions would be found to prevent the widening gap between the local authorities' new duties and their meagre financial resources. NGOs, civic groups (voluntary organisations, associations and federations) and private sector actors have since been at the core of local development policy making, addressing on sanitation issues, health and education and decentralisation cooperation (Gaye et al. 2001). Nevertheless, despite Enda's growth and operations at the international level throughout the 1990s, its urban projects, including the Local Development Plans, failed to grow beyond neighbourhood level and their successes and failures echoed the political dynamics of election cycles and changing patronage relations.

Increasing focus on strategic planning and project management and implementation

Contract de Ville & Audit Urbain (1999). Key partners included the Municipal Development Agency (ADM), local governments, private sector, the World Bank.

The programme *Contrat de Ville,* was based on three-year long urban contracts initiated in 1997 through the creation of a para-statal Agency for Municipal Development (ADM). The agency was structured to encourage local governments to partner with private sector stakeholders engaging in strategic urban planning promoted by the World Bank. The programme relied on urban audits, including

[13] *Plan Development Local* (PDL)

"assessments of infrastructure and services, characteristics of urbanisation and documenting pockets of poverty."[14] The aim of the agency ADM has since been to support the decentralisation process across Senegal through funding allocations for local development projects. The key focus has been on public-private partnerships, management of local infrastructure works and technical assistance in the development of local governments' management and financial capacity. This new constellation of actors demarcated the role of local governments as technical and administrative nods operating within a broader landscape of powerful corporate actors (Doyle & McEachern 2008). Simultaneously, local community groups were increasingly encouraged to formalise and were perceived as market oriented competitive actors.

Local Agenda 21 for Guédiawaye (2004). Partners included local governments (LG), *Institut Africain de Gestion Urbaine* (IAGU), The United Nations Human Settlements programme (UN-HABITAT), the Association of Mayors of Senegal, Ministry of Planning and Ministry of Decentralisation and Local Governments, the Municipal Development Agency (ADM) and the European Commission.

The African Institute of Urban Management (IAGU), formed in 1987—the year of publication of the Brundtland report—with a remit to assist West and Central African municipal governments with technical support, information management, organisational and staff development in the domain of local urban sustainable development. The organisation further focussed on environmental and risk assessment, strategic planning, waste management tools and urban agriculture. Its role in Dakar's Local Agenda 21 (LA21) was to provide technical training to local government staff, documentation, administrative support and financial management of projects (IAGU 2005). Nevertheless, a number of documents and local commentators suggest that the community dimension of LA21 decreased through the managerial approach of project partners and some argue that LA21 became a failed technical exercise, a precondition for the disbursement of funds by international agencies (Wittmann 2010). The initiating brief of the formal

[14] Website of the Agence de Développement Municipal http://www.adm.sn - accessed on 03/06/2012

document *Appui à la formulation des Agendas 21 Locaux au Sénégal* which frames Senegal's LA21, identifies only the following stakeholders: local governments, UN-HABITAT, IAGU, the Ministries of Planning and Decentralisation, the Association of Mayors (IAGU 2004). Formal procedures for LA21 did include a provision for local committees, but records of a consultation which took place after IAGU's public presentation of the report *Profil Environnemental de la ville de Guédiawaye* (IAGU 2005) indicated that lack of community focus was an issue most regretted by the wider audience.

3. CASE STUDY BACKGROUND AND METHODOLOGY

3.1. Case study background

3.1.1. Demography and governance

Official data collected by the national statistical and demographic agency indicates that since at least 1976, the country has been perpetually urbanising. Population growth rates in Senegal's urban areas have been of 3.5% over the period 2002-2013, compared to a growth rate of 2.5% at the national level (ANSD 2014).

The geographical focus area of this research project is Pikine, one of four municipalities which constitute the metropolitan region of Dakar; the four municipalities include Dakar, Rufisque, Pikine and Guédiawaye. Based on the most recent national census undertaken in 2013, the population of Dakar metropolitan region is 3 137 196 inhabitants (ANSD 2015a) which, in 2013, equated to 23.2% of Senegal's overall population. Whereas Pikine and Guédiawaye are routinely referred to as Dakar's low-income peri-urban zones, or suburbs (fr. *la banlieu*) (GoS 2010), they constitute one half of the urban region's population. According to Senegal's national statistical office, the population in the four municipalities constituting Dakar's urban region was as follows (ANSD 2015b):

Dakar	1 146 052
Pikine	1 170 791
Guédiawaye	329 658
Rufisque	490 695

Senegal's predominant religion is Sufi Islam (96%). Its official language is French. Wolof is the language of Senegal's largest and culturally most dominant ethnic group—the Wolof. However, in everyday life, Wolof is spoken by a large majority of persons, including those from other ethno-linguistic groups such as the Diola, Mandingue, Pulaar, Sérère, Soninké and Arabic (ANSD 2014).[15] Despite being

[15] These are Senegal's other major ethnic groups with their respective national languages that have been homologised and codified.

characterised by high ethnic diversity, Wolof has become the principal language in Senegal's urban areas (GoS 2013).

Senegal's urban population is young. Compared to demographic data from rural zones, urban youth aged 20 to 35 years constitutes 33% of the population whereas in rural areas they account for 25% (ANSD 2014 RGPHAE rap final). Furthermore, data for the urban region of Dakar indicates an even greater presence of a young population: children and youth up to 35 years of age constitute 72.5% of the overall population.[16] Those younger than 20 years of age count for 44,5% and those aged 15-35 years constitute 39,7% of the total population (ANSD 2015b).

Households are large in Senegal, averaging 10 members in rural areas and 7-8 in urban areas (ANSD 2014). Almost 80% of households are headed by men, but of those headed by women over 70.2% are located in urban areas. Households with young women under 25 acting as heads of urban households with over 4 household members outnumber those headed by young men, which signals a disproportionate pressure on young women living in cities (ANSD 2014).

Literacy rates at primary and secondary school level have seen a positive evolution over a longer period of 30 years, but have been in decline over the past 15 years. Scholarisation rates for children over 6 years-old were 31,5% in 1988 and 59.2% in 2002, but then fell to 42.4% in 2013 (ANSD 2014). Scholarisation rates at secondary school level (children aged over 15) rose from 26.9% in 1988 to 52.1% in 2011 and then fell to 42.8% in 2013.

The demographic and health survey from 2012 (ANSD 2012) indicates that at the national scale some 49% or women living in urban areas have been unemployed of the period of 12 months preceding the survey whereas in Dakar the proportion was at 41.5%. The statistics show less difference for unemployed men where the national urban average is 19% and data for Dakar is 18.8% (ANSD 2012).

[16] Senegal's National Statistical Agency uses 35 as a cut off age for youth (GoS 2004).

Employment in Pikine is largely informal. A participatory diagnostic of Pikine undertaken by one of Senegal's largest local NGOs found that although there are over 40 industrial plants in Pikine specialising, among other, in food, chemical, paper or textile industry, they provide little employment for residents of Pikine. A large majority of jobs for locals are in the informal service sector including domains such as commerce, construction, carpentry, sowing, baking, tanneries, sport, music, community radios, car repair, transport and petty trade—most of which provide income for men (Enda Tiers Monde 2009). Select neighbourhoods at the sea side - original fishing villages - have maintained a fishing tradition, but there is a decrease in traditional/artisanal fishing activity.

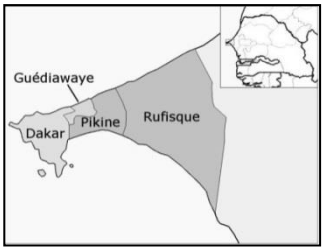
Women's income generation activities are to a large extent linked to sales at Pikine's markets (counting five central markets in Pikine, eleven neighbourhood markets and a couple of weekly markets). A substantial proportion of market products comes from urban gardening and rain-fed agriculture produced on sites in and around the city (this includes lettuce, green beans, chili pepper, tomatoes and mint, mil, ground nuts, corn, sorghum). Small-scale neighbourhood-level resale of fresh fish bought from wholesalers counts among women's frequent economic activities. Women's other important income-generating activity is the processing of fisheries and marine resources at facilities located on the sea side. Aviculture is a growing source of income and it is increasingly practiced at household-level.

Decentralisation and local governance: Pikine is composed of 16 communes (*Commune d'Arrondissement*).[17] Local representatives—mayor and council members—are elected both at the level of the municipality of Pikine (*Ville de Pikine*) and at the level of each of each of the communes. The last local government election took place in 2014; a standard term is five years. The competences of a local government are clustered in nine domains including,

[17] Since 1996, the legal framework for local governments is established in two laws: *Loi n° 96-06 du 22 mars 1996 portant Code des Collectivités locales; Loi n° 96-07 du 22 mars 1996 portant transfert de compétences aux régions, aux communes et aux communautés rurales*.

among other, environment, health, local development planning, spatial planning and urban management. At neighbourhood-level, neighbourhood chiefs—*délégués de quartier*—represent the deconcentrated arm of the state.[18] The title of a *délégués* is a life-long role into which a senior resident is consensually appointed by local residents (although subject to a formal election at neighbourhood level). Committees of elders are consulted on important issues and so are the religious leaders and the presidents (both men and women) of local development and professional associations, women's groups and their federations.

FIGURE 1: MAP OF THE REGION OF DAKAR AND AREAS FLOODED IN 2009
A/ MAP OF THE METROPOLITAN REGION OFDAKAR WITH THE FOUR MUNICIPALITIES DAKAR, RUFISQUE, PIKINE AND GUEDIAWAYE;
B/ MAP OF PIKINE AND GUEDIAWAYE SHOWING ZONES FLOODED IN 2009.
SOURCE: NEEDS ASSESSMENT REPORT ON FLOODING IN DAKAR (GOS 2009)

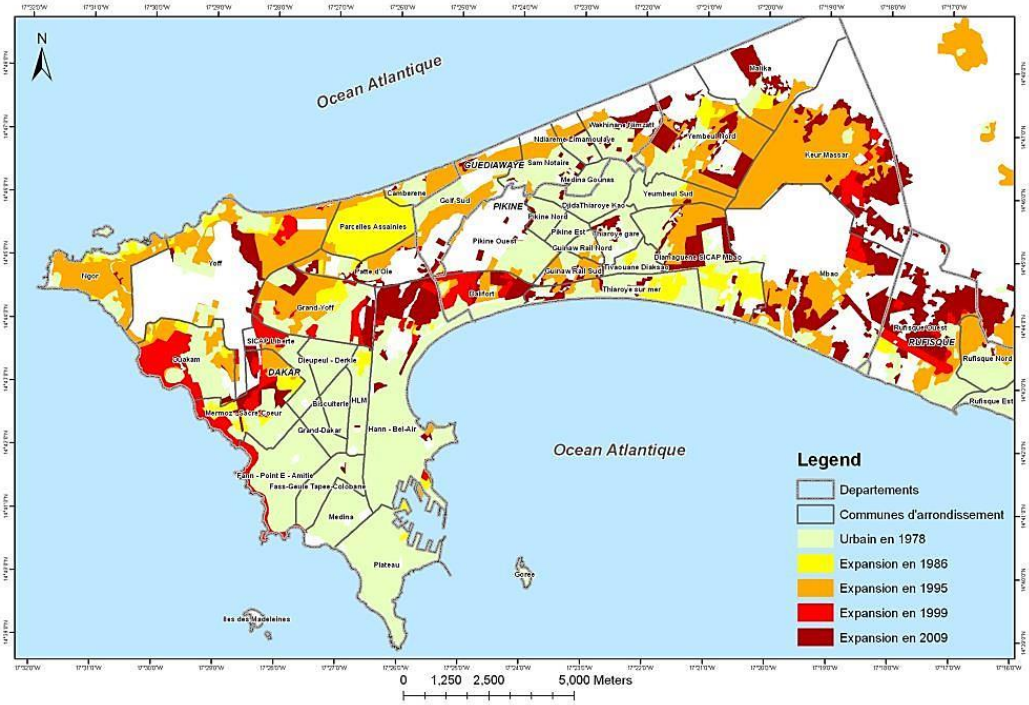


[18] A detailed discussion of this local-level urban actor is presented in chapter 7.

3.1.2. Pikine's origins

Dakar's location at the extremity of the peninsula of Cap Vert situates it on an elevated volcanic plateau. The legacy of its past function as a principal French colonial centre manifests itself through a highly formalised urban environment. Conversely, the origins of Pikine date back to the 1950s when traditional authorities from the *Lébou* autochthon ethnic group made land available for the rehousing of families evicted from colonial Dakar (Verniere 1977). In the first half of the 1970s, Pikine continued to be the main resettlement site for families officially evicted from popular neighbourhoods in the vicinity of Dakar's administrative quarters. During an extended regional drought from the early 1970s until the mid-1980s, Pikine's low-income informal neighbourhoods experienced an influx of rural migrants.

FIGURE 2: URBANISATION OF DAKAR 1978-2009
SOURCE: MAP BY THE JOINT RESEARCH CENTRE OF THE EUROPEAN COMMISSION
PUBLISHED IN THE NEEDS ASSESSMENT REPORT ON FLOODING IN DAKAR (GOS 2009)



3.1.3. Environmental conditions

The urban region of Dakar is a composite of bio-physical and social conditions shaped through climate and urban planning regimes. Due to the geophysical composition and topography of the Cap-Vert peninsula, the residents are confronted with distinct environmental threats.

Between 1947 and 2009, urbanisation of these zones increased from 16% to 55% (GoS 2010). The municipalities of Pikine and Guédiawaye are composed of ten water catchment zones. In Guédiawaye the terrain is predominantly hilly as urbanisation took place on a large littoral dune. Pikine maps onto low lying areas around the *Niayes*—a system of depressions, lakes and marshes in which groundwater reaches surface ground. Prior to its urbanisation, the site was known for its marshland.

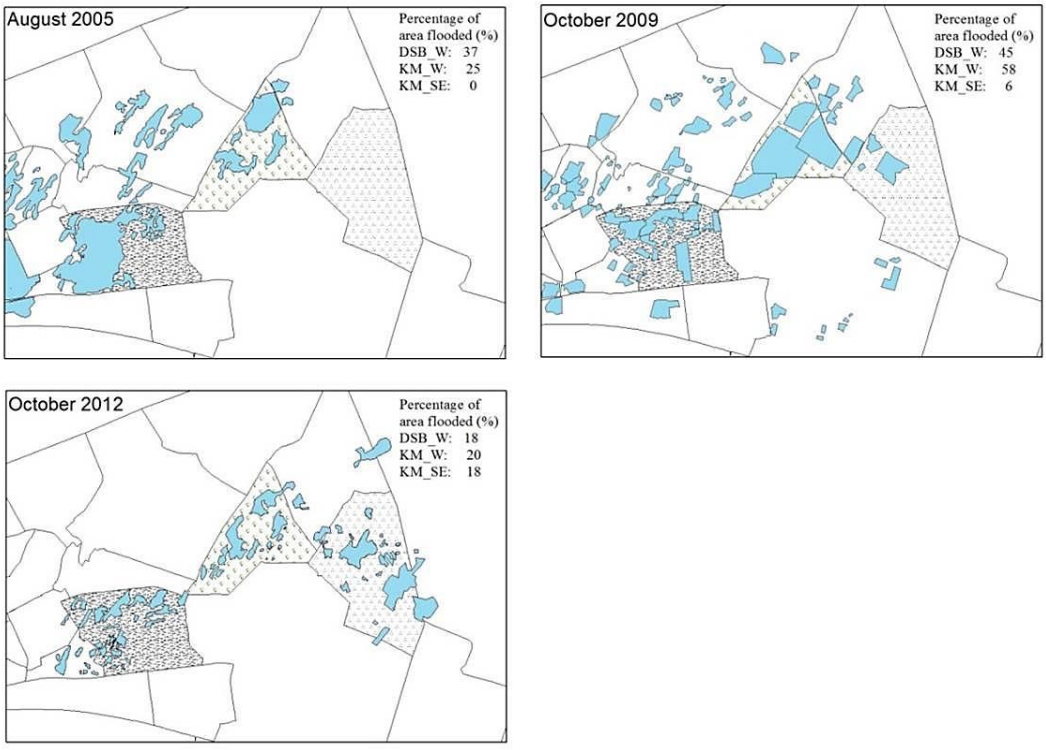
The two major environmental challenges in the region are coastal erosion and flooding (IAGU 2005). Coastal erosion is associated with sea level rise and illicit extraction of beach sand – a business which flourishes with the construction industry and the Pikinois' need to in-fill water logged areas. Seasonal flooding in Pikine has been attributed to a decreased permeability of soil caused by the increasingly dense built environment, which results in a channelling of rainwater and in its stagnation in numerous neighbourhoods. Long-term water-logging, locally referred to as surfacing groundwater, is a second most common challenge for local residents (GoS 2010).

Two major flood emergencies were recorded over the past four decades in the Sahel region: one in 1985 and the second in 2009 (UNEP 2011). However, at city scale, disasters caused by excess water have been more frequent than what has been acknowledged as international humanitarian emergencies. In Pikine, flooding of low lying urban areas started in the mid-1980s, the first major flood took place during the rainy season of 1989. However, August 2005 is remembered as the month when a threshold was reached in Pikine's socio-ecological system. Since then, countless low-income neighbourhoods in Pikine have suffered from chronic water-logging and severe periodic flooding, which can be triggered by

average seasonal rainfall. In August 2009 and late August 2012 two additional flood events brought disproportionate distress to the residents of Pikine (GoS 2014). Whereas neither of the rainy seasons was characterised by exceptional rainfall, both caused considerable loss and damage. From 2005, multiple built-up areas have become affected by three types of water-related threats: short term severe flooding during the summer rainy season (July-Sept), mid-term flooding lasting up to four months after the rainy season, and finally permanent waterlogging.

Digitised satellite images of areas affected by flooding in August 2005 and October 2009 testify to an extension of flooding eastwards, in the direction of the rapidly urbanising eastern edges of Pikine (GoS 2010). Images for October 2009 and October 2012 show residual flooding (waterlogging) at least one month after the rain. The maps were digitised manually from satellite images in the context of this EngD project.

FIGURE 3: PROGRESSION OF FLOODING IN PIKINE, YEARS (2005, 2009, 2012)
N.B.: PERCENTAGE OF FLOODED AREA IS CALCULATED FOR THE THREE COMMUNES ONLY. FLOODING BEYOND THE THREE COMMUNES IS DIGITISED ONLY FOR ILLUSTRATIVE PURPOSES.
SOURCE: DIGITISED FROM GOOGLE EARTH IMAGERY BY K.SOLTESOVA AND P. TENERELLI



At the time of data collection, the Post-disaster Needs Assessment Report on Flooding in Dakar (GoS 2010) was the sole comprehensive study detailing the context and impacts of major flooding in the summer of 2009. No such studies were available for the flood emergenciesof 2005 or 2012. According to the report, the peri-urban areas of Pikine and Guédiawaye were the most affected in the region of Dakar: in Pikine, 44% of the population were affected (360 000 persons) and 7.2% in Guédiawaye (22 000 persons).

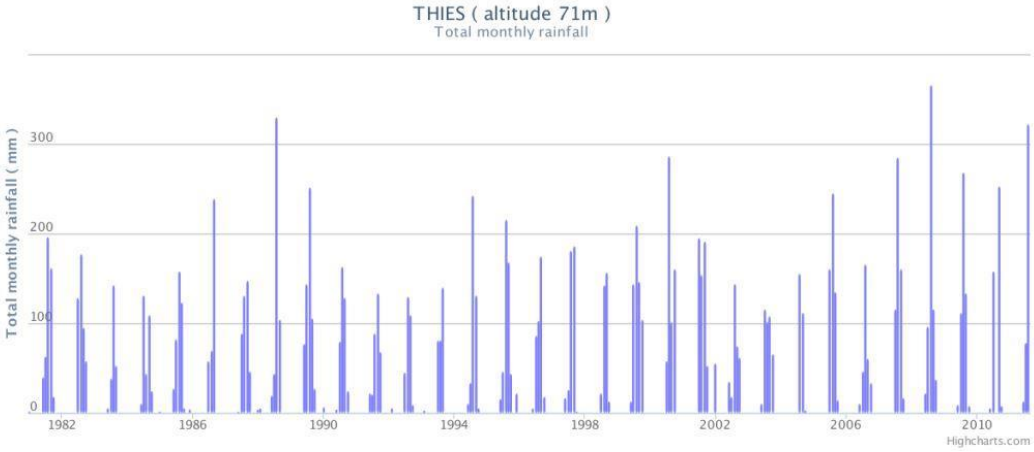
In Pikine and Guédiawaye together, 30 000 houses and 130 schools were inundated in 2009. Three months after the first floods in August, more than 800ha were still inundated, representing 12% of the surface of Pikine and 6% of Guédiawaye. Some 1500 properties became abandoned after the floods of 2009, which doubled the number of properties abandoned since 2005.

Loss and damage incurred by the population of Pikine and Guédiawaye in 2009 was estimated at 42 million USD; damage accounted for 18 billion FCFA (42 million USD) and loss for 17,3 billion FCFA (40 million USD) (GoS 2010). In these two municipalities, damage affected housing (61%), transport (11%), health facilities (10%), education facilities (7%), commerce and industry (7%). Losses concerned commerce (23%, mainly informal businesses), housing (18%), urban and community infrastructure (18%), energy (17%) and transport (16%).

3.1.4. Trends in rainfall vs. the political economy of waterlogging

Since 1990, regional meteorological records indicate a return to near-normal rainfall suggesting a prevalence of a multi-decadal dry episode (Fink, Kotthaus and Pohl 2012). Official climate models show no tendency of an excessively wet period (GoS 2010). Data from the Climate Information Portal (CIP) managed by the Climate System Analysis Group at University of Cape Town indicates rainfall peaks in 1989, 2001, 2005, 2009 and 2012, but these occurrences conform to standard seasonal variation.[19]

FIGURE 4: SENEGAL PLUVIOMETRY RECORDS
SOURCE: THE CLIMATE INFORMATION PORTAL (CIP) BY THE CLIMATE SYSTEM ANALYSIS GROUP, UNIVERSITY OF CAPE TOWN. ACCESSED ON 17.1.2015



Rather than seasonal rainfall, central to Pikine's flooding problem is the issue of high groundwater levels. However, the causes have not been broadly discussed in public and only a limited number of organisations have addressed the issue. In the first half of the 2000s, the use of Dakar's groundwater resources was gradually discontinued due to their excessive pollution. New infrastructure was built through a state-led programme, the Long Term Water Sector Project and a Public Private Partnership component was agreed to exploit a new source of drinking water for Dakar's region. Drinking water has since been channelled from Lake

[19] CIP deem pluviometry records for Dakar flawed and they instead use data for the city of Thies (inland, 56km from Dakar), stating that they are broadly representative of meteorological trend on coastal Senegal.

Guièrs, which is located over 200 km north of Dakar. During the same period, a major latrinisation programme was executed across Pikine. Individual sanitation remains the most prominent sanitary technology in Pikine; by 2008, only 4-5% of households were connected to sewage infrastructure (UN-HABITAT 2008). Retention of waste water in the ground thus started in the early 2000s and tipped the system in 2005 (USF 2009). These developments are said to have since been the cause of excessive groundwater, permanent waterlogging and more severe instances of seasonal flooding.

3.1.5. Government DRM policy

Senegal's national emergency management plan, *Le Plan National d'Organisation des Secours (ORSEC)* was adopted by presidential decree in 1999.[20] In 2002, a National Solidarity Fund[21] was established by decree to reinforce ORSEC by endowing local governments of water-affected communes with additional resources to procure motor pumps, protection wear and disinfection products (GoS 2010). Following the devastating flooding of 2005, the government set out to complement the national emergency management programme with a programme entitled *Le Plan Jaxaay, which* aimed to provide 3000 houses to cater for the needs of households affected by the 2005 flood event (Álvarez de Andrés et al. 2015). Four large water retention basins were also built across severely water-affected neighbourhoods from which residents had been formally and spontaneously resettled. Furthermore, the government envisaged to extend prior programmes in neighbourhood upgrading and linked upgrading projects to works on the construction of a future toll highway (GoS 2010). The latter was to trace across Pikine, connecting central Dakar with cities in Senegal's hinterland, attracting direct foreign investment. Simultaneously, it unlocked land on Pikine's eastern edges for private sector real-estate development.[22] In a 2008 response to the Hyogo Framework of Action, the government established a national platform for risk reduction. The aim of the platform was to allow for exchange among and

[20] *Plan d'Organisation des Secours* (ORSEC), decree n° 99-172, 4th March 1999
[21] *Le Fond de Solidarité Nationale* (FSN), decree n°2002-828. 19th August 2002
[22] *Zones d'Aménagement Concerté de Mbao*

coordination of diverse actors, including public authorities, civil society organisations and relevant state and supranational agencies. However, the platform, funded by the United Nations Development Programme, remained passive and by 2015 it was in need of full revitalisation (IFRC 2015). Finally, plans for an ambitious project for rainwater management and climate change adaptation—the *Projet de Gestion des Eaux Pluviales et d'Adaptation au Changement Climatique 2013 - 2017* (PROGEP)—included the preparation of a masterplan for storm water management and major structural measures to channel rain water into the sea.

By 2012, countless failures of the Jaxaay programme became evident. Intensive pumping in flood-affected neighbourhoods executed by the civil protection services had become inefficient and unreliable and the government came to face regular criticism. A new president Macky Sall took office in 2012 and announced a ten-year flood management program (2012-2022).[23] Central to the programme were works on drainage infrastructure planned through the state-led PROGEP project and rolled out from 2012 in four of Dakar's priority zones.[24] The above components of the official DRM policy are further detailed and analysed in chapters 4 to 7.

3.1.6. Typology of community organisations in Pikine

This sub-section presents a succinct overview of principal forms of community organisation in Pikine.

Women's groups (*Groupement de Promotion Féminine– GPF*) can be found in each neighbourhood. They focus mainly on economic activities, predominantly small business, traditional savings groups (*tontines*), micro-credit groups, artisanal activities and education (literacy and health education). Many have formed unions to ensure better access to local government and external donors.

[23] *Decade de lute contre les inondations (2012-2022)*
[24] These interventions are further developed in chapter 6.

Associations with economic interest (*Groupement d'Intérêt Economique–GIE*) have mixed membership of men and women, but they are often linked to women's initiatives in income generation. GIE led by youth are routinely engaged by municipalities to ensure waste collection and street cleaning. Women's groups, whether GPF or GIE generally count between 10 and 40 members.

Associations for local development (*Association pour le Développement du Quartier–ADQ*) are resident groups with the objective of ensuring local, neighbourhood-level order, cleanliness, public health and social development. They engage in a variety of activities including neighbourhood cleaning activities, sand removal, health awareness campaigns, literacy courses, box gardening and diverse solidarity initiatives. It is not infrequent for ADQs to formalise into GIE collectives in order to partner with municipalities in the sector of solid waste management. Since the 2005 flooding, there has been an increase in registered ADQs. ADQs have a smaller member base, but it is not unusual that passive and active members count between 30 to 50 persons.

Sport and culture associations (*Association Sportive et Culturelle–ASC*) are the most visible local community groups. From the 1950s, they coalesced around country-wide football championships, the "*navetanes*". These championships were organised during the summer rainy season, which corresponds with school holidays. ASCs went through periods of revolt challenging attempts to be controlled by the newly independent state in the 1960s and 1970s, followed by phases when they succumbed to institutional pressure and political co-option, to finally opt for professionalization and formalisation in the 1990s which opened avenues for the organisations' incorporation into formal national and international institutions and joint ventures with a multitude of state and non-state partners (Baller 2014). Volunteer young men are active members of ASCs whereas young women generally constitute the passive member base. The associations' primary focus remains the promotion and coordination of sport activities and lobbying for the development of public space designated for youth activities, the *espaces jeunes*. Their visibility at neighbourhood level is amplified by

their active involvement in *ad hoc* neighbourhood cleaning sessions and the extension of their activities into flood emergency response. ASCs are neighbourhood-wide organisations and therefore tend to quasi automatically include all local youth as their members.

The key characteristics of ASCs and ADQs include: front-line highly visible actors in disaster response; high organisational capacity and channels for information sharing; youth membership; spirit of volunteerism; strong solidarity spirit; tradition of inter-quartier and city level networking.

The following example is intended to provide a sense of local associational culture in Pikine. The *Commune d'Arrondissement* of Diamaguène Sicap Mbao has a population of some 126 000 inhabitants. In 2010, the commune counted the following legally registered civil society organisations: 21 women's groups (GPF), 20 associations with economic interest (GIE), one micro-finance group, eleven sport and culture associations (ASC), nine associations for local development (ADQ), and five smaller associations for disabled persons, neighbourhood representatives, young girls, health and for socio-educational purposes. Finally, three formal women's federations were registered in the area. At neighbourhood-level, the residents of Darou Salam (a neighbourhood studied during my preliminary fieldwork) are members of three associations: one for the promotion of women's interests (GPF), one for the development of the quartier (ADQ), and one for sports and culture (ASC).

3.2. Methodology

3.2.1. Theoretical underpinnings of the project and research questions

This research draws on literature which posits that community organising and development of formal and informal networks across multiple institutional scales lead to positive outcomes in urban local risk reduction. The vulnerability approach postulates that the capacity of people to make informed choices about their individual and collective future and to engage meaningfully in action is essential to their ability to minimise risk. Capacity of different groups and individuals varies based on their intrinsic characteristics and broader power structures, which shape their position within a society. This implies differentiated access to information, resources, or access to decision making. But people's capacity to face hazards and to decrease disaster risk evolves in time. Whether it increases or it becomes insufficient depends on multiple contextual factors.

Literature on community-based disaster risk reduction and on urban sociality in African cities testifies of the importance of community organising and of people's great capacity to weave personal and organisational networks, which act as an additional source in the development of individual or collective resilience. Networks and organisations have been conceptualised as a resource (capital), but also as forms of urban sociality which—through their propensity for emergence—carry the prospect of a future possibility and thus a relative betterment of one's conditions. Furthermore, networks provide an opportunity to create linkages across scales—temporal, institutional and spatial—which is highly relevant for our understanding of cities as complex socio-ecological and socio-technical systems.

African cities, and their low-income informal neighbourhoods in particular, are disproportionately at risk, both because poverty and infrastructural underinvestment create chronic exposure to hazards and because there is a limited institutional capacity to manage risk. Extensive risk is a principal concern in these urban areas. Over time, repeated hazards and urbanisation pressures shape the nature of extensive risk; in the process, its adverse impacts accumulate in a diffused manner and gradually erode the standards for what is deemed

acceptable risk. In this research project, rather than focusing on a unique disaster event, I examine an extended time period which provides scope for the study of a number of interrelated processes that shape the production of extensive risk.

This research project analyses data related to community-based risk interventions which took place over a decade. During this period the physical urban environment changed through the impacts of small-scale hazards and everyday disasters, through a number of large flood events and through sustained interventions by community organisations and the routine actions of local households. At a higher scale, state-led urban development projects inscribed additional changes into the physical and institutional environment of the studied neighbourhoods. In order to address the issues above and the connections between them, I ask the following principal question:

- How do periodic hazards and extensive risk shape social relations in African cities? The principal question is elaborated through four sub-questions:
- What are the social processes triggered by periodic hazards and by extensive risk in low-income urban areas?
- How do distinct forms of urban CB-DRR evolve in the context of periodic hazards and extensive urban risk?
- How do urban development pressures shape urban risk? How do interventions of other urban actors impact on CB-DRR?
- How are urban CB-DRR interventions embedded in existing local social and institutional relations? How are CB-DRR interventions socially produced? How do community actors use CB-DRR to negotiate local power relations?

These questions guide my empirical account of local conditions and collective action in low-income informal settlements in the municipality of Pikine. The four empirical chapters map broadly onto each of these questions. The aim is to produce findings which would advance current understanding of urban community-based disaster risk reduction.

3.2.2. Situational analysis and grounded theory

Situational analysis and grounded theory are the principal methodological grounds for this research.[25] Situational analysis underlies some of the key literature on African urban sociality. It provides an approach which allows the researcher to acknowledge the great variety and flexibility in people's actions while developing a critical understanding of the structural (higher level) elements which shape these actions. The origins of situational analysis and grounded theory trace back to the late 1950s when alternative approaches to structuralism developed among anthropologists. Situational analysis focuses on interactions and encounters. To be 'situated' means to face the power of social constraint. In other words, a *situation* refers to a moment of authenticity when one takes advantage of a circumstantial opening—an opportunity (Evens 2006). The openness of a situation is counterbalanced by the situated agent's response to this openness. Because it plays out the relative importance of structure and agency, situational analysis is often seen as a precursor to practice theory.

A social situation is also a temporal process and grasping it entails a focus on tacit principles which are lived and enacted. Such analysis includes focus on routines and strategies used by actors in order to achieve their goals. Failed performances, unexpected outcomes and crises are just as important as achievements in that they reflect a mismatch between an actor's bounded interpretation of a situation and external forces at play. Focus on situations of crisis, but not necessarily of conflict, also helps identify signals of tension, turning and contradiction, which indicate multiple possibilities (Kapferer 2006). The aim of such analysis is to understand the meaning given to situations – how people interpret and evaluate their options in relation to others and to the structural context. As fully developed in symbolic interactionism, the social is open-ended and renegotiated in everyday life. Clarke (2003:554), who uses situational analysis as an analytical approach central to grounded theory method, emphasised the importance of studying

[25] The term situational analysis is also used in the development sector designating needs assessment and/or institutional and policy analysis but my use of the term relates to a distinct methodology as outlined below.

negotiations which take place between actors and the "[…] major positions taken or not taken in the data *vis-à-vis* particular discursive axes of variation and difference, concern, and controversy surrounding complicated issues in the situation." Situational analysis has three main components (Mitchell 1983) and these align with the basis of ethnographic research:

A set of events – which are activities and behaviour worthwhile studying;
A situation – which is the meaning that actors give to events;
The setting – which is the structural context and may not be fully known to actors.

In the context of this research, I study events linked to activities of community-based organisations in distinct neighbourhoods of Pikine and the behaviour of their members as they relate to intensive and extensive risk—periodic flooding and phenomena associated with long-term waterlogging. This involves the study of discrete community actions, deliberations, negotiations, accounts of past disaster events or different actors' rationale for engagement with others. The structural context examined in this research consists primarily of major state-led interventions in the domain of urban development planning taking place at the scale of the city. Along with hazards, planning interventions alter the physical structure and texture of Pikine's neighbourhoods. Because interventions are implemented by government bodies who interact with local residents and their organisations, it is useful to view the structural context as outcomes of purposive engagement among diverse sets of actors. Some organisations may be excluded from actual face-to-face engagement, but they draw benefits through indirect connections made possible through social and organisational networks, which expand across temporary and institutional scales. Interactions between community actors and bodies at higher scales are therefore not linear and opportunities inherent in such relationships manifest over longer periods of time.

The above has implications for the constitution of a case. For Yin (2009), the very basis of a case study approach is that it is a systematic and holistic way to study contemporary phenomena within their real-life context, accounting for the

influence of context (setting). This definition of a case study echoes the main components of situational analysis. But delimiting the field through a situation is also an epistemological step, an acknowledgement of the impossibility of capturing a total way of life (Gluckman 1961). A situation is thus a way of "bringing together a diversity of dynamics and different processes without asserting that in reality they constitute an integrated unity" (Kapferer, 2006:131). In this sense, social network analysis was an important spin-off originating from situational analysis. Social network analysis can capture a series of specific situations affecting a given actor over an extended period of time, thus drawing closer to the real life complexity of the social world. A case can therefore consist of a multiplicity of events as long as the connections between them are relevant in explaining both the observed interactions between actors and the outcomes of these interactions. In this research, the case focusses on situations which relate to a distinct youth-based community group active in one neighbourhood. The characteristics of the community group and of the neighbourhood map onto broader categories and could thus be applied more broadly to community organisations across Dakar's urban region. Specific to this organisation is its direct engagement with other actors who are related to processes put in motion some 30 years ago.

The approach described so far implies the use of purposive sampling as practiced by proponents of grounded theory method. In this case, representativeness of a sample is not a precondition for the validity of research. Rather, purposive sampling reflects theoretical concerns which have emerged through ongoing analysis (Clarke 2003). For Charmaz (2008; 2014), the purpose of theoretical sampling is to elaborate and refine tentative categories, which emerged during cycles of analysis. Through iterative data analysis and data collection, emergent categories serve to identify further sampling directions.

During my early data collection and periodic analysis, I focused my sampling on community organisations in Pikine, active in the sphere of disaster risk reduction. These included a number of youth organisations and women's organisations.

Some of the broader data presented in the empirical chapters comes from this first stage of data collection. In my subsequent sampling I selected one youth organisation, primarily because it possessed deep understanding of and concern for local urban development and planning issues and it engaged with other urban actors touching on issues considered central to vulnerability – access to urban land. I undertook additional sampling half way through my fieldwork when an important segment of my data signalled the importance of upgrading programmes in shaping the discourse, visions and activities of many urban actors. This led to a data collection beyond the initial geographical zones capped by the youth organisation, extending across other parts of the city as well as across respondents representing actors within the government or among international organisations.

Constitution of a case and purposive sampling in grounded theory method are intimately linked to the analytic strategies of the method (Charmaz 2012). This comprises data coding from the start of data collection, memo writing and theoretical sampling. Situational maps, considered essential by Clarke (2003), were an additional tool used during my analysis. Such maps served to analyse relationships and engagement as well as explicit and hidden elements captured in the data.[26] Memoing at the end of an analytical mapping session allowed for new insights, shifts of emphasis or direction and detailing further data needs for theoretical sampling. As emphasised by Charmaz, the research process in "grounded theory method preserves an open-ended approach to studying the empirical world yet adds a rigor to ethnographic research by building systematic checks into both data collection and analysis" (2014:23). Tavory and Timmermans (2009) argue that the very reason why insistence on systematic data collection remains a priority in grounded theory is to ensure that pre-ordained theoretical positions do not guide data collection. Instead, researchers bring to the field their theoretical training (sensitising concepts) and methods and then let categories and eventual theories emerge from the data.

[26] Examples of a situational map and maps capturing some of the key categories of data are included in the Appendices.

It follows that an important aspect of the grounded theory method is its relationship to theory. Whereas both grounded theory and extended case method developed from the same methodological basis which originated with situational analysis, the two traditions developed a very different view of the role of theory. The emphasis in extended case method is on theoretically driven ethnography and reflexivity (Burawoy 1998) and its focus is on situated micro-dynamics (the empirical world) within macro-historical processes which are integral to the events (theory). Grounded theory begins with ethno-narratives extending outwards from every stage of the development of a case, only then to move into the realm of theory (Tavory & Timmermans 2009). As hinted in the discussion above, the difference between the two approaches is reflected in the way each constructs the analytical unit, the case: distinguishing between the theory-before-research model and the use of case studies to generate theory (Meyer 2001). Finally, the two approaches' differing view of the role of theory manifests in their conception of a narrative. Whereas in theory-driven approaches, the case is constituted through the theoretical narrative substantiated with ordered events, in grounded theory approach, the narrative emerges through the analysis of process, *i.e.* actions that are produced within social worlds and are perpetually renegotiated within social arenas.

3.2.3. Social roles as basis for agency in social situations

Power is an important aspect in studying and understanding social situations and their outcomes. Social situations, as documented and theorised through urban anthropology, form the backbone of urban life and they are products of dynamic relationships between peoples (Hannerz 1980; Simone 2004; De Boeck & Plissart 2005). Relationships are corroborated through behaviour.

People's involvement in situations has two important dimensions: consciousness and resources. Consciousness directs behaviour—and in turn, gets shaped by behaviour—whereas resources may be gained or lost. One's *role* refers to such purposive situational involvement. In practical terms, a social *role* may be closest to *behaviour*: what one does most, defines the role. But one's role does not

equate to status, because it allows a focus on negotiation, bargaining or battle (Hannerz 1980). In situations which require interaction (social situations), individuals assume roles. It follows that individuals operate within and create networks in which different relationships require different roles (Hannerz 1980). From this perspective, roles are not prescribed nor defined exclusively in normative terms, but they are purposive and flexible, depending on the nature of an interaction.

Relationships have two dimensions: normative control and the amount of personal information known to each other. Normative control is present in every society and changes are generally gradual. However, there are many ways in which individuals shape immediate response to information. Behaviour will differ depending on what actors know about each other. Significant information relates to personal attributes (ethnicity, sex, age) and other roles (other purposive situational involvement of a person). Based on this knowledge, behaviour towards each other will differ in three ways: the way others may or may not let an individual assume a certain role (*role access),* some may or may not be regarded as appropriate interlocutors (*relational access*) or interaction may be affected by the kind of information known about each other (*relational conduct*) (Hannerz 1980). These are principles of power in the organisation of social life. Ultimately, these are also reasons why individuals use roles rather than roles use individuals: crossing and manipulating, rather than accepting institutional boundaries. Across this study, the aim is to capture and understand not what people ought to do, but what they are actually doing, thus forcing attention on the discrepancies between normative prescriptions and everyday practices (Burawoy 1998). This focus permeates the four empirical chapters.

3.2.4. Research design

Qualitative research and data collection

In the context of this research, I collected and analysed qualitative data of which a large majority comes from field notes from participant observation and those from informal and semi-structured interviews. Grey literature produced by local

and national organisations as well as photographs taken during the fieldwork complement the data. Data collection took place in a phased manner consisting of a preliminary fieldwork of one month in June 2012, the main fieldwork of eight months between June 2014 and January 2015 and finally three post-fieldwork follow-up visits, lasting one month each in April 2015, February 2016 and May 2016.

The format of an EngD research degree requires collaboration between the researcher and the industrial partner/sponsor. My contribution to a collaborative action research project coordinated by my EngD industrial sponsor IIED and three partner organisations in Dakar, Kampala and Accra simultaneously served as a preliminary fieldwork, a prospection for the main fieldwork. In Dakar, the NGO Enda Energy (a team within the decentralised NGO Enda Tiers Monde) acted as the local partner organisation for this project. The project aimed to provide input for a deeper understanding of the assessment and reduction of vulnerability to climate change in low-income and informal settlements in the three African cities.27 Involvement in this collaborative project was of value to the EngD project for a number of reasons. It served as preliminary fieldwork, a 1st guided acquaintance with life in neighbourhoods the characteristics of which were similar to those I chose to study independently later, during my principal fieldwork. The project allowed me to learn from the findings of local research partners particularly with respect to principal hazards and their impacts in Pikine, aspects considered as contributing to the vulnerability of local residents and the broad lines of CBOs' most routine interventions. I was able to experience first-hand the

[27] The first objective of the project was to strengthen understanding of the environmental, socio-economic, cultural, institutional and political factors that shape vulnerability to climate change in sub-Saharan African cities, with a particular focus on informal settlements. The second objective was to build on this understanding of vulnerability in order to describe a framework for analysing climate change-related vulnerability that would be relevant for city authorities and for donor agencies when considering risk reduction, urban development, and infrastructure projects and programmes. My responsibilities included methodological support to Enda prior to the start of data collection, which involved coordination with partner CBOs in Pikine. I subsequently reviewed the first drafts of reports from the three countries and I co-drafted the final report. The final report of this project was published as (Dodman et al. 2015) by the French Development Agency.

internal workings of a local NGO which made me appreciate the operational challenges in local data collection and operationalisation of vulnerability. Some of these early experiences were echoed later during my collaboration with other NGOs and they are elaborated on in chapter 7.

The principal fieldwork for this study followed two years after the preliminary visit.[28] My collaboration with Enda, the initial local partner organisation, continued only briefly at the start of my main fieldwork: I volunteered to undertake a mid-term evaluation of a project focussed on coastal erosion and issues pertaining to municipal and community-based management of solid waste in three secondary coastal cities in Senegal. I was able to expand my understanding of hazards in Senegal's coastal urban areas other than Pikine as well as appreciate the overall trends in community-based initiatives supported by some the local leading NGOs. I undertook my principal fieldwork independently. Nevertheless, I benefited from friendly arrangements with a number of NGOs who agreed to my participation on their projects.

Additional one month-long visits in the field were scheduled in mid2015 and early 2016. They served to complete gaps in my data and to gain a deeper understanding of an ongoing initiative entitled 'the Park'. This project is analysed from various angles across the four empirical chapters. During my principal fieldwork I observed the development of the project from the perspective of the youth group whereas the additional visit to the field provided an occasion to engage more formally with the project: at a multi-day workshop organised by the donor INGO I acted as the interpreter (English/French) for the organisation and their African country offices who came together to exchange on their experiences of work with urban youth. I also assisted the organisation with a mid-term evaluation of a set of projects which focussed on youth-led urban design and inclusive governance in flood-affected neighbourhoods in Pikine, including my

[28] Although it was desirable that I dedicate over twelve months to the main fieldwork, this was not possible due to other EngD obligations which required that I return to London after eight months.

project of interest. Some of my notes from these engagements are quoted as data across the four empirical chapters.

During my third post-fieldwork visit I was invited to dedicate a month in order to coordinate a consortium of civil society partners in the conception and writing of a funding proposal for a new project which was designed to promote and strengthen CBO action in water-affected neighbourhoods in Pikine. This final engagement in the field was decidedly a deeply satisfying way of making the knowledge and skills which I acquired through the EngD process available to the communities of residents and professionals who had supported me during my research. Although highly insightful, elements of this engagement are not cites as field notes. Nevertheless, the experience has been invaluable in that it has allowed me to buttress my interpretation of multiple issues encountered in the field.

I was invited to participate in the Park project at various points in the project cycle and by the different stakeholders—CBO, local NGO, INGO—was highly valuable. I was able to vary my role of a researcher and thus gain access and collect data from multiple stakeholders. Being exposed to a variety of perspectives, I had the opportunity to appreciate the positions of the different actors and thus gain a better understanding of the subtleties of many situations. All of these engagements provided important contextual information. Most of these occasions were useful as they served to compare phenomena beyond the scope of the narrow lines of my fieldwork and all were invaluable for the insight they provided into the workings of organisations, their mutual relations and perspectives.

Summary of data collection methods

Preliminary fieldwork June and July 2012	# sessions / days
group discussions organised by NGOs and attended by CBO members	5
semi-structured interviews—with planning professionals, academics, and NGO staff	9
Principal fieldwork June 2014 to January 2015	
participant observation: project implementation / strategic meetings / events	9
participant observation: training sessions and FGD organised by NGOs	10
walking: site visits with informal interviews	19
focus group discussion session (FGD) organised by the author	5
semi-structured interviews - with technical and planning professionals, academics, NGO staff, local authorities and local residents	41
Additional visits in Pikine & Dakar April 2015; February 2016; May 2016	
consultancy / volunteering with local NGOs	38

Reflexivity and reliability in qualitative research

Validity in ethnography is pursued through reflexivity (Madden 2010; Burawoy 1998). Feminist reflexivity argues for partial truths which are conditioned by the researcher's persona. To be reflexive implies acknowledging that the researcher's social and political landscape (e.g. gender, nationality, race, religion, sexuality, dis/abilities, social class and social status) is an important factor which influences the research process. Furthermore, partial truths are believed to provide a more faithful representation of the world than what can be attempted as totalising representation.

Triangulation remains important in qualitative actor-oriented research, mainly because it provides means to shed additional light on actor roles and agendas. Reflexive research acknowledges that individual and collective agendas shape actors' perception and representation of reality, and that information is shared, retained and guided by social, ethical and political considerations. In the case of this research, triangulation was done by collecting multiple actor's perspective on

a given issue, date, event, by comparing verbal statements with the physical reality and by cross checking in existing grey literature and policy documents. Nevertheless, triangulation may require more time and access than may be available during fieldwork. In writing the final text, I thus opted to render the actor's position and perspectives as clear as possible. Finally, this research followed UCL ethics procedures. A proposal was submitted for assessment and it received the approval of UCL's ethics committee.

Key informants

The principal informants for this research were members of community organisations, counting youth neighbourhood development CBOs, women's saving's groups and sports associations. Local NGO staff constituted the second largest group of my interlocutors. Local government officials, technical staff at national agencies and professionals at international development organisations were consulted on specific issues, and I used most of such interviews to clarify topics brought up by CBO members, rather than to introduce new issues.

Establishing relationships with my informants allowed me to follow them during different types of events and encounters and return back to enquire about additional issues. Members of youth development CBOs and women's savings groups with whom I maintained most contact were 25- 40 years old.[29] All had lived most of their lives in the neighbourhoods which constituted my study locations. Their engagement in local development and risk reduction was well known to other residents and authorities, but it was not their primary activity as all practiced numerous income generating activities or were actively seeking employment.

[29] Senegal's National Statistical Agency uses 35 as a cut off age for youth Source: Gouvernement du Sénégal : Lettre de politique de Développement du Secteur Jeunesse, octobre 2004.

Language

I undertook the whole of the fieldwork in French. Along with French, Wolof is an official language in Senegal. I started learning Wolof with an audio-pack from SOAS library and continued with semi-formal classes in Dakar with a Wolof-activist, whose passion was to modernise traditional stories and promote reintroduction of Wolof as a teaching language in primary schools. My six weeks of such informal sessions were a unique occasion to gain deeper understanding on the cultural specificities of communication and interpersonal exchange in Senegal. I received invaluable advice for the early weeks of my fieldwork. Additional lessons which I took in Pikine were inextricably linked to my field: I prepaid a set of sessions with one of my early gate keepers who was short of capital to start a small-scale poultry business, a highly popular venture among residents of Pikine. Rather than being aimed at improving my linguistic skills, these sessions became an occasion to intrude into people's busy schedules.

Being unable to communicate in Wolof was an occasion to confront aspects of a social reality which I would not have paid attention to otherwise. Although speaking some Wolof seemed essential at first, I soon realised that it was a must, given that many middle-aged and older women spoke little to no French. However, this assumption proved wrong as I gradually understood that, for fear of being mocked when committing minor mistakes, women opted for silence in public. On many subsequent occasions, conversations in privacy became delightful exchanges despite the heavy subject of our discussions.

The use of French during workshops and training sessions organised by NGOs was possibly an important factor which made me opt for these events for participant observation. Nevertheless, as I learned towards the end of my fieldwork, the choice of language had been an issue for members of community groups as it implied an uncomfortable condition for participation: the use of French side-lined illiterate youth and made them appear as second class CBO members. Language thus became a reminder of the intricacies of both representation and of inclusion.

Field notes

Anthropological research relies on a broad set of data capturing tools: jottings taken immediately on site, the diary which captures a personal testimony of the experience of fieldwork, a log record to render data collection systematic and field notes which incorporate methodological, descriptive, and analytical issues (Emerson et al. 2011; Hammersley & Atkinson 2007). Early during my fieldwork, I often regretted not to have dedicated my career to transport planning, but my 90 minutes long journeys to and back from Pikine became valuable moments when I was able to use a tablet to sketch the most important observations and reflections. I used the notes in the following day(s) to complete my full field notes.

The principal data for this research consists of field notes documenting situations which I observed and discussions which I had with my informants. Most data cited in this thesis comes from informal interviews captured in my field notes; in text, it is therefore often referenced as 'discussions'. Quotes from recorded and transcribed interviews are referenced as 'interviews'. Notation in footnotes is shortened in the following way: Interview = Int.; discussion = Inf.int; focus group discussion = FGD; transect walk = walk; participant observation = Part. Obs.

3.3. Methods

Tools for qualitative data collection were used to capture specific nuances of the local environment, dynamics between local actors, details about problem definitions by individual actors, their motivation and choices (Bernard 2011). The two principal methods used for data collection were participant observation and semi-formal interviews. Walking was the third method employed during my fieldwork. Each of these methods is elaborated separately in the following sections.

3.3.1. Participant observation

One of the principal methods in ethnographic research is participant observation. It is a systematic way of looking at others and a deliberate form of association which is targeted instrumentally at gathering information. Its focus is the study of people in typical circumstances, *i.e.* social situations where people interact with each other in routine or ritualised ways, but nonetheless ways which are typical for that situation (Madden 2010).

Participant observation focuses on two domains: structural elements and behavioural elements. The former are aspects of a setting which affect human behaviour. Structural elements thus relate, among other, to the qualities and the nature of space where action takes place (*i.e.* un/accommodating all participants, order of seating, public/private domain, segregation in space, space belonging to individuals or organisations with specific social status, timing, *etc.*) or rules of participation (*i.e.* group membership, the presence/absence of some actors).[30] Behaviour itself has to be integrated into this physical and institutional context. The context of action in which one participates, also referred to as the setting, is therefore not only a physical location, but also a social construction. Different contexts require and impose different behaviour on all those taking part in a situation. Because the physical context is socially constructed, participant

[30] This was referred to above as *relational access*.

observation of people's behaviour in space provides valuable cues for interpretation.

Observing interaction in social situations provides information about social roles, relationships and the social structure. In social situations, people assume roles in order to pursue their goals and interests. Behaviour reflects people's positions and attitudes, performed through different social roles. Spatial relations such as social proximity, gestures, voices, or tools mediate communication. Participant observation shapes research as an iterative process: as the researcher gains tacit understanding of data, participant observation allows her to ask more pertinent questions and to establish subsequent themes of inquiry as well as a more structured data collection (Guest et al. 2013; Bernard 2011). Furthermore, the method helps to avoid suspect self-reported data, lessening reporting biases. I used participant observation in two principal ways: to observe situations related to the implementation of CB-DRR projects and to observe groups sessions organised by NGOs and attended by CBO members working on flood risk reduction.

Observing situations related to CB-DRR project implementation

Observation of project implementation, through strategic meetings, coordination reunions and project site visits allowed me to appreciate a spectrum of social interactions and institutional hierarchies at the neighbourhood level. The choice of collecting empirical data during strategic events organised by CBOs allowed for an analysis where relatively tidy events constituted space for negotiation (social arenas) between different types of actors (social worlds). The location of nearly all of these events differed, providing me with additional cues based on the social meaning of these settings (Silverman 2011). These events included CBO internal meetings to decide strategy (generally attended by 5- 10 persons), formal meetings between NGOs and neighbourhood authorities (up to 4 persons), work-in-progress and feedback meetings between CBOs and NGOs (up to 10 persons), as well as project presentations at the town hall (12 persons) and project presentations at international workshops (40 persons). Project implementation

events also included numerous site visits in the company of various actors, aimed at convincing, contending, presenting or simply confirming mutual engagement (generally attended by 5-10 persons). Finally, I participated in a planned community action, an all-day neighbourhood clean-up session, a *Set Setal,* attended by ca. 100 persons. All of these occasions were ideal settings not only to observe, but to engage my routine informants and new acquaintances in countless purposeful conversations.

Observing workshops and training sessions attended by CBO members

An important volume of my data comes from participant observation of training sessions organised by NGOs and attended by different constellations of CBOs. Among these training sessions I include project development sessions (two groups of 20 participants each), mid-term formative evaluation sessions (30 participants) and focus group discussions (three groups of 15-20 participants each). I analysed the latter along with data from two other focus group discussions which I organised before the start of the rainy season with groups of women residents in Pikine's water-affected neighbourhoods (two groups of 10 persons each). In one way or another, all of these events were linked to local CB-DRR initiatives and all took place after the rainy season, signalling sustained interest in local risk reduction. Most of the sessions were structured through participatory tools designed for the purpose of diagnosis, needs assessment and planning.

Walking: the experience, its utility and the methodological purpose

Walking is a quintessential part of urban ethnography and the imperative of walking the city precedes all other aspects of formal research and of analytical writing (Guyer 2011). Walking is a temporal as well as geographical process and it is linked to the sequence of one's narrative of discovery. It is essential to keep walking, fast or slow, to return over and over again to the same place and to criss-crossing entire landscapes, remaining attentive to the velocity of discovery which is given both by the rationale of a research design and by those who accompany us—gate keepers, interlocutors, or our own random encounters.

Transect walks are a favourite for early-on reconnaissance and for rapid assessment because they allow a better understanding of the environment, problem issues and on-site engagement with local community members (IFRC 2006). During my preliminary fieldwork, I undertook half a dozen transect walks in three different communes of Pikine consisting of: neighbourhoods where water retention ponds were built soon after the 2005 floods through a state-led emergency response plan which included rehousing of flood-affected households; a major state-built resettlement zone which allowed me to appreciate the rapid process of urbanisation triggered by major disaster events; and finally neighbourhoods affected by long-term permanent waterlogging. During different visits I was guided by young men and women members of three local youth associations active in emergency flood response.

During the main fieldwork, walking became one of me principal tools. *W*alking was my way of experiencing the environmental conditions and interventions which were at the centre of my interlocutors' lives and discourses. Through extensive walking, I appreciated phenomena which I would otherwise tend to over- or underestimate in their scale and scope. An essential component of walking was informal interviewing; walking in Pikine is intensely social. Walking in the company of local residents, community leaders or NGO staff, being shown an area the way they wish it to be seen, provided valuable contextual information both about my interlocutors and about those on our path. Frequent walks through neighbourhoods were also the most effective way to get a sense of ordinary life, witness unplanned events and be introduced to potential future informants (Bernard 2011). Spatial and material elements in neighbourhoods are the legacy of past phenomena and interventions. It was through repeated walks through selected environments and attention paid to materials, technology and spaces which stood out of the ordinary that I began to appreciate connections between the past and the present inscribed in the physical environment or different neighbourhoods. Finally, walking in the company of my interlocutors—or rather accompanying them on their way—was also a pragmatic choice. It allowed me to tap into people's busy schedules and establish less formal relationships.

During the hot summer months when indoor temperatures exceeded those outside, walking was often my rescue.

3.3.2. Interviewing

Semi-structured and informal interviews are indispensable in disaster research for they allow us to capture the invisible aspects of issues faced by survivors and vulnerable groups (Phillips et al. 2009; Tobin-Gurley & Enarson 2013). Interviews consist of a story and a discourse and they are therefore an opportunity to explore difference, inconsistency and meaning (Stroh 2000): whereas the story is the content, the discourse represents meaning given to the story by both the respondent and the interviewer (Denzin & Lincoln 2003). I used open-ended questions in order to address relationships among community actors and to enquire about ways in which choices were made. Furthermore, interviews were the essential method to gather data on residents' and professionals' views about the impacts of development programmes. I undertook 28 semi-structured interviews with individuals or groups of two counting:

- residents and neighbourhood authorities
- members of local community associations active in emergency flood response and neighbourhood development
- NGO staff members working on issues pertaining to risk reductions, urban development, decentralisation, participatory planning
- local government technical staff
- staff at national and international agencies with a mandate in urban development
- academic and urban development professionals

The respondents were identified through the process of theoretical sampling as described above in the discussion about grounded theory method. The average duration of an interview was 1h to 1h30. One third of my interviews were recorded and transcribed. For the remaining two thirds of my interview, it was not culturally appropriate to record. Some of my interlocutors refused to speak if

recorded. Such interviews were captured *ex post* in detailed field notes written as a purposive account of the conversations.

3.3.3. Other types of primary data

Other types of primary data consisted of material such as formal maps, community plans, fliers about community initiatives, internal NGO and CBO project reports, internal NGO project funding proposals, internal NGO-developed training manuals and tools for participatory learning and action (PLA) (40 items). In addition, I made photos of working material and outputs from workshops and meetings, which were generated primarily through participatory and visual methods. These included mind maps, material for pictorial analysis, problem trees, working versions of log frames and action plans (20 items). I also collected unpublished research material from researchers in Senegal (10 items). Finally, I made extensive use of outdoor images. Although I did not use photography as a method, I did use it systematically to deepen my understanding of the environment in which I worked. Each time I attended open air events, or I walked through a neighbourhood in the company of local residents, community leaders or CBO members, I handed my camera to a youth and asked that they photograph everything they deemed relevant. I did not ask the photographers to describe or analyse their shots, but I periodically reviewed these pictures in detail, identifying new elements and asking new questions. A different source of images was the facebook site of the youth CBO I most engaged with. Their photos from previous years posted online testified of the extent of seasonal flooding described to me by local residents. Pictures from previous CBO actions provided me with more detail about some of the techniques used by the CBO which I had not been able to see for myself. Most importantly, pictures from past events provided additional tacit understanding of these youth groups. They showed hard work, but also good fun and friendship. In many ways they add the warmth which had been lost through analysis. Some of these images are used further below as illustrations of my empirical data.

3.4. Fieldwork

The ethnographic field is both a mental construct and an embodied activity (Hammersley & Atkinson 2007). It is an intense period when the researcher explores two points of view: that of the participants (*emic*) and of the outsider (*etic*) (Gay y Blasco & Wardle 2007). These two perspectives are captured in field notes, which through series of translations come to form a final text.

3.4.1. The complexities of urban fieldwork

The following reflection about the complexities of urban fieldwork builds on select issues introduced in the discussion of literature on African cities. These include highly monetised and commoditised environments, high population densities, a young average age of the population, socio-economic diversity, institutional complexity and urban systems.

African cities are highly monetised environments and most of their residents are subject to intense and unpredictable schedules governed by multiple logics of income generation, which makes systematic data collection a challenging process. Informal economies and city form require that people spend a lot of time on the move reaching their workplace or searching for new opportunities—this being particularly true for the large proportion of young adults whose chances to find employment rely on social networks, personal contact and immediate availability.

In urban Senegal, traditions and local values require that one's social life be a priority. Symbolic moments and events such as death and collective bereavement frequently disturb people's scheduled commitments. For the researcher, this makes the creation of new contacts and their maintenance a task which requires flexibility and patience. The challenge of reaching and keeping in touch with respondents systematically is present even when meetings and events get scheduled in ways to fit everyone's busy schedules. Invitees are often unable to attend at the same time and as a result, important discussions and decision-making frequently takes place through *ad hoc* encounters—a mode difficult to plug into for the researcher. Ethical questions about intrusion into people's sparse

free time and their privacy become a sensitive issue all the more when the cultural background of the researcher and the respondents differs.

High population density, locked land, lack of basic infrastructure and resulting high cost of living are characteristics of African cities and together they produce low-income neighbourhoods, which are internally highly diverse in terms of the socio-economic status and professional experience of their residents. This phenomenon is well discernible for the population of young men and women but it is also present for older adult women. Awareness of this plurality requires attention to issues related to representation, both in terms of epistemology and political ecology. Chapter 7 touches upon this issue.

Cities are institutionally complex fields. African cities combine governance regimes, social hierarchies and technological solutions which are at once formal and informal, traditional and modern, local and international – although not all arrangements are the most appropriate or optimal ones. A multiplicity of actors and their initiatives, but also appropriation of initiatives by multiple actors as once makes it delicate and time-consuming for the researcher to appreciate the intricate and often covert linkages between actors, their resources (capitals), agendas and actions. This is particularly so in relation to risk, space and land use where a combination of institutional diversity and a densely built urban environment still based on regimes of informal land delivery are subject to immense development pressures. On different occasions, organisational plurality and institutional complexity manifests through very concrete situations: in many neighbourhoods, myriad actors have already quizzed local residents when collecting national statistics, baseline data for NGO projects, or enumeration data for urban development projects. Few of such engagements have provided benefits for low-income residents and some have even caused harm. In such contexts, data collection may become a stressful experience in an over-researched environment. Expectations management, empathy and a sense of ethics are necessary components of urban fieldwork.

Finally, the urban environment is a complex system and acknowledging it means that the researcher becomes sensitive to connections of various degrees and at multiple scales. The challenge for practice oriented research is to maintain a reasonably broad focus while selecting a series of pertinent subjects to be explored in depth. Grounded theory and purposive sampling allow a broad capture but it remains the researcher's responsibility not to get distracted. During the first half of my fieldwork I deliberately minimised input from authorities, professionals or other researchers. Instead, I sought contact with residents of low-income neighbourhoods and attempted to embrace their perspectives and follow their leads. The aim was to assemble lines of enquiry which would allow me to distil and maintain a reasonable affinity with their concerns across the overall research.

3.4.2. The contingent nature of research

Fieldwork is a contingent, non-linear process. Whereas this aspect is central to discovery, it may be demoralising on the day-to-day basis during fieldwork. Data from my preliminary visit in 2012 in collaboration with the local NGO Enda Tiers Monde led me to initially design my principal fieldwork to study the implications of seasonal rain. I expected seasonal rain to cause flooding on a yearly basis and a large part of the population to suffer from severe waterlogging inside their houses for over four months after a rainy season. I was prepared to study the impacts of such mid-term waterlogging, but the rainy season of my fieldwork turned out to be dry which made it impossible to observe and study phenomena in a linear fashion before, during and after a flood event. This twist became an occasion to refocus my attention on the long-term process of urban risk production and the sustained initiatives to reduce it.

Daily uncertainty was the most prominent feature of my fieldwork. I fast learned that it was psychologically damaging to rely on my agenda prepared for the day. Meetings would be cancelled at the last second, or take place hours after the scheduled time. But new introductions would follow just as rapidly. I got used to idle days and marathon days when meetings, interviews, and visits seemed never

ending. Religious and civil holidays would extend periods of everyone's unavailability and seemed to relegate into oblivion concerns which I had assumed to be central to my respondents' lives. At one point I woke up with a realisation that I would never again in my life take personally a cancellation or a 'no show'. The methodological implications of this *modus operandi* were subtle: my understanding of the local context grew faster than the volume of my systematically collected data on people's actions.

3.4.3. Accessing the field

Access is not only a matter of physical presence or absence: different rules and norms guide presence in different spaces. Access to the field is shaped by the researcher's social role and accessing the field is a sustained activity, rarely limited to the first weeks or months of fieldwork. Field relations and the role of the researcher evolve through her own engagement in social situations. Through social engagement in the field, the researcher is part of a social construction of power as described by Hannerz (1980): the researcher's personal attributes such as age, gender, being a foreigner and her other purposive situational involvement (other roles) are continually subject to scrutiny and shape access (Emerson et al. 2011).

Throughout my fieldwork, reading my own emotions was a way to make sense of my relationships with my interlocutors and the discrepancy between how I and my interlocutors interpreted my role: joy, relief, discomfort, fear, excitement, resentment were often signs that my self-perception differed from the way I was being perceived by my interlocutors.

Accessing the field is a process in which two factors play an important role: gate keepers and timing. Gate keepers make early orientation and encounters not only easier, but also more meaningful to the researcher and more comprehensible to the interlocutors. But gate keepers themselves operate in a social environment in which they perform distinct social roles, and they are thus subject to perceptions, expectations and relative access to other social actors and their knowledge. For the researcher, this implies a need for additional conscious filtering of

information, attitudes and expectations. My gate keepers were predominantly NGO staff members, distinct residents and community development agents. In the second half of my fieldwork, a natural progression of events meant that I lost touch with all of my initial gate keepers and instead I coordinated with a number of residents who had become friends. A few personal notes in my diary testify to the need for establishing friendly relations to cushion stress arising from my interlocutors' expectation and from my periodic realisation that I am unable to substantially alter the lives of my respondents.

Building and maintaining rapport with interlocutors is central to qualitative research. My concerns and my relationships changed as I became familiar with some of the routines within the field and when my repeated presence and engagement in projects opened new roles for me to assume and explore. I was able to rely on friendly relations and share some of my participants' daily activities, although unceasingly asking for clarifications. However, all through the fieldwork, I could never be certain that I would be invited to participate in meetings during which different parties negotiated their proposals, elders instructed youth about institutional processes and long discussions were held about ways to approach a particular actor. My daily morning routine thus consisted of half a dozen phone calls to enquire about the day's events while unscrupulously asking to be invited. To compensate, I endeavoured to discretely share information with those whom I felt I could help advance their actions in constructive ways. In so doing, I perhaps kept a balance on a fence between extractive and action research.

3.4.4. Timing of data collection

Classical ethnographic research envisaged sustained data collection to take place over long periods of time. But spending extended blocks of time doing fieldwork is not always a viable option. Fully immersion in the field is also recommended, but after I had made initial efforts to find accommodation in Pikine, this option became less viable after the first two months in Dakar. Identifying a case location took longer than anticipated and by the time I settled on my primary case in

Pikine's commune of Diamaguène Sicap Mbao, I had opted to commute, rather than search for housing in the area. This decision affected the choice of events which I was later able to include in the study: I opted for events and processes structured through the life of local organisations. Participant observation of events charting the progression of a youth community project allowed me to experience the speed at which local initiatives come to life: long days of waiting and deliberation were interspersed with flashes of green light when important decisions were taken in unexpected moments. I came to appreciate the patience of local residents as well as their capacity to get mobilised and act on situational openings. Nevertheless, this choice of engagement prevented me from being able to assist in impromptu meetings organised in the evenings or account for the details of mundane life.

In studies of social processes related to nature's cyclical phenomena, the timing of research is paramount. Attention to time is important when 'sampling' within a case because attitudes and activities vary over time and their capture allows for holistic research. Sampling throughout the day, week, season, is also necessary – in many cases sampling is based on the rhythm of people's activities. Special occasions such as festivals and ceremonies are important temporal markers guiding collective activities. Sampling should also allow for adequate time for recoding of data (Hammersley & Atkinson 2007).

My fieldwork in Pikine started in May 2014, which contributed to an initial ambiguity about my role. I had planned to start fieldwork a few months prior to the start of the rainy season in order to identify actors involved in preparedness actions engaged in preparation, and document their actions and relationships. What I had not anticipated was that my interlocutors, who during this first phase of fieldwork consisted almost exclusively of local residents and community leaders, would automatically label me as an under-cover humanitarian agent on a mission to identify future beneficiaries. No matter how much I varied my questions, most of my early informal interviews, transect walks and even focus group discussions with local residents felt staged. I was later told that numerous

NGOs used a strategy of unannounced home visits to enlist beneficiaries. These experiences became increasingly distressing and they eventually brought me to change my data collection strategy. In the second half of my fieldwork, I followed in real time the planning and implementation of a community DRR project. This allowed me to anchor my interviews around ongoing concerns and map them onto the network of actors involved in the initiative.

Data collection during my fieldwork was equally influenced by political and religious calendars. Political campaigns and religious holidays perturbed my plans on countless occasions as they rendered my interlocutors unavailable, but these moments served as occasions to remind me that my daily preoccupation with water, risk, community actions, projects and policies were not subjects that made people tick. June 2014 was dedicated to all things political and it culminated in municipal elections which took place at the end of the month. Many of my informants, who commonly maintained that they were apolitical agents dedicated to local development, were unavailable, each having a role in local campaigning. I was amused when a transect walk in the company of local residents turned into door-to-door campaigning. On another occasion, a community leader whom I was to shadow for a day cancelled door-to-door visits, which were originally aimed to recruit households for a sanitation project, because he was concerned that it would overly politicise the initiative. During this period, I organised two focus group discussions with women living in two water-affected neighbourhoods; both events turned out awkward not only because my assistants-interpreters opted for silence in the presence of their elders, but also because many participants associated the meeting with election campaigning. The following month, preceding the conventional start of a rainy season was slow: after the election, newly elected municipal representatives and their administrators took two months to get officially sworn in and to settle into their new roles, temporarily stalling community projects which sought alignment with local government priorities.

July 2014 coincided with the month of Ramadan and its closing festivity the *Corite*. Community drainage coordination meetings were postponed until after the holiday, which—given the imminence of the rainy season—seemed to me extravagantly unreasonable. Other religious holidays in October and in early December took me by surprise, not because I had not factored them in my planning, but because I underestimated the number of days covered by the notion of a single holiday.

During the rainy season of 2014, Senegal recorded minimal rainfall and its impact was negligible compared to every-day small-scale hazards experienced daily by residents of Pikine's low-income neighbourhoods. My plans to follow local response during the rainy season no longer held, but I was greatly relieved for the sake of all my new acquaintances and those whom I was yet to meet.

3.4.5. Research in a politicised environment

Researching an environment where organisations compete for resources and legitimacy and where they engage in often socially delicate development initiatives inevitably puts the researcher in an environment permeated with everyday politics. Most situations which made this aspect evident in my own research revolved around access to information.

For instance, in a number of interviews with NGO management staff working with state agencies, my interlocutors came across as distrustful and evasive on issues pertaining to their involvement in certain interventions. Only months later did I find out that my interviews had coincided with public protests against these very interventions.

On other occasions, I took the blame for all researchers who failed to contribute to the amelioration of the lives of Pikine's residents and walked away feeling humiliated and offended. I also resented having missed various events as I endeavoured keeping in touch with organisations and individuals across different communes. It was not until a member of a youth organisation—whom I had thought very well informed—confessed to similar frustrations, that I understood

to what extent information about sensitive interventions was only available to a narrow circle of actors.

Finally, relationships between organisations were equally concealed, which made it difficult to predict or even understand the conditions for their alignment or conflict. This struck me in particular when many months into my fieldwork, I learnt that two NGOs whom I—and many members of local youth CBOs—had thought to be antagonistic, were in fact collaborating; their two projects being two components funded through a common source. In this specific case, I took this information into account when analysing and discussing some of the empirical data, but the incident made me highly conscious of the contingency of both the research process and its implications for the findings.

3.5. Analysis tools and coding

The principal approach used to analyse and interpret data included in this study was grounded theory. The analysis focused on data primarily in the form field notes, complemented by that of interviews and a limited number of policy documents. Using qualitative data analysis software Altas allowed for an inductive approach to analysis (Friese 2012).

The first round of coding consisted of line-by-line narrative codes focused on action (Charmaz 2014). The second, conceptual round of coding accounted for actants – both human and non-human, types of activity and discourse. These codes provided additional input for analysis and were used to construct situational and positional maps, which, among other, helped capturing and interpreting apparent conflict, tension and dichotomy. I drew on Clarke (2003) who proposed three types of mapping analysis tools: situational, social worlds and positional maps. S*ituational maps* bring together a first relational analysis of human, non-human, discursive and other elements, which are components of a situation. Clarke and Friese (2010) suggested that people's individual or collective practices constitute important elements of these maps and Emerson *et al.* (2011) called attention to the ordinary and to people's everyday routines, rather than the

dramatic and the exceptional. S*ocial worlds* maps lay out collective actors with their agendas and interpretations of situations. *Positional maps* explore variation, difference and controversy surrounding an issue in the situation.[31] Complementing the maps, I wrote narrative and analytical memos and used them as additional components in the analysis (Charmaz 2014).

Focussed coding allowed for new ideas and connections to emerge from the data. By coding for categories (axial coding) I ordered data bottom-up, capturing detail and changes in time. In the course of the analysis I gradually included data related to longer periods of time. As a result, I was able to move from a focus on distinct hazards and disasters to an enquiry about the link between gradual urban change and people's relationship to risk. This round of coding featured codes which I considered central to my research questions, such as change/evolution, urbanisation, forms of CB-DRR and social relations.

The second round of coding comprised development of codes aimed at capturing in greater detail those phenomena which I had identified during fieldwork as central in shaping my informants' experience and their ways of engaging with the city. One such example was a frequent reference to neighbourhood upgrading–*restructuration.* Emergence of this theme across three physical sites led to the analysis in chapter 6, which focuses on upgrading both as an urban development model and an experience shaping collective action across Pikine's communes.

Finally, chapter 7 was produced through a sequence of coded texts. Based on field notes and interviews, I composed a first thick description of one distinct community intervention. The text was coded a second time, completed with relevant data from other sources and rewritten in a way to produce a narrative which incorporates real life actions and the intangible processes behind them.

[31] Examples of maps (code diagrams) developed during analysis are included in the Appendices.

3.6. Writing and structuring the empirical chapters

Academic text is a product of multiple translations: external reality is translated into data, data analysis produces abstracted learning about aspects of reality, all of which is recomposed to convey a segmented yet unified narrative to be presented to the reader. Throughout this process, the researcher has a duty to protect the participants of the research. A written text is a potential actant and as such it has the power to both benefit and harm the informants. I have anonymised the identity of my informants, referring only to their formal roles. I also acknowledge that a written text has an effect of solidifying relationships and attitudes established in the text, acknowledging that observed data represent snapshots of an ever changing socio-physical world. Ultimately, the aim of the text is to provide a narrative which reduces some of the world's fuzziness. It is also a product which reflects a unique experience—that of the researcher. However, the researcher's task is to render the final narrative familiar to others, thus inviting the reader to complement data and develop alternative interpretations.

The subsequent empirical chapters are composed according to the following logic. Chapters 4 and 5 document interactions between physical and social processes that shape intensive and extensive risk in low-income urban neighbourhoods. Chapters 6 and 7 documents distinct community interventions across three sites, focussing on variance across urban CB-DRR initiatives and on opportunities for CB-DRR presented within large urban development projects.

Chapter 4 present field data in a way which examines interconnections among social and physical processes that increase disaster risk at neighbourhood-level. It provides an in-depth analysis of household-level practices in response to periodic hazards. I argue that the practice of land in-filling, waste tipping and illegal sewage leaking follow a logic in which the spatial order of a neighbourhood plays an important role. Neighbourhood space which has been negatively impacted by periodic flooding and long-term water-logging is fragmented and it acts as an attractor for these risk increasing practices. I demonstrate how a combination of

these practices contributes to making neighbourhood-level social relations fragile and increases overall long-term stress associated with permanent uncertainty.

Chapter 5 documents neighbourhood-level community-based interventions aimed to reduce both flood risk and extensive risk linked to the household-level practices addressed in chapter 4. I show how interventions of community-based organisations evolved over a decade of periodic hazards, permanent stress and a growing social malaise. I demonstrate how CBO actions reflect the residents' understanding of the changing nature of risk. Empirical data presented and analysed in chapters 4 and 5 has been collected predominantly through informal discussions with members of youth/women CBO members, site visits and focus group discussions/participant observation of training sessions for youth/women CBO in the communes of Dimaguese Sicap Mbao and Guinaw Rails Nord.

Chapter 6 examines CB-DRR interventions in the context of urban development processes which take place at the scale of the city. I document a connection between neighbourhood-level risk, CB-DRR interventions and participatory urban planning/neighbourhood upgrading projects led by the state. Central to the grounded theory method is a sensitivity to empirical and conceptual leads which are specific to a given study context: during my fieldwork, iterative data collection and analysis indicated that across Dakar's urban regions, participatory neighbourhood upgrading represents both a series of major past interventions and an powerful vision shared by many urban actors. Data from three of Pikine's communes—DSM, DTK, GRN—focusses on the opportunities and obstructions that major state-led urban development projects presented to community organisations engaged in disaster risk reduction.

FIGURE 6: MAP OF FOUR MUNICIPALITIES (*VILLES)* WHICH CONSTITUTE THE URBAN REGION OF DAKAR: DAKAR, PIKINE, GUEDIAWAYE, RUFISQUE,

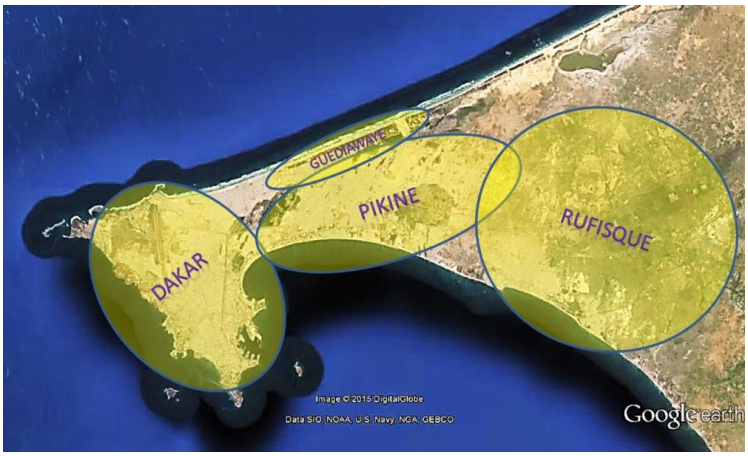
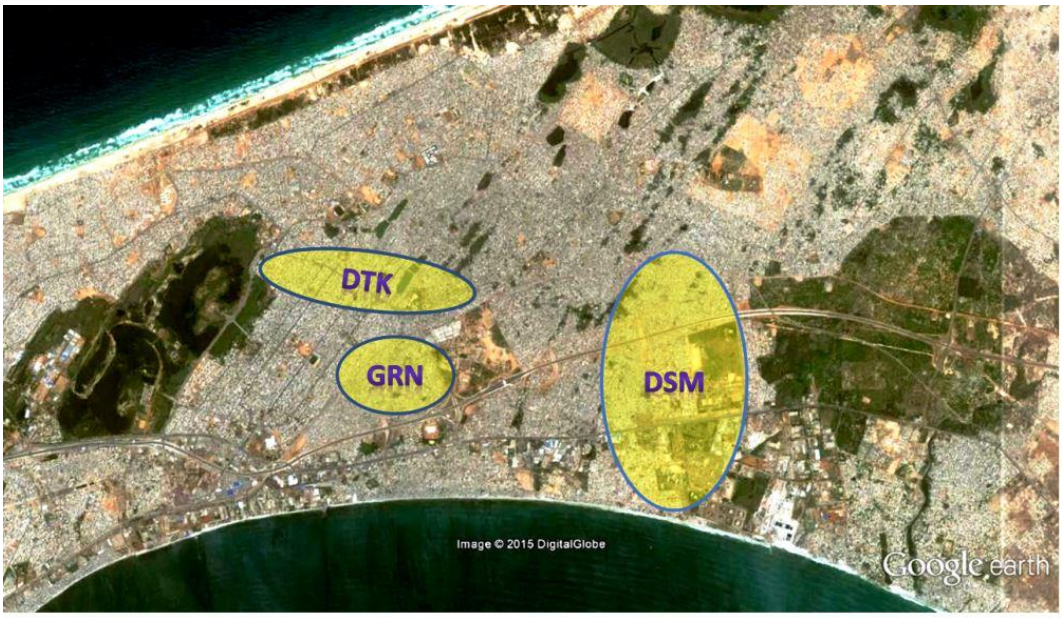


FIGURE 5: MAP OF THREE FIELD LOCATIONS IN PIKINE: COMMUNES D'ARRONDISSEMENT: DIAMAGEUNE SICAP MBAO (DSM), DJIDDAH THIAROYE KAO (DTK), GUINAW RAILS NORD (GRN)



Chapter 7 examines empirical data which enquires about the wider cultural and institutional context within which neighbourhood-level intervention are negotiated across varied sets of urban actors. Elaborating a detailed analysis of a distinct youth-led project in flood risk reduction in the commune of Diamaguene Sicap Mbao, I first focus on questions of identity: the political history of community organisations in Pikine, articulation of local identities and inter-generational differences. Secondly, I analyse the process of negotiations between local actors and the rationales guiding the positions taken and renegotiated in the process. I show how past experience of the participatory planning and upgrading model both shaped the views held by certain actors and produced institutional

legacies which facilitated the involvement of youth in the type of urban development projects for which they traditionally lack sufficient legitimacy.

Sources of data analysed in chapters 6 and 7 include informal discussions with members of youth CBOs, site visits, and participant observation of project implementation and of youth training sessions, local leaders, local government representatives and formal interviews with planning professionals (employees of state agencies and NGO staff).

4. ACCUMULATING PRESSURES DRIVING PHYSICAL AND SOCIAL UNCERTAINTY

4.1. Introduction

The aim of this first empirical chapter is to document interconnected pressures which shape conditions of extensive environmental risk at neighbourhood level. I argue that these pressures increase the risk of social disintegration in Pikine's neighbourhoods. I do this by showing that on a daily basis, neighbourhood deterioration results from physical and spatial fragmentation, and that, although less visible, negative social impacts are highly significant. Firstly, I show how the practice of land in-filling fuels latent conflicts among residents. Stress and uncertainty which were commonly associated with the rainy season are extended months before the rainy season. Secondly, I show how water-induced depopulation has led to a significant number of houses and public spaces being left abandoned and unattended. These sites are continually used as depositories for domestic waste and leaked household sewage. I examine these processes and resident practices as forces which drive extensive risk.

4.2. The practice of *remblai*

4.2.1. Land in-filling and raising of houses

The floods of 2005 remains the most cited event when different interlocutors speak about urban risk in Pikine. The 2005 summer rainfall coincided with a peak in the groundwater table, which has since remained at a permanent high. The event is remembered not only because of the overwhelming devastation which followed, but because it marked the moment from which a significant number of Pikine's residential and commercial buildings became flooded and abandoned by their occupants. During the time of my fieldwork in 2014, in order to prevent irremediable flooding of a household's living space, residents used the technique of sand in-filling (Fr. *remblai)* to raise distinct parts of their properties. The physical activity of *remblai* refers to the use of sand in order to raise houses, courtyards and street levels in front of one's house above the levels of stagnant

water. *Remblai* is done primarily by households, but on occasion it has been a solution applied by CBOs and local authorities.[32] The predominant material for *remblai* is sand, but more recently other material such as construction waste and domestic solid waste have also been used to in-fill streets, courtyards or rooms.

Understanding the structure of a housing unit in Pikine and a household's occupation of a house is useful in appreciating how *remblai* and the overall practice of raising houses are produced. A housing compound is a residential unit composed of a courtyard which is surrounded by individual rooms giving direct access onto the courtyard. Rooms in a compound are occupied by one large household consisting of an extended family or by more households, generally tenant families renting rooms. Pikine's average household is between 6 and 9,1 persons (ANSD 2008; ANSD 2015b). A compound extends across the entire land parcel and it is delimited by high walls. Each compound has a courtyard, the site of most daytime activities, including cooking, eating and relaxing-socialising. Courtyards within compounds are also used for productive activities such as sewing, laundry-washing and raising of domestic animals. In large compounds, individual rooms are often upgraded independently by their occupants and will thus reflect the occupant's resourcefulness and social status. A closer look at the present state of houses in neighbourhoods where *remblai* has been employed intensively reveals a progression of *remblai*.

[32] FGD with female residents and community volunteers, visit to five water-affected properties guided by residents, DSM, 27 June 2014

PICTURE 1: PREPARATIONS FOR *REMBLAI* ACROSS PIKINE
SOURCE: AUTHOR, JULY 2012

PICTURE 2: DIFFERENT LEVELS RAISED AND FLOODED INSIDE A FAMILY COMPOUND
SOURCE: AUTHOR (JUNE 2014)

PICTURE 3: EXAMPLES OF *REMBLAI* IN DSM
LONG PILES OF CONSTRUCTION WASTE ALONG THE HOUSE SERVE TO PROTECT THE BUILDING FROM EROSION CAUSED BY FLOODWATER. *REMBLAI* ALSO SERVES AS A DRY PASSAGE WAY. SINGS OF CONSTRUCTION AROUND WINDOWS SHOW INCREMENTAL RAISING OF HOUSES:. THE HOUSE IN THE BACKGROUND REMAINS AT ITS ORIGINAL HEIGHT.
SOURCE: AUTHOR, JULY 2012

PICTURE 4: ABANDONED AND RECOVERED HOUSES
SOURCE: AUTHOR, JUNE 2012

Initially, *remblai* has been applied to the street in front of one's compound, thus preventing flood water from leaking into the compound. This technique has been effective in diverting flash floods and runoff after heavy seasonal rainfall. As a result, it is not infrequent to see compounds (courtyards and rooms) sunk more than one meter below street level. The technique of raising streets was effective early on in preventing run-off water from entering the compounds, but rising levels of groundwater led to permanent waterlogging inside the courtyards. Courtyards are the locus of a household's daily activities and in-filling of courtyards allows individuals to carry on with their daily activities on higher ground. Through *remblai*, individual rooms became positioned lower than the elevated parts of a courtyard, but they remained protected by raised thresholds. The field notes which follow capture a day-long visit in a water-affected neighbourhood and give a sense of the phenomenon of *remblai*:

> Approaching the first house, it became rather evident that a few trucks of gravel would have never sufficed. The family had left their house after the 2005 flooding and had only returned recently, in 2014, after their children acquired enough money to raise the ground. The house stands on a mound and they must have raised the land by over a meter! I am told that they used between 5 to 10 trucks of sand and gravel. […] we continued the visit. On both sides of the old woman's house, buildings had been deserted, crumbled and boarded up. The house on the right had been pretty much dismantled by the owners. The one on the left side stood empty with all windows and doors bricked up. At the back, hidden behind a tall wall, was some other unfortunate neighbour's house. This house belongs to an old woman, 74, who lives there with her daughter. Over the past seven years they raised the house three times: the ground of the outer courtyard, walls and ceilings. Windows have remained in their original position so they are now at floor level. Older doors are rather low too. Last year the family added an extra free standing room at the back of the courtyard. It is two meters higher than the rest of the house. A sort of 'tourette'. It stands there with holes in the place of a door and windows. They say that adding these would make the cost unaffordable at present. […] Funds for these works are collected through *tontines* (rotating

> savings groups) and take a few years of saving. The old woman's job is to resell dry fish. The last set of construction works cost her three years' worth of savings.[...] We continued our walk to four other houses. A woman whose children are in Europe recently lifted her house by over two meters. To enter, we climbed a steep external staircase. One third of the inner courtyard had not been filled and it remains at its original height. It forms a bizarre canyon separating the elevated house from a neighbour who lives deep down behind a tall wall. They have objects in the lower part of the courtyard, but I don't understand how they access this part of the courtyard. Perhaps, with a ladder? [...] The neighbour, a woman who lives behind on the other side of the wall is deeply worried. This year, water is likely to flow even more directly into her property. She did not discuss this with the neighbour when they embarked on *remblai* and the construction works. No one has openly discussed the potential impacts of construction works with anyone around.[33]

Raising individual rooms or entire compounds is costly and it is therefore undertaken incrementally. Most *remblai* is done shortly before the rainy season when residents invest into mitigation measures.[34] Price of sand varies from 1 000FCFA (£1,20) for a wheelbarrow, 2 500FCFA (£3) for a cart, and between 50 000FCFA to 55 000FCFA (£65-£70) for a truck of sand (16m^3). However, these prices increase before and during the rainy season.[35]

It generally takes multiple years for households to incrementally raise floors, doors, windows and roofs which are the most costly of all. A large proportion of such construction work is financed through women's savings groups, the *tontines*. Alternatively, households wait to pool funds in large families or wait for a substantial remittance payment (Melly 2010; Lessault & Imbert 2011). Incremental changes make adaptation affordable, but in the meantime, housing quality and the residents' comfort and health decrease due to compromised air

[33] *Ibid.*
[34] Inf. int. and neighbourhood visit with com. flood response volunteer/com. health worker, DSM, 12 June 2014
[35] FGD with female residents, GRN, 11 July 2014

flow, increased humidity and temperature stored in corrugated iron roofs. It is not infrequent to enter rooms with ceilings at a mere 170cm to 200cm. Respiratory and skin diseases are frequent problems experienced by children and adults alike (Cisse & Seye 2016).[36,37]

Different qualities of matter used for *remblai* contribute to a spectrum of local health risks. Beach sand has been the standard material for *remblai* but immense demand across Dakar has turned it into a pricy commodity. Black sand used for *remblai* is considered of much lower quality, it is viewed with suspicion as it is said to have a mild toxic odour. People believe that it is mixed with burned industrial waste. Black sand is therefore predominantly used to raise ground outside of the compound. To in-fill larger depressions within courtyards and entire houses, residents also use construction waste, waste from surrounding industrial estates and, in extreme cases, household waste.[38,39] The logic in the use of hazardous materials is one of keeping them outside of the intimate sphere of the house. Nevertheless, precautions taken by resident families are only partial in the case of the omnipresence of risk accumulated in Pikine's overall environment.

Sand used for *remblai* is generally sourced from Dakar's peri-urban beaches and the sand is considered safe in terms of its health impacts. However, its extraction is illegal and it drives major environmental and ecological degradation of the coastal areas.[40] This phenomenon is public knowledge to local residents, professional and authorities, yet there have not been substantial studies undertaken to quantify the damage. Likewise recent national programmes on

[36] *Ibid.*
[37] Inf. int. and neighbourhood visit with com. flood response volunteer/com. health worker, DSM, 12 June 2014
[38] Neighbourhood and project site visit with NGO staff and two *délégués de quartier*, DSM, 10 July 2014
[39] Inf. int. and neighbourhood visit with resident/community volunteer, GRN, 30 June 2014
[40] Part. Obs. at a project proposal writing workshop with two local NGOs, Dakar, 22 February 2016

coastal resource management have failed to include this link between coastal ecological change and processes of urban risk reduction.[41]

Finally, r*emblai* has a devastating effect on basic services and public facilities. In most of Pikine's communes, public facilities such as roads, markets, health centres or schools remain at their original height and they have thus become unofficial water retention ponds. In the commune of Diamaguène Sicap Mbao (DSM), classrooms in a major public primary school were shut down while an adjacent private school was repeatedly raised thanks to foreign donations through a religious charity.[42] Market places in two adjacent neighbourhoods are half filled with stagnant water.

4.2.2. Impact of *remblai* on neighbourhood social relations

Incremental *remblai* of streets and raising of entire houses and individual rooms produces an environment which is vertically fragmented, its topography being in permanent change. It is therefore highly unpredictable environment. Over the past decade, extensive in-filling modified drainage basins at the scale of streets and neighbourhoods and made it difficult for residents to anticipate the flow of water (ADM 2015).[43] At present, most compounds are between 0.5m and 1.5m below street level and restored houses can have their 'ground floors' as high as 2m above street level. New buildings are erected on foundations which, not too long ago, used to serve as the original ground floor.

Physical fragmentation of the environment has severe implications for the production and perception of flood risk. Elevating one's house, or some of its rooms a few meters above the level of stagnant water and seasonal floods,

[41] Stakeholder Interviews during mid-term evaluation of an NGO intervention in the context of a national programme Integrated Management of Coastal Zones (Projet de gestion des zones côtières du Sénégal - GIZC), Dakar-Mbour, 01 August 2014

[42] Int. with NGO staff, urban dev. and decentralised drainage infrastructure, project site visit at DSM, 20 June 2014

[43] Neighbourhood project site visit with NGO staff and two *délégués de quartier*, DSM,, 10 July 2014

conditions whether a family can or cannot stay living in their home. *Remblai* as a solution brings relief to some while it becomes a hazard for others. A household's capacity to *remblai* perpetually erodes a neighbour's capacity to reduce flood risk.

Failing to continually invest into additional elevation of a house makes one lag in a race for a safe shelter.

> D. pointed out that people get very nervous when neighbours embark on construction works. It is a vertical race and everyone is there for themselves. Tetris style. Those who stay below are in trouble and they soon find themselves in water. For the moment, I have not heard anyone say that they would have coordinated with neighbours. In general, people say that neighbourly relations worsen in anticipation of the rainy season.[44]

Uncertainty about water's ways is echoed in an extended social malaise. Lack of information about fellow residents' future interventions leads to distrust towards one's neighbours.[45] It is said that this is because residents rarely communicate about their future construction plans. For some, decisions to *remblai* are taken in a rush when larger sums of money become available. But some residents and CBO leaders have also indicated that information about future personal or collective projects cannot be shared; indiscretion implies taking a risk of having one's activities sabotaged due to jealousy and malice.[46] Socio-cultural specificities are thus an important factor in the creation of social tension related to flood risk.

Remblai is a practice which brings forward the perceived beginning of a rainy season.[47] Through *remblai*, stress which is commonly associated with emergency periods is present long before a natural hazard makes its landfall.[48] Uncertainty and distrust precede the start of the rainy season. A period which classical disaster risk management designates for preparedness initiatives is thus

[44] FGD with female residents and com. volunteers, visit of 5 water-affected properties guided by residents, DSM, 27 June 2014
[45] *Ibid.*
[46] Strategic meeting of CBO, NGO and *délégué de quartier*, DSM, 21 November 2014
[47] FGD with female residents, GRN, 11 July 2014
[48] *Ibid.*

simultaneously a period of general social discomfort. This social malaise is in striking contradiction to a general discourse about social cohesion deployed by Pikine's residents.

4.3. The practice of waste tipping

4.3.1. Abandoning one's house

This section documents the practice of waste tipping in Pikine, emphasising that it is a complex social phenomenon. Ambiguous pollution-prone spaces are the products of depopulation of residential areas, induced both by extended and repeated flood emergencies, extensive waterlogging and development projects. The household-level practice of waste tipping is both criticised and tolerated, but its impacts contribute to a social fragmentation of Pikine's neighbourhoods. The link between waste management, production of flood risk and interventions to reduce this risk is a major theme recurring in the empirical data collected during fieldwork.

Omnipresence of waste has become a daily reality in Pikine's flood-affected neighbourhoods. Over a decade since the floods of 2005, depopulation of water-affected neighbourhoods presents a distinct set of challenges for residents who remain in their homes. In Pikine, depopulation has led to a large number of abandoned houses filled with stagnant water. These houses became attractors for illicit and polluting activities. Abandoned houses and open unused spaces became filled with waste and formed a dense mosaic of accumulated risk, enveloping families who have continued living in the neighbourhoods.

Three distinct processes lead to depopulation and a consequent transformation of the abandoned properties into liminal pollution-prone sites. I identified three categories of vacated residential land. Firstly, large swathes of formerly inhabited land became deserted after formal resettlement programmes. Phased resettlement by state agencies of hundreds of households severely affected by the 2005 floods produced expanses of deserted land, most of which were officially declared and re-categorised as natural and engineered water retention

reservoirs.[49,50] Whereas much attention had been paid to the resettlement process and to corruption scandals related to the resettlement zones, it was the effects of depopulation and fragmentation of original neighbourhoods that had severe negative consequences on the lives of Pikine's remaining residents. The experience of the water reservoirs was not one of a successful solution, but instead of mere expanses of waterlogged land with ruins of partially dismantled houses, areas which had lost their residential function and changed their status from having been privately occupied land to ambiguous marshland. Such liminal sites are at high risk of being contaminated by waste.

A second type of deserted land was formed by patchworks of abandoned water-affected properties scattered in otherwise densely populated neighbourhoods.[51] Former residents, although absent, often regularly verify the state of their property, but they rarely avert polluting or criminal activity within the sites.[52,53] Finally, a third type of ambiguous, pollution-prone land results from state-led urban development projects, among which are neighbourhood upgrading interventions, state-built water retention ponds and major transport infrastructure projects.[54] After resettlement of households affected by such projects, unused land on the edges of the physical interventions acquires an ambiguous nature.

4.3.2. Counting abandoned houses

Information about the number of water-affected houses and the variation in the nature of water's impacts is not readily available. Towards the end of my fieldwork, when I relied on solid relations with NGOs, local CBOs and community leaders, I enquired about existing statistics. Initially I approached a local NGO which had long been working on flood-related projects. The organisation had no data to share, but it referred me to heads of flood committees in five CBOs,

[49] Int. with local resident/*délégué de quartier*/president of a *'GIE de restructuration'*, 02 December 2014
[50] Int. with NGO staff, 07 February 2016
[51] Strategic meeting of CBO, NGO and *délégué de quartier*, DSM, 21 November 2014
[52] Inf. int. with resident/community volunteer, GRN, 07 July 2014
[53] Strategic meeting of CBO, NGO and *délégué de quartier*, DSM, 21 November 2014
[54] Inf. int. with local residents/members of CBO executive committee, 08 February 2016

members of a local CBO flood network support by the NGO. To my surprise, only one of five CBOs was able to provide meaningful data. I explore a different avenue and made individual visits to seven formal neighbourhood leaders, the *délégués de quartier.* I found a great variation in the degree of detail across the *délégués*' records. All of my interlocutors pointed out that such information was kept for a single year and it was used uniquely for reporting to local government and civil protection services which used it to allocate emergency aid.

The following is data illustrates the type of information kept, and made available by *délégués de quartier* in the commune of Diamaguène Sicap Mbao.[55]

In a neighbourhood comprising 623 houses:

- Yearly, some 78 houses were affected by water.
- In 2015, 52 houses were inundated and abandoned for over three years.
- Some 26 houses were permanently waterlogged for over three years but remained inhabited.
- Between 2006 and 2008 some 53 houses had been resettled by the state (12 houses resettled in 2006 and 41 in 2007/8) - this land remains vacant.

In a neighbourhood comprising 370 houses:

- Yearly, some 68 houses remain impacted by water, even after pumping.
- In 2015, 17 houses could be recovered.
- Some 43 houses had been inundated and abandoned for over three years;
- Before 2015, some 30 houses had been permanently water logged for over three years but remained inhabited. In 2015, there were 9 such houses.

In a neighbourhood comprising 99 houses:

- Some 13 houses were inundated and abandoned for over three years.
- In 2015, 3 houses were permanently water logged for over three years but remained inhabited.

[55] Individual interviews with seven *délégués de quartier*, DSM 07 March 2016

PICTURE 5: PERMANENTLY GREEN AREAS SIGNAL THE PRESENCE OF SURFACE WATER
DRY PASSAGE WAYS CIRCUMVENT ABANDONED AND SUBMERGED HOUSES. SOURCE: AUTHOR, MAY 2012

PICTURE 6: WASTE DEPOSITS IN ABANDONED WATER-AFFECTED SITES
A PERMANENTLY FLOODED ROAD BEING CLEANED FROM SOLID WASTE, REEDS AND SLUDGE BY RESIDENTS AND MEMBERS OF A YOUTH CBO DURING A *SET SETAL* SESSION.
A WATER-AFFECTED ABANDONED HOUSE IN-FILLED WITH DOMESTIC WASTE. SOURCE: AUTHOR, SEPTEMBER 2014

4.3.3. Ambiguous deserted spaces as attractors for residents' risk-increasing practices

There is a general feeling among local residents that land which has unclear ownership and an ambivalent function is at imminent risk of being transformed into a waste tipping site. Waste tipping is often the sole reasonable means to dispose of domestic waste.[56] Residents also in-fill neighbouring deserted houses in the hope of reducing exposure to surfaces of stagnant water inside the ruins. They deem health risks associated with open waste lesser than those associated with the presence of mosquitoes, wild animals, and spaces unsafe for children.[57,58]

Household and industrial waste has also become a new resource, a substitute for sand to in-fill low lying houses and surrounding land.[59] Residents reported that families who moved into rental accommodation in the vicinity of their water-affected house, embarked on systematic in-filling of their property, disregarding the disturbance this caused to the neighbours. Furthermore, in order to accelerate the process of in-filling and increase the prospect of house recovery, some house owners allegedly paid private entrepreneurs who ensured that construction waste and industrial waste were dumped onto the property. On the extreme end of this practice are households who in-fill selected water-affected rooms, while they continue to occupy other parts of the house.[60,61,62] This practice is not limited to the poorest of households; it is not unusual to see this phenomenon in relatively well-off households, including those of community

[56] Part. Obs. at NGO gender training workshop (D1) and focus group discussion, Keur Massar, 12 November 2014
[57] Neighbourhood and project site visit with NGO staff and two *délégués de quartier*, DSM, 10 July 2014
[58] FGD with female residents and community volunteers in the context of evaluation of a community project (unattended, transcript used as data), DSM, 05 January 2015
[59] Neighbourhood and project site visit with NGO staff and two *délégués de quartier*, DSM, 10 July 2014
[60] Inf. int and neighbourhood visit with com.flood response volunteer/com. health worker, DSM, 12 June 2014
[61] FGD with female residents and com. volunteers, visit of 5 water-affected properties guided by residents, DSM, 27 June 2014
[62] Neighbourhood visit, Wahkinane Nimzatt, 3 July 2012

leaders, *délégués de quartier*, who had been able to secure sufficient resources not to be forced to resettle.

> According to C., there is a large spontaneous waste depot inside two abandoned compounds next to his home in Diamaguène Sicap Mbao. C. and two other influential members of the local youth CBO examined the site on a number of occasions. Residents argued that by tipping their domestic waste into the remnants of the house, they maintained good relations with their former neighbours. Allegedly, before quitting, the original owner had asked them to in-fill the houses with waste. Twice, the CBO made a failed attempt to get in touch with the owner.[63]

> N.F. confirmed that abandoned houses in Guinaw Rail Nord were being routinely filled with waste. She said that her neighbours had to be rehoused and they rented a room in a house across the street. The husband asked his wife to tip waste into the abandoned property. Allegedly, when surrounding residents complained about this practice, the couple refused to engage in a dialogue. N.F. was not aware of any house which would have had been fully recovered in this way.[64]

> B. and his colleague complained endlessly about people tipping waste in flooded areas. Later I asked whether it was true that many owners of houses which had been flooded have asked neighbours and even waste collectors to drop waste onto their land as a form of *remblai*. According to B., some even pay to have larger amounts of waste dumped on their land.[65]

Salvaging property is the key motivation for such arrangements, but there is general scepticism about the efficacy of this 'new resource'. None of my interlocutors knew of abandoned houses which would have been recovered by

[63] Part. Obs. at NGO gender training workshop (D2) and focus group discussion, DSM, 13 November 2014
[64] Inf. int and site visit with volunteer teachers at community school, DSM, 24 June 2014
[65] *Ibid.*

using waste as construction material.[66] Some suggested that the idea of a resource was simply used to defend the actions of those who do not wish to pay for collection or do not have access to such a system.[67]

Finally, an important driver for waste tipping in water-affected and abandoned private houses is the need to protect the property from unsolicited occupation during one's extended absence. This form of dissuasion is the cheapest form of securitisation of one's property. Such properties become locked land. For the owners, they represent a promise of a future return whereas for surrounding residents they represent a potential hazard and a reminder of a neighbourhood's decline.

4.3.4. Impact of waste tipping on local social relations

Fieldwork data indicates that waste tipping has specific adverse impacts on neighbourly relations. Whereas residents denounce waste tipping, there is a general feeling of powerlessness to change this situation. Despite a strong formal organisation at neighbourhood level, grounded in the system of *délégués de quartier,* committees of elders, religious and other moral authorities, there is a general feeling of anarchy when it comes to addressing the solid waste crisis.[68] Residents blame each other for lack of mutual consideration. Depending on the site, some waste tipping has been perceived as an attack on the authority of the *délégués de quartier*.[69,70] Although such motives have been denied, waste has remained a symbolic means to question the status quo of social and institutional hierarchies (Fredericks 2014).

The personal safety of residents living in water-affected neighbourhoods is jeopardised by the presence of deserted waste-filled houses, which have provided

[66] Site visit with secretary general of the local government Flood Management Committee, GRN, 15 October 2014
[67] Part. Obs. at NGO gender training workshop (D2) and focus group discussion, DSM, 13 November 2014
[68] *Ibid.*
[69] Inf. int. and project site visit with a *délégué de quartier* and an NGO staff member, DSM, 16 June 2014
[70] Neighbourhood and project site visit with NGO staff and two *délégués de quartier*, DSM, 10 July 2014

operational ground for criminals. In a neighbourhood in the commune of DSM, large numbers of clustered abandoned houses are known to serve as shelter for local criminal gangs.[71] Because pedestrian mobility across the area has been curtailed by flooded zones and railway tracks protected by walls with limited openings, local residents do not have the option of circumventing the site, and have become regular victims of night crime. Personal property in one's house is also considered at risk of theft when neighbouring houses become deserted. It is said that thieves use abandoned properties as reliable passageways.[72] Particularly at risk of theft are assets left in the courtyards of houses; often the most valuable of these being domestic livestock (rams, chickens and goats). Purchase of such animals requires substantial capital and urban animals often provide steady income, serve as marketable assets, or are kept for special occasions such as religious holidays and family festivities. Loss of such assets therefore reduces a household's financial liquidity reserve and makes it more vulnerable to shocks.

4.4. The practice of leaking sewage

4.4.1. Faecal sludge management in Pikine

This section enquires about the impact of periodic flooding and permanent waterlogging on residents' behaviour and attitudes to sanitation. Pikine's neighbourhoods lack networked sanitary infrastructure. Sanitation is ensured almost exclusively by individual on-site facilities, namely basic and improved pit latrines and facilities with septic tanks. This type of coverage is not only affordable to most residents, but it is also the legacy of a large state-led programme which aimed to provide and improve on-site sanitation in poor urban neighbourhoods within Dakar region—the Long-term Water Sector Project (2001-2009) and its component in Pikine, the 'On-Site Sanitation Program for Peri-urban Areas of Dakar (PAQPUD 2002-2008)'.[73,74] Between 2003 and 2005, PAQPUD funded the

[71] Inf. int. and site visit during an internal regional workshop of an INGO, Dakar 22 April 2015
[72] Inf. int. with local resident, GRN 04 September 2014
[73] Inf. int and transect walk with NGO water infrastructure specialist, DSM, 22 April 2015.

installation of some 63 000 autonomous sanitary facilities including washing facilities, soak away pits, showers and latrines as well as 76 toilet blocks in schools and 16 public lavatories (World Bank 2009). A number of evaluations of this programme claim a combination of success and failure (Guène et al. 2010; Norman et al. 2011; USF 2012; Scott et al. 2015). Nevertheless, operations and maintenance of on-site sanitary facilities has become an insurmountable difficulty in the context of a rising groundwater table and recurrent flooding.

4.4.2. The practice of *vidange* and DIY emptying of septic tanks

Scott *et al.* (2015) speak of the need to understand 'sanitation service chains', by which they refer to pathways of faecal matter which include not only standard sewage infrastructure networks but also individual formal and informal techniques of sludge disposal. Households in Pikine employ three principal techniques of faecal sludge management. Formal means include emptying of septic tanks mechanically, relying on the service offered by private entrepreneurs with suction trucks. Informal practices include emptying septic tanks manually onto the street or leaking them into neighbouring abandoned houses and disused space. The following section focuses on the informal practices.

Vidange (Eng. emptying) is the practice of manually disposing of the contents of one's septic tank into open cavities dug in the street in front of one's compound. Although officially prohibited, this practice is widely tolerated. On certain streets in Pikine each or every other house practices *vidange.*[75] Scott *et al.* (2015) estimated that in 2008, some 40% of households in Pikine chose to dispose of their liquid waste through *vidange,* either by contracting a worker or doing it themselves. Increasingly, with the water table at a few centimetres below the ground, households struggle to maintain their sanitary facilities. Most septic tanks have structural and material defects which makes leaks into and out of a tank a

[74] Programme d'Assainissement Autonome des Quartiers Peri-urbains de Dakar (PAQPUD). The programme was implemented by the national water and sanitation agency (ONAS), the agency for public works (AGETIP) and numerous NGOs.

[75] Inf. int and neighbourhood visit with com.flood response volunteer/com. health worker, DSM, 12 June 2014

norm rather than an exception. *Vidange* is the cheapest method for households to maintain a minimal functionality of the facilities. The technique is used regularly to ensure that some free volume is available in a latrine or a septic tank.

PICTURE 7: VIDANGE AND LEAKING OF BLACK WATER
A LARGE *VIDANGE* HOLE DUG IN FRONT OF A HOUSE IN AN AREA SUFFERING FROM HIGH GROUNDWATER LEVELS.
A STREET FLOODED BY GROUNDWATER AND ILLICIT SEWAGE LEAKS FROM SURROUNDING HOUSES.
SOURCE: AUTHOR, APRIL 2015 & NOVEMBER 2014

Vidange is practiced all through the year, but the frequency increases significantly before and during the rainy season.[76] Before the rainy season, frequent emptying of one's septic tank is part of ensuring that volume is available when groundwater starts to rise. As such, *vidange* can be understood as an important act of preparedness. During the rainy season, due to the compromised capacity of septic tanks to hold liquid, households in Pikine's low-lying neighbourhoods perform manual emptying of their septic tanks on a daily basis (Enda Tiers Monde 2013a; Enda Tiers Monde 2013b). After the rainy season, when groundwater levels remain high, *vidange* ponds are dug shallower, but larger in diameter, which results in larger surface exposure. The practice thus creates exposure to faecal

[76] Inf. int. and transect walk with NGO water infrastructure specialist, DSM, 22 April 2015

matter which varies over the year. *Vidange* became tolerated due to high groundwater which is absorbed into low-quality septic tanks and cesspits. Nevertheless, constant faecal contamination of neighbourhoods during periods of rain and high exposure due to the permanent presence of *vidange* holes has become a major health risk.[77] In Pikine's narrow streets, playing children are most at risk. *Vindange* is publically spoken of as the domain of male activity. It is men who are contracted and remunerate when external help is required. However, in practice, women regularly and frequently perform *vidange* in order to ensure that a compound's sanitary and washing facilities remain functional.[78]

4.4.3. Illegal sewage leaks

Whereas *vidange* remains a disputed public practice, a different, less visible practice of sewage leaking has gained in prominence. The omnipresence of deserted submerged houses has led neighbours to leak their septic tanks directly into the depressed ruins.[79] Households living close to frequently waterlogged low-lying streets and roads have developed a practice of leaking their septic tanks into such outlets.[80] Likewise,

Digging inconspicuous narrow open drains or installing small-diameter underground tubes has a minimal cost when channelling sewage across small distances. Such connections are illegal, but there is no enforcement to prevent this practice and whereas they are highly criticised by other residents, but they are ultimately tolerated.[81]

During a focus group discussion, participants addressed the issue of these leaks: the discussion revealed that a dozen houses use a permanently flooded major

[77] *Ibid.*
[78] Part. Obs. at NGO gender training workshop (D2) and focus group discussion, DSM, 13 November 2014
[79] Inf. int. with local residents/members of CBO executive committee, DSM, 08 February 2016
[80] FGD with female residents and community volunteers in the context of evaluation of a community project (unattended, transcript used as data), DSM, 05 January 2015
[81] Part. Obs. at NGO gender training workshop (D2) and focus group discussion, DSM, 13 November 2014

road and adjacent land as an open air outlet for their septic tanks.[82] Parts of the road have thus become extended puddles of black water. Infrastructure specialists and members of a local youth CBO who operate water pumps to reduce waterlogging on the road confirmed that permanent waterlogging of streets and houses is increasingly the result of intentional sewage leaks.[83,84,85,86] Similar to the practice of *vidange*, leaks are never extended beyond a neighbourhood. As will be discussed in the following chapter which examines community-based risk reduction interventions, this spatial logic is disturbed only when networks of seasonal open drains are dug across neighbourhoods. Considering the practice of illicit sewage leaks is thus inseparably linked to a discussion about the opportunities and the limits of community disaster risk reduction. It is also a discussion about the immense health risks that local residents, often young men, engage in through seemingly benign neighbourhood-level development projects.

4.4.4. Impact of open black water on social relations

Vidange and unauthorised sewage leaks are highly criticised, but tolerated practices. During two independent focus group discussions with women, the participants highlighted the need to address this highly polluting practice. However, unlike the issue of waste tipping, residents will not discuss this issue openly. It took five months of fieldwork enquiring about aspects of everyday life in water-affected Pikine before I heard of the issue during a focus group discussion. Nevertheless, while residents disapprove of these practices, most households have had to resort to them at some point in time.

Increase in frequencies of *vidange* before the start of the rainy season is an additional element contributing to stress which precedes every rainy season. This

[82] *Ibid.*
[83] *Ibid.*
[84] Transect walk with CBO general secretary and Inf. int. with CBO president, Diamaguene Sicap Mbao, 22 September 2014
[85] Int. with Project Manager/engineer at SINCO SA. , 11 November 2014
[86] Int. with NGO senior staff member/urban development and infrastructure specialist, 26 September 2014

practice adds to the general feeling expressed by my respondents that life in water-affected neighbourhoods has become anarchic and that neighbours tend to act short-sightedly and without concern for others.

This chapter examined household-level practices which drive the production and accumulation of extensive risk in Pikine's areas affected by periodic flooding and long-term waterlogging. To conclude, it is universal for cities to evolve on accumulated layers of material deposits, including a city's own waste. But in Pikine, the sheer speed of this process over the past decade will, one day, provide archaeological finds that will testify of the residents' immense stress. Even then, however, as remarked by one of my key informants, what the material environment and photos will not disclose is "how families become dislocated, how an aunt assembles all of the children and takes them 14km away, how the grandmother is rehoused 30km away, and how we leave behind the older teenage boys who we think are strong enough that they will be able to survive living in the water."[87]

[87] Int. with NGO senior staff member, DSM 09 July 2012

5. EVOLUTION OF COMMUNITY INTERVENTIONS

5.1. Introduction

This chapter presents the chronological sequence of interventions developed by community organisations in Pikine. I focus on interventions that address flood impacts and aim to decrease the risk of flooding. I analyse the link between these interventions and evolution in the thinking of CBOs, including their conceptualisation of local risk. I examine interventions within two broad categories, emergency actions and actions in the domain of risk reduction aimed at long-term socio-spatial change. Actions which lead beyond emergency interventions are developed in response to an overwhelming gap in the provision of basic urban services, namely secondary drainage, waste collection and sewage infrastructure. In the light of the argument presented in the previous chapter, interventions addressing these infrastructure gaps have a deeper motive – that of maintaining peace and social cohesion in neighbourhoods put under accumulated stress. I present the data in a chronological fashion with the aim to examine the link between the choice of action made by a distinct CBO, the methodology of their interventions, their conceptualisation of urban flood risk and the changing local socio-cultural context. When I discuss activities of multiple CBOs, I draw on data from participant observation during workshops and focus group discussions organised by two NGOs; these were attended by up to 10 CBOs. Data from such larger events confirm that the activities developed by the youth CBO which I describe in detail, situations that they faced and concerns that they expressed are not unique to this organisation. A detailed analysis of one youth CBO can facilitate understanding of the wider context of community action in Pikine.

5.2. Emergencies and humanitarian action

Predominant among early initiatives of the youth CBO was humanitarian support to local residents affected by floods. After 2005, humanitarian action by CBOs and NOGs alike consisted of three principal interventions: distribution of life-support material to individual households during flood emergencies which included

drinking water, food, mosquito nets, disinfection products, *etc.*; in-filling of low-lying parts of streets and public facilities such as schools; and water pumping with or without the support of the civil protection services.

5.2.1. Distribution of life support material

As of 2005, for almost seven years, most interventions in Pikine focussed on flood emergency management and mitigation: NGOs provided seasonal humanitarian support to individual households and community groups in the form of material, financial and logistical support. Guided by its support NGO, members of the youth CBO in DSM undertook rapid needs assessments which fed into planning and distribution of sanitary material such as soap, bleach, mosquito nets, or buckets to evacuate flood water (EVE 2010).[88] The NGO had been present in the zone before 2005. Prior to the unprecedented and devastating floods of 2005, its work focussed on sanitation improvement: since 2002, it participated in a major state-led programme in latrinisation of peri-urban areas.

5.2.2. *Remblai* as a public good

In the course of my data collection, planning and technical professionals generally commented on the local practice of *remblai* with a hint of denunciation. Some labelled the technique as inappropriate local knowledge; others called it maladaptation. But *remblai* conceals a much broader context which can be accessed through a political ecology perspective. Watts and Peet (2004) highlighted that indigenous environmental knowledge is neither necessarily evenly distributed within local societies, nor is it necessarily right just because it exists. It is often relatively recent and thereby hybrid in nature. At first sight, Dakar's sand appears to be a readily accessible and affordable resource for low-income residents, making it a material of first resort. However, the origins of the technique lie within a specific industry: sand in-filling of low-lying marshlands of the *Niaye* (depressions) has long been a strategy for large public and private sector real-estate development companies and their preferred means to access

[88] Int. with NGO senior staff member, DSM 09 July 2012

and convert land in the vicinity of Dakar's colonial quarters into highly profitable constructible parcels. The past 50 years of the history of urbanisation in Dakar's suburbs display a boom of such private sector actors—involving both Senegalese and international companies. More recently, between 1998 and 2003, private real-estate development companies took advantage of large flooded areas within Pikine's *Grande Niaye* (large depression) in order to develop new housing estates for middle (and high) income clients. Access to such land was paralleled by forced evictions of those low-income residents and peri-urban agricultural workers who stood in the way of capital.

Emulating a technique of *remblai* used widely by residents, CBOs too engaged in initiatives to in-fill low land affected by stagnant water. In one of the zones of the commune of DSM, the primary focus was to recover a major public school. Supported by NGOs, the youth CBO organised cleaning sessions in order to clear large surfaces of reeds and levelled the ground with trucks of sand. However, despite substantial resources dedicated to these actions, the school, one of the largest in the commune, closed eight of its 14 classrooms.[89]

Whereas emergency humanitarian actions had been designed to aid vulnerable households, interventions involving sand *remblai* engaged CBOs with collective needs. Nevertheless, they remained highly localised, which meant that when CBOs opted for *remblai,* they seldom coordinated with other actors. Sporadic actions regularly led to dislocation of water, increasing internal tensions within and across neighbourhoods.

5.2.3. The symbolic utility of inefficient techniques

Pumping as a solution of first recourse

Since 2005, Pikine's neighbourhoods have received highly varying assistance from the Senegalese state. As discussed briefly in the two chapters above, pumping became a dominant solution between 2005 and 2010. It was central both to

[89] FGD with female residents and community volunteers, evaluation of CB-DRR project, DSM 05 January 2015

actions by better-off households and government disaster risk management policy.[90] Evacuation of water from individual houses by pumping followed a spatial logic: residents evacuated water onto streets, where it became a responsibility of government agencies. Official pumping was promoted through the National Relief Organization Plan (*Plan ORSEC*) and executed by the civil protection services (GoS 2010; GoS 2014). Members of the fire brigade operated water pumps within neighbourhoods for an average period of three months per year. Where possible, they worked together with municipalities and with local CBOs. However, it became a responsibility of residents and CBOs to fundraise within the neighbourhoods in order to ensure maintenance and refuelling of these motor pumps.[91] In neighbourhoods with a history of community organising, CBOs eventually extended the scope of their activities and took on this task although officially still under the supervision of the civil protection services.

In neighbourhoods without secondary infrastructure, CBOs were at the forefront of initiatives ensuring effective evacuation of water into distant state-built infrastructure. In the commune of DSM, members of the youth CBO acquired their own motor pumps and the organisation was thus able to stop relying on the national emergency services.[92] The CBO balanced its treasury through membership fees and payments from a neighbourhood waste collection scheme. This allowed for further purchases, maintenance and operation of pumps.[93]

Over a span of five years, the CBO's experience of responding to floods through deployment of their own pumps in a number of water-affected neighbourhoods confirmed the inefficiency of this solution.[94] State-run pumping stations built to provide drainage from Pikine's ten catchment areas were systematically out of order, which resulted in frequent flooding of houses in the vicinity of these stations and along nodes on the infrastructure network (APS 2014). In the

[90] Inf. int. with gen. secretary of *Comité Local de Gestion des Inondations*/Comité de Coordination*pour le Développement de Guinaw Rail*, GRN 12 October 2014
[91] Int. with NGO senior staff member, DSM 09 July 2012
[92] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016
[93] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014
[94] Inf. int. with NGO senior staff member, DSM 11 November 2014

commune of DSM, neighbourhood associations who operated their own pumps were periodically ordered by civil protection services to suspend their pumping activity. Such moments of impasse prompted community organisations and their support NGOs to seek alternative solutions (EVE 2010).

PICTURE 8: A FLOODED NEIGHBOURHOOD IN DSM, 2013
AN IMPORTANT SECONDAY STREET AND MARKETPLACE IN A NEIGHBOURHOOD IN DSM FLOODED IN SEPTEMBER 2013. SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 9: CBO MEMBERS OPERATE A MOTOR PUMP
CBO INTERVENTION IN A NEIGHBOURHOOD IN DSM FLOODED IN SEPTEMBER 2013
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 10: CBO MEMBERS INSTALL A NEW MOTOR PUMP
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2014. ACCESSED ON 10.12.2016

Autonomy, inclusion and gender in relation to floodwater pumping

The following sub-section elaborates on the link between technological solutions and social concerns identified by CBOs. Although inefficient, pumps have played the role of a social mediator within a community and among organisations. Members of the youth CBO in DSM emphasised the contribution of young technicians who operated the organisation's motor pumps—many of whom were young men with minimal formal education. CBO leaders were highly vocal about the value of these men's skills. They belittled the pragmatism inherent in such a concern and instead emphasised its social implications. Valuing the skills of all members was essential in order to avoid tension inherent in organisations with a highly varied socio-economic membership base. Discrimination and conflict based on education and socio-economic status permeate youth and community groups. For youth CBOs in Pikine countering these tendencies has been an important credo. Pumping provided a means to value the skills and the contribution of less educated, but technically proficient youth.[95,96]

Acquiring a capacity to operate, maintain and finance pumps thus carried a symbolic meaning for the youth CBO. Owning and operating a pump was also perceived as supremely important, because it increased the organisation's legitimacy and it improved the youth's status *vis-à-vis* the local government and other senior and more powerful local actors. According to members of the youth CBO, ability to independently cater for some of the needs at neighbourhood level enabled leaders of the organisation to engage in new partnerships with the municipality. The nature of these partnerships, they emphasised, differed from their relationship with NGOs, which they held continued to perceive them as 'beneficiaries' and 'young volunteers'.

Nevertheless, whereas technology may have challenged the socio-economic disparities within organisations and some institutional power relations, it hardly

[95] Particip. obs. at NGO gender training workshop and FGD, Keur Massar 12 November 2014
[96] Particip. obs. at NGO-led training session on dev. of youth CBO project proposals, DSM 18 September 2014

modified gender disparities. Operating pumps and digging temporary water canals has remained a gendered activity.[97]

5.3. Addressing infrastructure gaps

Prompted by a second major flood in 2009, residents and civil society organisations embarked on a move from a humanitarian to a developmental approach in flood risk reduction.[98] The most important change was their investment of energy and of local resources into the production of seasonal temporary open drainage. This choice was motivated by a realisation that neighbourhoods could no longer be kept liveable through individualised un-coordinated interventions, both by households and diverse community groups. The two disastrous flood events of 2005 and 2009 called additional attention to the omnipresent lack of networked infrastructure. The national sanitation agency, the l'*Office National de l'Assainissement du Sénégal* (*ONAS*) is not present in Pikine and Gué*d*iawaye.[99] Community-coordinated seasonal drains and their networks became a critical commentary on the inefficiency of pumping, which persisted as a solution prioritised by the government (GoS 2010). Between 2009 and 2014, local NGOs advocated for a change and enlisted active participation and support of CBOs, neighbourhood authorities and elders, municipal officers, the sous-prefecture and the regional council (EVE 2010).

Digging temporary drainage canals, which facilitate water's flow through the sandy streets of Pikine is a technique originally employed spontaneously by the residents of Pikine. Promoted by NGOs and taken up by CBOs, independent initiatives were coordinated into a systematic project guided by a more nuanced understanding of flood risk reduction. Drainage was no longer viewed as a means to prevent flooding, but as a means to control the flow of water and shorten the duration of flood emergencies.

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[97] FGD with female residents and com. volunteers, visit of 5 water-affected properties guided by residents, DSM 27 June 2014

[98] Int. with NGO senior staff member, DSM 09 July 2012

[99] Inf. int. with gen. secretary of *Comité Local de Gestion des Inondations*/Comité de Coordination*pour le Développement de Guinaw Rail*, GRN 12 October 2014

Shortening of the period of flooding increases chances for households to endure emergencies caused by intensive yet relatively short floods without the need to relocate. Short-term rents in Pikine increase significantly before and during the rainy season. Due to high probability of flooding across large parts of Pikine, the rainy season is a period of high demand in temporary housing and an opportunity for landlords to increase their profits. Given the average size of Pikine's households being 9-12 members, even temporary rehousing constitutes a critical decision (Cisse & Seye 2016). Separation of family members has caused major anguish; for instance, stronger teenage boys and men often stay guarding water-affected houses, while smaller children and elders are sent to relatives and other adults in search for small rental accommodation in the vicinity of their homes.[100]

Members of community organisations further conceptualise the shortening of emergency periods as a way to reverse depopulation and its adverse outcomes. As demonstrated in the previous chapter, depopulation leads to an environment prone to further social and spatial disintegration. The following quotes indicate that a determination to help families to withstand flooding has been at the core of community action.

> When speaking to the youth CBO in September, they too emphasised that their priority as of 2008 had been to keep families in the neighbourhood. One of their priorities is to prevent that their neighbours are forced to leave because their houses get flooded.[101]
>
> One of the aims of the organisation has been to help avoid that families affected by flooding leave the area. This was particularly the case in between 2005 and 2008.[102]
>
> […] there are many abandoned and flooded buildings and houses in GRN and this has an extremely negative impact on the quality of life in

[100] Int. with NGO senior staff member, DSM 09 July 2012
[101] Inf. int. with local resident and president of the women's network of DSM, DSM 15 July 2014
[102] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014

> the neighbourhoods. Especially impacted is neighbourhood social life and social relations.[103]

Timing and duration are important aspects of neighbourhood-level temporary open drainage for a second reason. Shortening the period during which neighbourhoods are criss-crossed with open drains follows a highly practical logic: it shortens the period of opportunities for pollution. Drains are dug as late as possible, at the very start of a rainy season or even following the first major rainfall. Drains are closed as soon as it is deemed possible. Considering the importance of containing overall pollution, such timing is reasonable and highly rational; the underlying rationale is to reduce opportunities for opportunistic waste tipping and sewage leaks.[104] What may seem delayed action is in fact a conscious rational decision when considering the broader contextual elements.

Beyond the local neighbourhood, networks of seasonal drains nevertheless rely on connections into primary drainage networks. However, as these have been the responsibility of the state, they are often far and sparse. In neighbourhoods where initiatives in temporary drainage lack coordination, their outlets jeopardise the security of clusters of households living on depressed sites. Neighbourhood youth CBOs and their support NGOs have been at the forefront of initiatives aimed at coordinating networks of seasonal temporary canals within and across Pikine's neighbourhoods.[105]

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[103] Inf. int. with gen. secretary of *Comité Local de Gestion des Inondations*/Comité de Coordination*pour le Développement de Guinaw Rail*, GRN 12 October 2014
[104] Inf. int. with gen. secretary of *Comité Local de Gestion des Inondations*/Comité de Coordination*pour le Développement de Guinaw Rail*, GRN 12 October 2014
[105] Int. with NGO senior staff member, DSM 09 July 2012

PICTURE 11: CBO MEMBERS PREPARE TEMPORARY DRAINAGE CANALS
CBO INTERVENTION IN DSM BEFORE THE 2013 RAINY SEASON
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 12: MANAGEMENT OF WATER IN TEMPORARY DRAINAGE CANALS
SOURCE: CBO FACEBOOK PAGE UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

5.3.1. Coordinating seasonal drainage within and across neighbourhoods

Coordination of neighbourhood-level temporary open drainage canals has been one of the principal preoccupations of community-based organisations and their support NGOs. Coordination has been key for two reasons: firstly, to ensure effective drainage and secondly, to reduce intra- and inter-neighbourhood competition and conflicts among residents and CBOs.

In 2009, one of Pikine's local NGOs established a coordination network of neighbourhood youth CBOs in the commune of Diamaguène Sicap Mbao (DSM). The aim was to coordinate activities around the production of seasonal (temporary) open drainage canals within and across neighbourhoods.[106] In DSM, a platform was established by the local NGO and a network of youth CBOs with the aim to coordinate local drainage interventions using a participatory planning methodology. CBOs were encouraged to hold community consultations in order to assess needs, prepare community infrastructure maps and develop participatory action plans with budgets to support their actions, including maintenance of the networks. Through the process, CBO members engaged closely with the *délégués de quartier* (formal neighbourhood leaders), local government authorities and relevant state agencies. The network's first regional meeting in 2009 kick-started this process of community preparedness (EVE 2009). In 2011, additional youth associations in DSM joined the network. At this stage, organising in wider networks across DSM was meant to ensure information sharing and consensus building before and during the summer season when stress and conflicts had been known to increase.[107]

In the commune of Guinaw Rail Nord (GRN), a number of NGOs partnered with the local government. In 2011, a voluntary Flood Committee was created under the auspices of the local mayor.[108] It tapped into an existing structure of voluntary neighbourhood representatives through which it was able to mobilise residents.

[106] *Ibid.*
[107] Project meeting with local CBOs and partner NGO during preliminary fieldwork, DSM 03 July 2012
[108] Inf. int. with president of the *Comité de Coordination pour le Développement de Guinaw Rail*, GRN 12 October 2014

In 2013, the Committee benefited from intermittent governmental and individual funds, which it used to pay for the rental of a professional excavator machine, thus improving the quality and size of temporary open drains. For executive members of the Flood Committee, the possibility of using large machines rendered interventions efficient and less complicated to coordinate.[109] Ironically, the use of machines, rather than reliance on coordination of labour previously provided by community volunteers, led to the exclusion of a large number of youth who had previously felt valued. The Committee's unilateral action led to a disengagement of a part of local youth and temporary loss of constructive relations between them and the local authorities.[110]

5.3.2. Grounding seasonal drainage networks

In the communes of DSM and GRN, seasonal open drainage canals served as a basis for permanent underground secondary infrastructure.[111] However, it was not until after the floods of 2012 that the civil society organisations and local governments were getting involved in this transformation.

In early 2014, the first NGO-led underground drainage project was commissioned and constructed in DSM. The NGO secured funding from an international donor and the Ministry of Upgrading and Redevelopment Flood-Affected Zones (MRAZI).[112] The canal was built after consultations with the national sanitation agency (ONAS) and it was harmonised with requirements set out in Dakar's Drainage Masterplan. During the period of my fieldwork, construction of the first underground segment was terminated, servicing one neighbourhood. However, during heavy rains of 2015, the canal flooded the neighbourhood as it

[109] Inf. int. with president and general secretary of *Comité Local de Gestion des Inondations*, GRN 09 September 2014
[110] Inf. int. and neighbourhood visit with two residents/community volunteers, GRN 30 June 2014
[111] Site visit with general secretary of *Comité Local de Gestion des Inondations/Comité de Coordination pour le Développement de Guinaw Rail*, GRN 15 October 2014
[112] Inf. int. with NGO senior staff member, DSM 11 November 2014

regurgitated large volumes of water after a break-down of a large state-managed pumping station.[113]

In the commune of GRN funds were allocated through MRAZI in 2014 and a private construction company was commissioned by the local Flood Committee and representatives of the local government to transform two major seasonal open canals into underground drainage, connecting inner neighbourhoods to primary drainage infrastructure.[114]

These sporadic interventions represented neighbourhood-level actions long anticipated by state agencies who had envisaged that secondary and tertiary drainage infrastructure be eventually built by local governments and civil society groups. This reflectino started in 2013 under the auspices of the government's drainage project, the PROGEP: in four of Pikine's communes, CBOs were to be recruited to oversee the transformation of seasonal drainage into formal secondary and tertiary drainage connected to primary infrastructure.[115,116] By the end of my fieldwork, no formal engagement of CBOs had been agreed, but a mechanism was put in motion to by a government-contracted NGO to start coordinating with the CBOs. Additional data about the PROGEP project is presented in chapter 6.

Nevertheless, by 2012, financial mechanisms to support NGO- and CBO-led underground drainage projects remained negligible compared to resources dispensed by cooperatives of more affluent house owners and corporate associations.[117] Middle-income residents were able to muster private capital in order to finance both technical documentation and construction of block connections. In DSM, an association of 800 residents and business owners who

[113] Youth CBO executive member/community development agent, DSM 07 March 2016
[114] Inf. int. with president and general secretary of *Comité Local de Gestion des Inondations*, GRN 09 September 2014
[115] Int. with senior project technical manager at *Agence de Développement Municipal* (ADM), Dakar 11 June 2012
[116] The project PROGEP is discussed in the following chapter.
[117] Int. with senior project technical manager at *Agence de Développement Municipal* (ADM), Dakar 11 June 2012

lived within 500m from one of Pikine's main serviced roads collected 50 000 fcfa (ca. £50) per household: capital which allowed them to commission the plans and the construction of an underground drainage canal leading to primary drains situated under the road.[118]

5.4. Ensuring solid waste collection

5.4.1. Rethinking the links between waste and flood risk

For members of the youth CBO, keeping a neighbourhood clean has been at the heart of their fight against inundations. As emphasised in the previous chapter, waste tipping and flooding are closely intertwined: sites made dysfunctional through long-term flooding or permanent waterlogging are used by local residents as dumping sites.

> One of the reasons for recuperating such land for a park is to prevent local residents from using it as a dump site. With the financial support of an NGO, the youth CBO set up a domestic waste pre-collection service. [...] According to the CBO's coordinator for flood action and the president of the CBO, keeping neighbourhoods clean is essential in fighting inundations. For them, the issue relates to public health. They also aim to discourage households from disposing of waste in flooded houses and other deserted unguarded spaces.[119]

Since 2010, one of the goals of the local youth CBO has been to raise awareness about the links between solid waste mismanagement and the worsening of conditions associated with flooding and permanent waterlogging. The CBO's initiatives often involved awareness campaigns through which CBO members tried to change household practices and prevent tipping in abandoned water logged areas. However, occasional campaigns alone have been unsuccessful in preventing dumping. Likewise, large neighbourhood cleaning actions, referred to as the *Set Setal*, have brought only temporary short-lived improvement although they have been invaluable in creating a collective sense of responsibility. In a

[118] Int. with NGO senior staff member, DSM 09 July 2012
[119] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014

popular tradition in Senegal, large cleaning actions are organised sporadically by local youth CBOs. Local residents are invited to participate in advance and the action takes place with the accord of the neighbourhood authorities, the *délégué de quartier. Set Setal* actions are paid for from financial contributions fundraised from local residents and from a CBO's treasury which relies on membership fees. A CBO provides its own or rented cleaning gear such as rakes, bags, gloves, wheelbarrows, machetes to cut reeds and containers and CBO members manage the transport and disposal of collected waste. Some CBOs rent large sound systems and use music to motivate local residents to join and keep energy high during the events, which usually lasts 2-4 hours. Such events are also understood as occasions for socialisation. They are an opportunity to see one's peers from the wider neighbourhood, to laugh, tease one another, flirt. They are also occasions for young women to freely choose their work clothes and push the boundaries of commonly accepted dress-codes, and thus the boundaries of what is traditionally promoted as the good Senegalese woman.

Set Setal actions are regular happenings in Pikine, but the frequency across zones differs and testifies of the degree of youth organisation. A complementary approach, described in the following section, has relied on systematic collection of waste in under-serviced areas.[120]

[120] Particip. obs. at NGO-led training session on dev. of youth CBO project proposals, DSM 18 September 2014

PICTURE 13: CBO MEMBERS PARTICIPATE IN A S*ET SETAL* CLEANING ACTION (2013)
SOURCE: AUTHOR, DECEMBER 2014

PICTURE 14: CBO MEMBERS AND RESIDENTS PARTICIPATE IN A *SET SETAL* CLEANING ACTION BEFORE THE RAINY SEASON OF 2013.
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 15: CBO MEMBERS AND RESIDENTS PARTICIPATE IN A *SET SETAL*
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 16: CBO MEMBERS AND RESIDENTS PARTICIPATE IN A *SET SETAL*
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 17: STREET CLEANNING BY CBO MEMBERS AND RESIDENTS
PARTICIPATING IN A *SET SETAL* (2013).
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 18: COLLECTION OF SOLID WASTE IN ABANDONED HOUSES
BY CBO MEMBERS AND RESIDENTS PARTICIPATING IN A *SET SETAL* (2013).
SOURCE: CBO FACEBOOK PAGE UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 19: CBO MEMBERS AND RESIDENTS HAVING FUN DURING A *SET SETAL*
SOURCE: CBO FACEBOOK PAGE UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

PICTURE 20: CBO MEMBERS AND RESIDENTS EVACUATE WASTE AFTER A *SET SETAL*
SOURCE: CBO FACEBOOK PAGE UPLOADED IN SEPTEMBER 2013. ACCESSED ON 10.12.2016

5.4.2. Developing CBO-managed waste pre-collection schemes

Since 2010, a number of youth CBOs in DSM have been working with a local NGO to reinforce small neighbourhood waste pre-collection schemes.[121] Pre-collection refers to house-to-house waste collection provided as a service by neighbourhood CBOs. Due to difficult access in the narrow sandy streets of Pikine's neighbourhood, pre-collection is done manually, using horse-drawn carts managed by the CBOs. CBO members liaise with a private service contractor licensed by the local government to provide communal waste collection. The CBO collects waste from households and deposited it regularly at a dedicated transfer site from which it is off-loaded by the private contractor.[122] The role of the NGO is to motivate youth CBOs to engage in the network, support them at the start of their activities by providing credit for the necessary material purchases (horses, carts, bags, gloves, *etc.*) and help set up an accountancy model which allows the CBOs to cover their running costs, salaries and if desired, a scheme to subsidise the costs for select low-income households.

In 2015, some 1 250 houses subscribed to the service offered by just one of the youth CBOs engaged in this programme across the case study area in DSM. The CBO set a monthly fee per household at 1 500fcfa (*ca.* £3.50).[123,124] It divided its revenues into four parts: one part was used to reimburse the cost of material which was initially paid for by their support NGO. A second part constitutes the wages of 27 waste collectors—young men who are members of the CBO. Employment creation is deemed central to the CBO's communitarian approach. The third part is used to the cover costs of pre-collection for selected households who had been identified by the CBO as "extremely poor" and were thus elected for a subsidy. Members of the CBO showed great pride in operating as a social enterprise. The fourth part of the budget was used to support the organisation's

[121] Inf. int. with NGO senior staff member, DSM 11 November 2014
[122] Particip. obs. at NGO-led training session on dev. of youth CBO project proposals, DSM 18 September 2014
[123] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016
[124] Average monthly household income in Dakar may was as low as 18 260FCFA (Kuepie 2004), whereas it is often bracketed between 24 000FCFA and 64 000 FCFA (Enda Tiers Monde 2009).

commitments related to flood risk reduction. In the past, such funds had been used to maintain and refuel motor pumps and to provide emergency support to extremely vulnerable households.[125]

Nevertheless, it took an externally led consultation process for the CBO to become aware of some inherent inconsistencies in its neighbourhood pre-collection scheme. The site chosen for transfer of domestic waste onto the contractor was located within a local marketplace partially dysfunctional due to inundations. On the one hand, this choice seemed in conflict with the CBO's ethos about neighbourhood cleanliness and the importance of local employment.[126] On the other hand, it showed the pervasive nature of the very attitudes the CBO itself endeavouring to change. The CBO faced additional criticism from women who had expressed interest in being employed as waste collectors side-by-side with the young men.[127] Whereas household-level waste management is traditionally the responsibility of Senegalese women, employment in the waste sector is commonly said to stigmatise women, due to its execution in the public space. At a focus group discussion session in DSM, women refused such views and reproached the youth CBO for maintaining an inequality whereby women were expected to carry out the unpaid tasks in domestic waste disposal while men managed the collection and benefited from employment opportunities. The discussion corroborated Fredericks' (2009) findings in Dakar, that women were often indirectly blamed for the waste crisis, but had difficulties accessing paid employment in the waste sector.

[125] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014
[126] Particip. obs. at NGO gender training workshop (D3), DSM 14 November 2014
[127] Particip. obs. at NGO gender training workshop (D2) and FGD, DSM 13 November 2014

5.5. Recovering public space for work and leisure

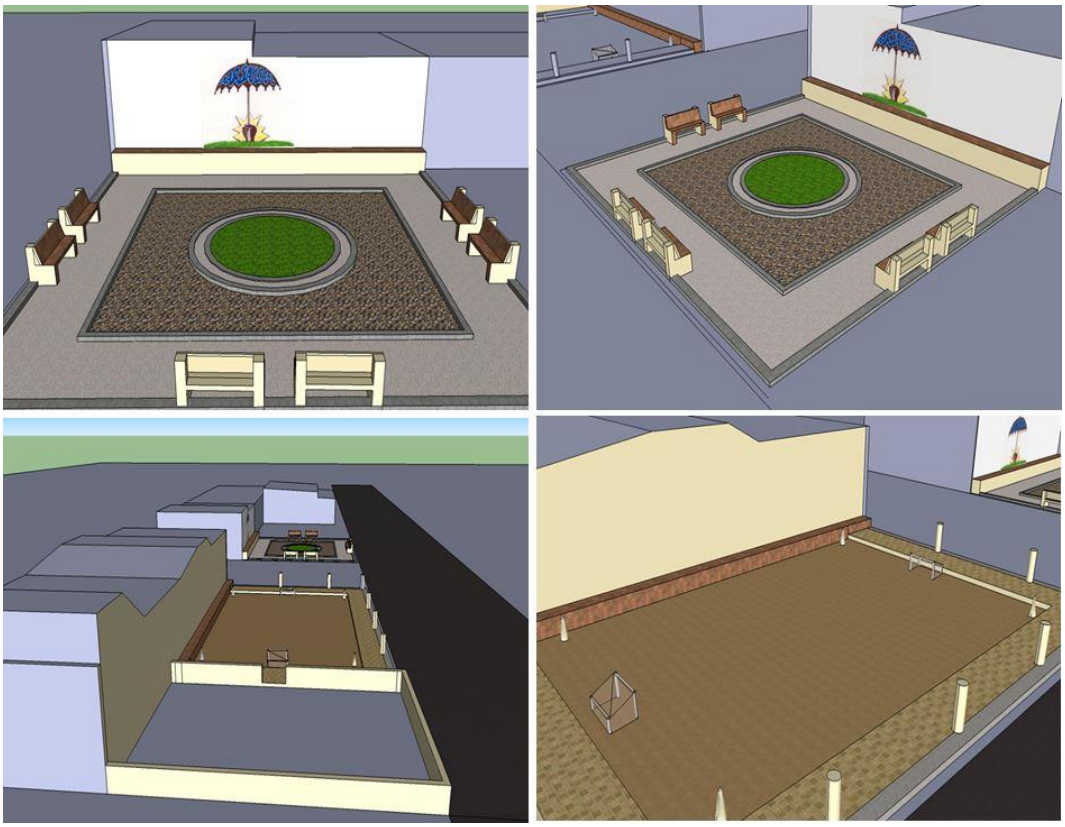
In 2014, a new project undertaken by the youth CBO in DSM was conceived, based on a new conceptualisation of flood risk. The members' daily experience showed that dysfunctional—and consequently ambiguous—spaces invited risk-increasing practices. Complementing their activities in waste pre-collection, the youth CBO developed an initiative proposing to modify land use within the neighbourhood. They recovered a small desolate water-logged site which had been in disuse since 2005 and redeveloped it as a public meeting place. The youth referred to their project as the Park. The project was part of a larger initiative consisting of 17 micro-projects projects redeveloping small public spaces within residential neighbourhoods. The projects were implemented by a network of 20 youth CBOs and supported by local and international NGOs.[128] These projects, which were initially conceived as civic engagement interventions, were geared to deepen youth participation in urban governance through direct involvement in the improvement of their neighbourhood.

The plot of land in DSM designated for the Park ran along a major road which had been constructed in 2003 as part of a state-led neighbourhood upgrading programme. The road became permanently flooded and made dysfunctional after the floods of 2005. It remained engulfed by domestic waste and open sewage deliberately leaked from the surrounding houses. The aim of the Park was to remedy the situation and create a safe public space for socialising.

[128] Particip. obs. at NGO-led training session on dev. of youth CBO project proposals, DSM 18 September 2014

PICTURE 21: IMAGES BEFORE AND AFTER THE PARK PROJECT
AS ADVERTISED ON THE CBO'S FACEBOOK PAGE.
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN APRIL 2015. ACCESSED ON 10.12.2016

PICTURE 22: IMAGES OF SELECTED ACTIVITIES DURING THE PARK PROJECT
AS ADVERTISED ON THE CBO'S FACEBOOK PAGE.
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN APRIL 2015. ACCESSED ON 10.12.2016



PICTURE 23: VISUALISATIONS OF THE PARK PROJECT AS DESIGNED BY MEMBERS OF THE CBO
SOURCE: CBO FACEBOOK PAGE, UPLOADED IN APRIL 2015. ACCESSED ON 10.12.2016

The following field notes capture occasions when the purpose of the Park was explained to various audiences.

> During this first meeting, C. showed me the first site for the Park. One of the reasons for recuperating such land for a public park is to prevent local residents from using it as a dump site.[129]

> Group 1: One of the youth CBOs in Diamaguène Sicap Mbao proposed a project, which involves acquisition of abandoned flooded land on which they want to set up a Park.[130]

For the youth CBO, the principal motivation for the project was to demonstrate that well managed public space could be used to bring together diverse groups across the neighbourhood. Speaking to a group of women gathered at the

[129] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014
[130] Particip. obs. at NGO-led training session on dev. of youth CBO project proposals, DSM 18 September 2014

occasion of a workshop focussed on addressing local gender issues, one of the CBO's executive members explained:

> We would first like to present to you the project which consists of redeveloping abandoned spaces. Our objective is to recuperate a plot of land situated along the road behind M.'s house and transform it into a public space for socialising where children can play in security without having to travel to playground in the Sicap on the other side of the highway.[131] Also, where adults and elders can relax or welcome their guests without having to leave the neighbourhood.[132,133]

By the end of 2014, the Park project had served to raise awareness about risks inherent in waste tipping and open sewage leaks. The youth CBO encouraged its users—elders, school children, women's groups—to advocate against waste tipping and illicit sewage leaks.

The CBO's decision to target sewage leaks coincided with their new reconceptualization of flood risk. CBO members were increasingly conscious of a difference between flooding and waterlogging as well as the link between waterlogging and increased levels of groundwater. Untreated waste water constituted a large part of permanent waterlogging.[134] This conception of risk marked an important change in their framing of 'flooding' in Pikine: the reconceptualization dissociated flooding from seasonal rainfall and posited it as an outcome of a failed urban water cycle. Leaders of the CBO sympathised with other civil society organisations who had advocated for an understanding of Dakar's water cycle as extending beyond the boundaries of the city and dissociated from seasonal rainfall.[135] These organisations campaigned for the

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[131] The SICAP is a zone in DSM consisting of a number of neighbourhoods seen as middle-class, better-off, formal. It is a residential area planned and constructed by a major real-estate developer present in Senegal since 1950

[132] FGD with female residents and community volunteers, evaluation of CB-DRR project, DSM 05 January 2015

[133] Sicap Mbao is a planned residential estate located some 15min across a major highway road.

[134] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24-25 April 2015

[135] Informal Inf. int. with the president of a youth CBO during an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24 April 2015

reopening of urban boreholes which had been formally closed between 2001 and 2004. They demanded that the urban agriculture and gardening sectors revert to using groundwater for irrigation purposes, rather than drawing water from Dakar's stretched drinking water network, which relies exclusively on a natural reserve located 200km north of Dakar. Simultaneously, they argued that the urban agriculture and gardening sectors put extensive pressure on the city's drinking water system and disregarded existing opportunities to contribute to the reduction of Pikine's environmental and flood risk. This argument was highly relevant for the youth CBO given that such systemic change implied that waterlogging would be diminished and, by extension, septic tanks in low-lying neighbourhoods would be rendered functional.

Unable to address sanitation issues and sewage leaks directly, the youth CBO chose to intervene through land use change, bestowing a new function on polluted land. The Park project reduced opportunities for risky practices and served as an occasion to hold public discussions about intentional leaks of grey and black water, which came to constitute a basis for the CBO's advocacy against this practice.[136,137]

Based on a formative evaluation of the youth groups' projects, the social impact of the Park project was as follows: as a new space for socialisation, it was immediately accepted and used by local residents, catering for different age and interest groups at different times of the day.[138,139] Although waterlogging of the road in its vicinity has not been resolved, the Park helped in creating new pedestrian paths though the partially recovered neighbourhood. A densified

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[136] *Ibid.*

[137] Informal Inf. int. with the president of a youth CBO during an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24 April 2015

[138] A formative evaluation is often equated to mid-term evaluation (as opposed to a final, summative, *ex post* evaluation). The purpose of a formative evaluation is to assess progress to date, identify obstacles and integrate findings into planning and implementation at latter stages. In this case, the evaluation was undertaken by the CBOs' support NGO, and it served an important additional purpose, that to provide an occasion for exchange among youth CBOs whose projects were at different stages of the planning/implementation cycle.

[139] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24-25 April 2015

street network made previously segregated residential areas more easily accessible. Having reconnected neighbourhoods through pedestrian movement via the Park, the project contributed to the improvement of the security of the area. Finally, the youth CBO used the Park project in order to secure a reconnection of public street lighting, a service which they negotiated with the local government.

Nonetheless, just as it had been the case for the CBO's waste pre-collect scheme, the Park presented an inherent contradiction. Recovering the site was made possible through intensive infilling – *remblai.* Whereas the CBO was generally critical of this practice, its leaders and its support NGOs took the gamble of possible dislocation of large volumes of contaminated stagnant water, putting at risk surrounding houses in the surrounding neighbourhoods.

This chapter elaborated on the evolution of CB-DRR interventions looking to understand how thinking which underpinned collective action evolved with the actors' experience of risk in Pikine's urban neighbourhoods. I documented how a youth CBO's conception of urban flood risk reflected their concerns for social cohesion, duration of emergency flood periods, youth unemployment and neighbourhood-level safety. The following chapter examines community initiative in broader interaction with city-level urban development processes. I revisit the youth CBO's Park project, but to show that this small CB-DRR initiatives is equally relevant for the domain of urban development policy and planning.

6. CB-DRR IN ITS BROADER URBAN DEVELOPMENT CONTEXT

6.1. Introduction

When speaking of causes and solutions to neighbourhood-level flooding, local residents frequently refer to neighbourhood upgrading: *restructuration* (fr.). The following sub-chapter aims to understand the link between neighbourhood upgrading, local flood risk and wider urban development policies. What is the nature of initiatives and interventions which fall under the rubric of neighbourhood upgrading? How do different approaches to neighbourhood upgrading influence possibilities opened to residents in the future? I show that neighbourhood upgrading interventions vary in their characteristics and that they produce a multiplicity of conditions in which local residents and CBOs act to reduce flood risk. I examine the link between CB-DRR and upgrading programmes in three of Pikine's communes, demonstrating that although all three followed an official upgrading model, the goals and outcomes of these interventions were highly disparate. Positioning the analysis at the level of a commune makes it possible to appreciate how urban change intersects with CB-DRR. The perspective allows an analysis of CB-DRR not as short-term punctual actions, but as medium-term processes, through which community actors periodically interact with higher level institutions.

The chapter is structured in three parts, providing examples of three communes in Pikine. Each of the communes has been severely affected by seasonal flooding and long-term waterlogging. Each was the site of a different state-led urban development project which comprised elements of participatory neighbourhood upgrading. Firstly, I discuss the case of the Park project in the commune of Diamaguène Sicap Mbao (DSM) because it constituted my primary fieldwork site. People in DSM often spoke of neighbourhood upgrading (Fr. *restructuration*) as the ultimate panacea to flooding. It was these conversations which made me attentive to the theme of *restructuration*. The second example presented in this chapter was constructed during the process of writing up this thesis. Early during my fieldwork, I came to know about a local NGO working in the commune of

Djiddah Thiaroye Kao (DTK), but due to excessive competition among local NGOs in Dakar, the initiative was not frequently mentioned. Later, at closer inspection, it transpired that it was an urban planning initiative with deep participation at its heart. It attracted my interest further when I realised that the project co-evolved with one of the principal state-led flood risk reduction programmes in Pikine. The third example, staged in the commune of Guinaw Rail Nord (GRN), brings into focus a controversial transport infrastructure project. At the early stages of my research, in 2012, a new toll highway project was just about to finalise the construction of a major segment cutting through Pikine. I had intentionally avoided the subject of the highway as I deemed it another research project altogether. However, once I had acknowledged the importance of neighbourhood upgrading projects, it became imperative to include the highway project in the present study; an intensely debated component of this transport infrastructure project was its proposition to upgrade neighbourhoods in the vicinity of the highway. I had the choice of studying the highway project in one of five communes bisected by the road. I opted for GRN where I had already undertaken interviews related to community drainage.

I made a choice of excluding from my analysis of neighbourhood upgrading the issue of resettlement and the resulting process of urban expansion. Each of the three upgrading interventions analysed in this chapter involved some degree of resettlement and as such contributed to the expansion of Dakar's urbanised region. The new resettlement zone represents a new stage in the city's evolving landscape of risk. Likewise, residents of the new neighbourhoods have a very different capacity for community action. Issues pertaining to the new resettlement zones were beyond the scope of the present research project.

Data collected for the three sites varied: the first location in DSM was a zone of my principal fieldwork and data was primarily based on participant observation. Data for the second site in DTK comes from interviews and document analysis. Finally, data for the third site in GRN was combined from focus group discussions, interviews and site visits.

6.2. Neighbourhood upgrading before and after flooding in DSM

The first example outlines the history and principles of neighbourhood upgrading in Pikine's commune of Diamageune Sicap Mbao (DSM). It discusses the organisational set-up and procedures which became the formal basis for participatory neighbourhood upgrading in Senegal. It then shows how, over the past 15 years, the nature of upgrading changed from large-scale state-led projects to incremental interventions involving multiple partners. In this context, new generations of community organisations reimagined urban development, neighbourhood upgrading and their role in such processes.

DSM is the largest of Pikine's communes and it is divided into 78 neighbourhoods. Its population in 2013 was 128 512 (ANSD 2015a).

6.2.1. The official model for participatory neighbourhood upgrading, its procedures and institutions

Until 1986, the predominant government policy to manage urban growth in Dakar was to forcefully evict residents of informal settlements into zones further east on the urban periphery (Álvarez de Andrés et al. 2015; Verniere 1977). From 1987 until 2005, the German development agency GTZ (later GIZ) supported the Government of Senegal in exploring an alternative approach to housing policy and urban development (World Bank 2002). A pilot project was run in the commune of Dalifort between 1987 and 1990. In 1991, the approach became formalised in a presidential Decree which set out the basis for participatory neighbourhood upgrading (fr. *restructuration)* and conditions for regularisation of land in informal settlements (GoS 1991). Upgrading and land titling were concerned with the public domain and they were thus initially conceived as a state-led project.

Involvement of local residents in neighbourhood upgrading was twofold: it was envisaged that they participate in the spatial planning process and that they contribute to a cost-recovery mechanism (covering the cost of upgrading works and the cost of land). Neighbourhood upgrading consisted primarily of provision

of infrastructure for drinking water, electricity and roads (secondary and tertiary connections).[140] Drainage and some provision for sanitary infrastructure remained among the key declared priorities, but never made it to the execution list.

From 1998, neighbourhood upgrading interventions were formally linked to a land regularisation process. Residents of informal settlements officially designated for urban upgrading were thereby eligible for delivery of a title deed called the Right of Land Occupancy (*Droit de Superficie*). Acquisition of the title was conditioned by a household's financial participation which included the cost of the plot and the cost of infrastructure works comprised in upgrading. Once a title was acquired, the owner remained a lawful occupant for 50 years, with no option to sell the plot (World Bank 2002). This regularisation process was hailed as a highly innovative urban approach in West Africa, but there is evidence that it failed to produce its desired result. Few residents concluded their repayment plan, their contract with the state did not succeed in preventing the sales of plots through the informal land market, nor did it significantly improve the socio-economic situation of the resident households (Payne et al. 2008; World Bank 2002).

In order to manage upgrading locally, residents of communes designated for upgrading were required to form distinct CBOs, the *GIE de restructuration.* The *GIE* acted as a link between the residents, the financial institutions and the state as well as it managed the financial repayment plan of each of its members.[141] Each *GIE* elected its executive committee, thereby subscribing to the logic of participatory development and democratic representation (FDV 2004a; FDV 2005). The year 2000 was marked by major changes in the government and the election of a new president. A new delegated para-statal agency, the *Fondation Droit a la Ville* (FDV), was established in 2000 with a mandate to develop and manage projects in urban upgrading and land regularisation. Given its legal status,

[140] Int. with two senior staff members and upgrading experts, Fondation Droit a la Ville, Dakar 03 December 2014

[141] A GIE stands for *Groupement d'intérêt économique,* which broadly equates to a form of SME. However, a *'GIE de restructuration*' manages and uses its funds (savings) exclusively purpose of upgrading and land regularisation.

and tutelage of the Ministry of Urbanism (*Ministère de l'Urbanisme et de l'Aménagement du Territoire*), the agency's mission was to implement projects of public interest and raise capital from private and public sectors. A user manual published by the agency in 2004 provided a standard operational list of nine steps for the process of *restructuration* (FDV 2004b):

- Delimit a neighbourhood
- Elaborate a topographical base study of the neighbourhood
- Undertake a real-estate study
- Develop a detailed neighbourhood/area plan (*Plan d'Urbanisme de Détail*)
- Develop an information campaign and embark on a process of awareness raising among local residents
- Undertake a census of local population and housing
- Elaborate and validate a list of beneficiaries
- Formalise the status of beneficiaries through membership in formal organisations – *GIE de restructuration,* designated by law for the purpose of upgrading and land titling
- Create a supervisory committee (council of wise men)

Ten years later, no significant changes have been made to this formal procedure guiding *restructuration* and land titling in informal settlements.[142]

6.2.2. The reality of neighbourhood upgrading and regularisation in DSM

In the commune of DSM, the programme led by GTZ started in 1991.[143] Technical committees were formed, coordinating local technical experts, international consultants, deconcentrated state authorities, neighbourhood leaders and selected residents-members of the local *GIE*s.[144]

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[142] Int. with NGO staff member, Dakar 07 February 2016

[143] Inf. int. with local resident*/délègue de quartier/* president of a *GIE de restructuration*, DSM 02 December 2014

[144] The programme started before the advent of decentralised local government in Senegal. Local elected authorities were established by law in 1996. Their absence during the early years of the

The commune and its 78 neighbourhoods were divided into 16 sub-zones which were mapped and re-planned in order to accommodate key facilities and connect neighbourhoods to the wider primary transport network. A local market place, schools and a community centre, connected by two new major roads, were proposed through the planning process. Within neighbourhoods, enlargement of a number of streets was agreed, facilitating passage through the densely built quarters. Small pedestrian paths, tertiary communications, were traced between the houses. When recollecting about the works, residents recalled that extensions of drinking water infrastructure and electricity has been the most important contributions of *restructuration*.[145, 146]

The formal land regularisation process offered residents the possibility to purchase surface titles at a price of 1500 FCFA/m^2 (£2.50). Parcels ranged from between 300m^2 to 100m^2. Although the tariff has since remained fixed, the rate of payment has remained very low.[147] By 2014, in one of the upgrading sub-zones, less than one quarter of the 1050 parcels had been fully repaid by their occupant, and even these households were still waiting to receive their formal Right of Land Occupancy (*Droit de Superficie*).[148]

On-site resettlement of households adversely affected by works on neighbourhood upgrading was officially a priority within the upgrading methodology. In practice it proved to be a highly challenging task.[149] From the beginning of the upgrading programme, most households affected by upgrading works were resettled in phases on a designated site in the commune of Keur Massar, located some 5km on Pikine's urban periphery. Nevertheless, between

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upgrading programme was later reflected in conflicts with leading members of the GIE. This issue is discussed in chapter 7.

[145] Inf. int. with local resident*/délègue de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

[146] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016

[147] Inf. int. with a long-term resident/CBO secretary general/deputy *délégué de quartier*, DSM 26 September 2014

[148] Inf. int. with local resident/ *délégué de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

[149] Int. with two senior staff members and upgrading experts, Fondation Droit a la Ville, Dakar 03 December 2014

2000 and 2004, in spite of incentives in the form of land in adjacent communes, some households refused to leave their parcels.[150]

6.2.3. Neighbourhood upgrading in relation to flood risk

When plans for upgrading of Diamaguène were revisited by the agency in 2002, none of the zones concerned by the works had problems with flooding; by the end of 2005, all of them suffered from flooding and water has since remained in many of the neighbourhoods.[151] According to long-term employees of the agency FDV, specialised in neighbourhood upgrading, between 2001 and 2005, increasing population density resulted in mounting volumes of used water being released into the ground. Around the same time, ten of Pikine's major urban bore holes were closed, after it was officially confirmed that groundwater had become critically polluted and unsuitable for use. No solution was provided to maintain a balance in Pikine's groundwater levels.

During its first phase of operations in DSM, the para-statal agency FDV, considered to be a specialist in *restructuration,* rehoused some 400 families within a resettlement site Keur Massar I, some 5km east of the original neighbourhoods.[152] Land recovered in DSM became government land managed by the agency FDV. In 2004, after the conclusion of neighbourhood upgrading works, the agency kept its office in DSM in order to provide support for the ongoing regularisation process. Its long-term presence in the area made it inevitable that it became an actor in the process of local environmental change after the floods of 2005.

From summer 2005, long-term waterlogging fragmented neighbourhoods which had hoped to be able to reach the stage of consolidation promised by the upgrading project. According to residents of DSM, rumour has it that it was the newly built paved roads completed by 2004, which prevented the draining of rain

[150] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016
[151] Int. with two senior staff members and upgrading experts, Fondation Droit a la Ville, Dakar 03 December 2014
[152] *Ibid*.

water across entire neighbourhoods.[153] Local planning and infrastructure professionals confirmed that the secondary road network built by FDV was originally designed with its own drainage but that this provision was overlooked during its implementation.[154] Some have argued that the cost-recovery requirement stipulated in the official upgrading model, made it financially unfeasible to install drainage and sanitation infrastructure in spite of these being officially promoted as key components of upgrading interventions. (World Bank 2002). This was to the residents' great dismay, given that drainage and sewage infrastructure had been included in the original plans co-designed during the early planning sessions in the 1990s by the *GIE*, local leaders and technical experts.[155,156] The malaise was exacerbated by the fact that large sections of at least two major intercommunal roads built by the agency FDV became permanently flooded. These roads remained dysfunctional at the time of my fieldwork in 2014. Such conditions have had significant adverse effects on the connectivity of the numerous neighbourhoods. Businesses along the axes have stagnated. Extension of the public transport system was dropped and, as a consequence, transport to/from this residential zone became monopolised by an industry of informal collective taxis providing connections only at short distance. Resident women and girls emphasize that taxi stations scattered across the neighbourhoods are frequented by strangers and perceived as dangerous and they are therefore cautiously avoided.[157]

Finally, severe long-term waterlogging made it impossible to keep the promise of *in situ* resettlement of households affected by upgrading works. Most potentially available unbuilt parcels became flooded and their condition deteriorated rapidly when surrounding houses embarked on *remblai*. Critical conditions after the summer rains of 2005 equally tipped the situation of households who had initially refused to be rehoused in the resettlement zone managed by the agency FDV in

[153] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016
[154] Part. Obs. at a project proposal writing workshop with two local NGOs, Dakar, 22 February 2016
[155] Particip. obs. at a project proposal writing workshop with two local NGOs, Dakar 22 February 2016
[156] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016
[157] Inf. int. with two youth CBO members, DSM 27 November 2014

Keur Massar I (KM). A second phase of resettlement into KM thus took place after 2005, but by then, many of the remaining available plots were already known to be at risk of waterlogging. Families were thus resettled from one flood-affected site to another.[158]

6.2.4. Local legacies of upgrading projects

Redeveloping the wetland lake of Sam Sam

State intervention through upgrading projects and long-term presence of the agency FDV led to the circulation of numerous rumours and unconfirmed promises among local residents, suggesting that more flood mitigation measures would be undertaken by the government. As a consequence, local leaders and CBOs remained passive, awaiting the government's future steps. One such case in point concerns rumours about future upgrading of the wetland lake of Sam Sam (*Mare de Sam Sam*). The wetland had been settled during the exceptionally dry period of the late 1970s. Risk of periodic waterlogging caused by increasing groundwater levels has since been imminent but it was in 1998 that residents of the zone experienced a first flood emergency. In 2002, the agency FDV started its programme in DSM by re-housing all of the wetland's residents onto a site in Keur Massar I.[159,160] The wetland has since varied in size during the dry and wet seasons, and water has regularly taken over the surrounding houses, primary schools and mosques.[161]

Residents of adjacent neighbourhoods believe that a major redevelopment programme is in the pipeline whereby the state will recover the land and will convert it into new residential quarters. At stake is also the functionality of two large primary schools: a state-run school which has intermittently been closed over the past years and a school established by a religious charity. Unconfirmed

[158] Inf. int. with local residents/members of CBO executive committee, DSM 08 February 2016
[159] Int. with two senior staff members and upgrading experts, Fondation Droit a la Ville, Dakar 03 December 2014
[160] Inf. int. with local resident*/délègue de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014
[161] Particip. obs. and site visit during an internal regional workshop of an INGO, Dakar 22 April 2015

declarations about the future of this large water-affected area creates a paralysis and an atmosphere of distrust in which residents, community leaders, NGOs and the local government find themselves in a protracted freeze.[162,163] My own analysis of policy and planning documents which have addressed the future of this wetland lake suggests that although desired, no intervention that could bring significant improvement to the current conditions has been planned in the foreseeable future. Dakar's 2012 Drainage Masterplan (*Plan de Directeur de Drainage*) indicates that the lake should eventually be reclassified as a natural water retention basin. The basin would be connected to a new drainage network which would allow some control over its behaviour. The Drainage Masterplan is implemented through multiple piecemeal public investment programmes. A programme entitled the *Projet de Gestion des Eaux Pluviales et d'Adaptation au Changement Climatique 2013 - 2017* (PROGEP) targets a set of priority communes designated for the installation of primary drainage infrastructure. However, DSM and the vicinity of the Sam Sam wetland lake are not included among these priority zones.

Redevelopment of the site into a networked water retention system was also discussed in a feasibility study for the construction of a new toll highway project. However, a more recent document outlining options for the upgrading of zones in the relative vicinity of the toll road, the Resettlement Plan published in 2014 (APIX 2008; APIX 2014a), offered no further information about a future plan to redevelop the wetland and instead it proposed to defer the decision to a later date.[164] In the commune of DSM, upgrading works in neighbourhoods located the vicinity of the new toll highway started in late 2015. The works were primarily aimed at re-establishing the original network of secondary roads which had been truncated by the highway and at securitising land around new water retention

[162] Inf. int. with local resident*/délègue de quartier* /president of a *'GIE de restructuration'*, DSM 02 December 2014

[163] Raising my awareness of this issue were a number of informal requests by NGO staff that I enquire about future state interventions during my Int.s with state agency employees and share the information with local organisations.

[164] Int. with urban planner, APIX restructuration urbaine Pikine Irregulier Sud, Dakar 15 March 2016

basins implanted along the highway. The wetland of Sam Sam was not included in the works because it was deemed not to be directly affected by the highway and therefore it did not fall into the above two categories.[165]

[165] Inf. int. with NGO staff members working on community flood management, DSM 16 February 2016

PICTURE 24: ROOFTOP VIEW OF HOUSES IN THE VICINITY OF THE WETLAND LAKE OF SAM SAM
SOURCE: AUTHOR, NOVEMBER 2014

PICTURE 25: A WATER-AFFECTED PRIMARY SCHOOL ADJACENT TO THE LAKE OF SAM SAM
BEFORE THE START OF A SCHOOL YEAR, CBO MEMBERS CUT READS INSIDE THE SCHOOL'S COUTRYARD
SOURCE: CBO FACEBOOK PAGE, AUGUST 2013.

Changing the function of un-built land

Through the upgrading process, the agency FDV became a central actor in the development of neighbourhoods in DSM. It possessed an exclusive mandate to manage all public land, which had remained un-built after the resettlement of households affected by waterlogging or by the upgrading work.[166] Over a decade, residents, members of the *GIE de restructuration*, generations of CBOs and NGOs developed close personal and institutional ties with the long-term employees of the agency FDV. These relationships shaped the agency's attitude towards local initiatives. In 2012, the agency FDV was willing to consider allotting some of the land held within its portfolio in support of the residents' initiatives. Such land included plots which fell under the agency's management after the resettlement project. Two plots of land were assigned for civil society-led projects related to risk reduction. In 2012, the agency supported a first project by allocating a large terrain in the middle of a neighbourhood for the purpose of an NGO-led local condominium sewage infrastructure project. The project was conceived as a solution to sewage leaks, aiming to improve public health in the local areas (Enda Tiers Monde 2013a; Enda Tiers Monde 2013b). Although the execution of the project was long overdue and eventually it was compromised by the high groundwater table, it stands as a testament to a distinct alliance between local organisations and the state. Two years later, in 2014, the agency FDV allocated another plot of land to a youth CBO wishing to develop a small neighbourhood park. During project design sessions held by members of the CBO and its support NGO, the youth envisaged the Park as a first step for their generation's involvement in the long-term process of neighbourhood upgrading. In the logical framework developed for their micro-project, they envisaged that over the next five years the Park should contribute to neighbourhood upgrading and it should provide an opportunity to develop an advocacy campaign targeting the agency

[166] Inf. int. with local resident/*délégué de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

FDV. Advocacy targeted at multiple state agencies should address sanitation needs.[167]

[167] Particip. obs. at an NGO-led training session focussed on development of community project proposals by youth CBOs, DSM 18 September 2014

PICTURE 26: THE PARK PROJECT SITE DURING PROJECT IMPLEMENTATION
SOURCE: AUTHOR, JANUARY 2015

PICTURE 27: THE PARK AFTER THE FIRST PHASE OF PROJECT IMPLEMENTATION
SOURCE: AUTHOR, MAY 2015

One year later, a mid-term evaluation workshop was held by the NGO and the CBOs involved in the wider initiative.[168] Apart from the Park project, eight other youth projects were presented, falling into three broad categories displaying affinity with the general aims of neighbourhood upgrading. These included:

- projects aimed at reducing risk related to open water and waste tipping: changing land use of small plots within neighbourhoods in the vicinity of state built drainage infrastructure, such as ;large water retention ponds;
- projects building on earlier aspirations and initiatives by the youths' parents to improve neighbourhood public space. In the past, the parents' initiatives were inspired by the *Set Setal* civic movement of the late 1980s and early 1990;
- projects to upgrade community-level public services such as community health centres and public sports grounds.

These initiatives confirmed that, in spite of highly questionable outcomes of the official state-led upgrading programme implemented by the agency FDV, neighbourhood upgrading has remained a highly desired goal for local residents.[169] In DSM, the youth's determination signalled that the CBO conceived of itself as a legitimate actor to engage in and partner with government agencies. The outcomes of this small civic intervention in the spatial fabric of a residential zone can thus be considered as a direct continuation of the neighbourhood upgrading process.

The example of neighbourhood upgrading in DSM emphasised links between upgrading programmes, spatial change and flood risk. Systematic state-led programmes failed to bring significant positive change and, where the state had left behind latent projects, it caused paralysis among community actors.

[168] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24-25 April 2015
[169] Inf. int. with CBO members during a strategic meeting of the organisation, DSM 24 September 2014

Over time, community actors involved in neighbourhood upgrading evolved from being formal *GIE* (*GIE de restructuration*) ran by neighbourhood elders and working in close collaboration with para-statal agencies to organisations including neighbourhood youth CBOs in search of partnerships with NGOs and with the local government.

Environmental conditions in which neighbourhood upgrading takes place have also changed. Early upgrading projects led by the state aimed to shape the environment in order to create an orderly and rational urban society. More recent neighbourhood development initiatives addressed threads inherent in a physical environment which had been fractured through periodic flooding. Furthermore, the more recent projects were negotiated in a society which is sensitive to environmental and social uncertainty. It is therefore through seemingly short-term solutions that such organisations sought to reinstate normality in a context of extensive risk.

6.3. Planning drainage infrastructure in DTK

The second example of neighbourhood upgrading in the commune of Djiddah Thiaroye Kao (DTK) focuses on a civic initiative in a context where community neighbourhood development planning preceded state interventions; more specifically a community mobilisation came to serve as an attractor for a major state-led flood risk reducing programme. In 2013, DTK's population counted 96 952 residents (ANSD 2015a).[170] The commune's surface area is 2,37 km^2 and it is composed of 72 neighbourhoods, of which 66 are classified as irregular (informal) (urbaDTK 2015). The origin of the formal part of the commune dates back to the period of forced evictions from Dakar in the 1960s. Informal neighbourhoods were gradually established during the great Sahelian drought of the 1970s and grew rapidly before the early 2000s.

[170] This number is down from census data in 2002 when the population of the commune was 101 351.

6.3.1. Rebelling through participatory neighbourhood development planning

The beginnings of recurrent flooding in DTK dates back to 1989 but it was not until the floods of 2005, that DTK became one of Pikine's most severely affected communes. In 2005 and 2006, residents had been subjected to the government's emergency DRM programme *Plan Jaxaay,* which consisted of a replacement of multiple neighbourhoods with two large water retention ponds. An associated mass resettlement programme led to the relocation of thousands of households onto Pikine's periphery. In this context of such commotion, a group of local residents mobilised to express their opposition to this highly contested and politicised intervention. The residents formed a collective of several CBOs (sports, cooperatives, savings groups). They initially engaged in emergency actions (*e.g.* distribution of mosquito nets, purchase of water pumps), but soon they recognized the need for a more sustainable and participatory approach to flooding. Neighbourhood upgrading and *in situ* resettlement with a focus on storm water management were seen as a main solution.[171] They maintained that a collective reflection and a consensus about a reorganised shared urban space were necessary in the process of remedying flood-affected neighbourhoods.[172]

In 2007, community leaders initiated collaboration with a Swiss NGO working in the domain of participatory urban development and sustainable urbanism. Given their experience in urban planning, the NGO was keen to assist the CBO collective in undertaking participatory neighbourhood planning the aim of which was to prepare a base for future neighbourhood upgrading (USF 2009). Between 2008 and 2013, with intermittent support from the mayor of DTK, residents worked in close association with the NGO and local planning professionals. Applying the formal upgrading procedures detailed in official guidelines produced by the para-statal agency FDV, they developed a participatory planning process. For this purpose, the commune's neighbourhoods were split into three zones. Residents of each zone created a '*GIE de restructuration'*, which oversaw the participatory

[171] Written communication with NGO staff member, Dakar, 13 July 2016
[172] Int. with NGO staff member, Dakar, 07 February 2016

planning process. Similarly to the state-led upgrading programmes in DSM described in the first example, the citizen-led process in DTK focussed on local planning and land regularisation.[173] In DTK, however, the goal of the planning sessions was to agree the necessary urban public facilities and modifications to the urban tissue in order decrease flooding and waterlogging in the zone.[174] Possibilities for *in situ* resettlement were explored and discussions were held on the subject of two large water retention ponds which had been constructed by the state as part of the post 2005 *Jaxaay* emergency plan. Residents were resentful of the ponds because their everyday lived experience led them to associate these amenities with forced evictions, drowning of children and proliferation of mosquitos.[175]

[173] Planning was of priority while land regularization was tackled later within a program focussed on the production of land tenure certificates in association with the GIEs and the City. Being a non-state project, the certificates do not substitute legal titles. They identify a parcel and its owner in an area ahead of a regularization procedure. Based on experiences in Senegal, identification of owners appears to be the most complex.

[174] Consultation of NGO internal documents, Dakar 25 June 2016

[175] Written communication with NGO staff member, Dakar 13 July 2016

PICTURE 28: ROOFTOP VIEW OF A STATE-BUILT WATER RETENTION POND IN DTK
SOURCE: AUTHOR JULY 2012

Outputs of this consultation process comprised planning documents which were intended to serve the community, state and non-state actors as a basis for future interventions in urban development. They included a *Plan d'Urbanisme de Détail* of the commune and a *Plan d'Investissement Prioritaire.* In addition, an urban planning office was set up within the local government, indicating the mayor's support for the process.[176] A young neighbourhood volunteer, trained through the project, was recruited by the local authority to build and maintain a technical database related to the planning project.

[176] Consultation of NGO internal documents, Dakar 25 June 2016

6.3.2. CBO strategic engagement with a state-led DRM project

PROGEP – a stubborn focus on rainwater

NGO staff have suggested that citizen mobilisation and the participatory planning process in DTK between 2010 and 2012 contributed to the incorporation of the commune as one of four priority areas designated for the implementation of a major state-led drainage infrastructure programme, the *Projet de Gestion des Eaux Pluviales et d'Adaptation au Changement Climatique 2013 - 2017* (PROGEP). It also fought to advance the rehabilitation of Thiaroye boreholes which was an essential component of the project.[177] PROGEP remains the main mechanism for the delivery of primary drainage infrastructure in Dakar's suburbs.[178]

PROGEP's preparatory phase started after a major post-disaster needs assessment report was commissioned by the government of Senegal following the second devastating floods of 2009. Its key components included the production of spatial planning documents for the municipalities of Pikine and Guédiawaye, a new Drainage Master Plan (2012) and works for its gradual implementation by means of primary drainage infrastructure. Some 550 000 individuals are said to have benefitted from the programme's 150km of underground drainage canals and water retention ponds which have been designed to evacuate water into the sea (ADM 2013). PROGEP is implemented by the para-statal agency the *Agence de Développement Municipal (ADM*) and over 55% of its budget comes from international assistance, primarily in the form of loans.

The community planning process in DTK created an opportunity for local actors to link their thoughts to the preparatory phases of PROGEP. Through work with planning and technical professionals, residents gained access to the then draft version of the new Drainage Masterplan and they integrated the official propositions in their neighbourhood upgrading plans.[179] Of particular importance

[177] Int. with NGO staff member, Dakar 04 September 2014
[178] The national water agency ONAS, traditionally responsible for water and sanitation infrastructure implements projects exclusively in the municipality of Dakar.
[179] Int. with NGO staff member, Dakar, 07 February 2016

was the prospect of one or two more new water retention and infiltration basins proposed for the third zone of DTK.

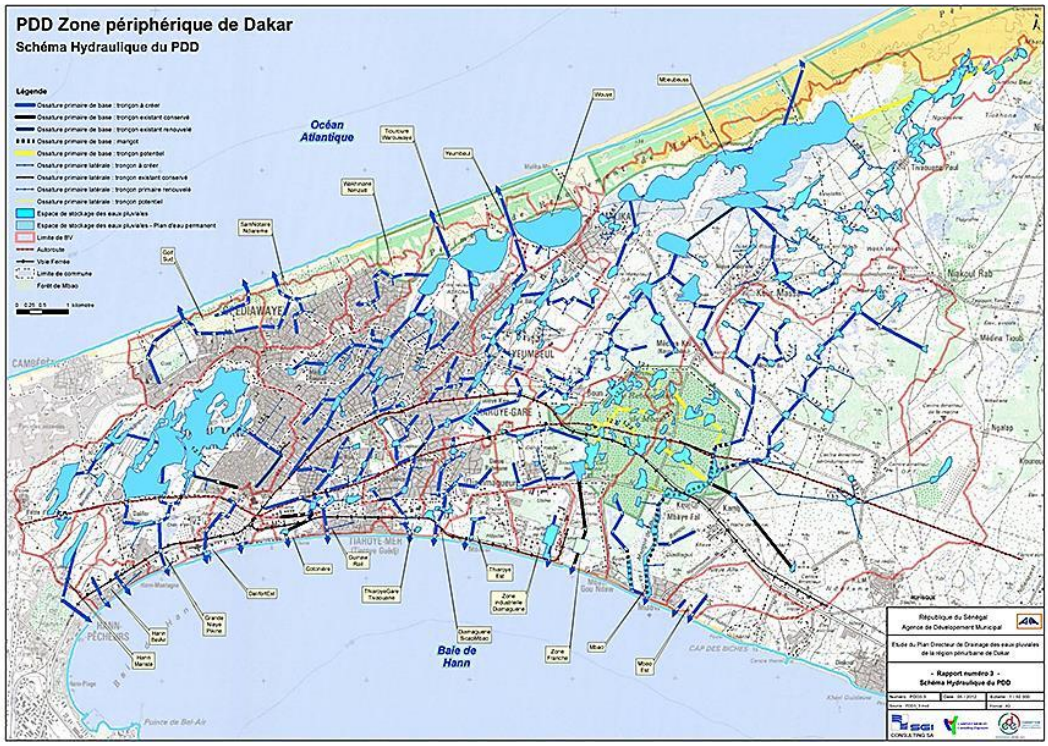

FIGURE 7: DRAINAGE PLAN FOR PIKINE AND GUEDIAWAYE
SOURCE: ADM. ACCESSED ON 25.3.2015

The participatory planning process in the commune of DTK bode well with the philosophy promoted by PROGEP's implementing agency ADM. By 2012, ADM organised a series of community consultations, exploring the needs, characteristics and ways of formalising grassroots organisations (ADM 2011). Pikine's overall drainage network as conceived by ADM, relied on the premise that state-built primary infrastructure be complemented by locally produced and maintained secondary and tertiary infrastructure. The principal condition was thus a mobilisation of sustained support and active involvement of local government authorities and community organisations.[180] In DTK, through community mobilisation and the participatory planning process, the three preconditions were

[180] Int. with senior project technical manager at *Agence de Developpement Municipal* (ADM), Dakar 11 June 2012

present. By including the commune among the four priority implementation zones, PROGEP increased its chances for a successful implementation, counting on better integration of new infrastructure with future interventions by local residents. Indeed, when the implementation of PROGEP started in DTK, a large Senegalese NGO was contracted by ADM to coordinate across agencies, local government authorities and community organisations.[181] The contractor created new local committees independent of the *GIE* set up by the project. However, some of the original members of the '*GIE de restructuration*' joined the new committees and continued being formally involved.

In contrast, the two documents produced earlier through the participatory planning sessions, the *Plan d'Urbanisme de Détail* of the commune DTK and the *Plan d'Investissement Prioritaire*, had limited impact. The documents were never officialised by the ministry, *Ministere de l'Urbanisme and de l'Habitat* but they were shared with ADM.[182] In 2013, ADM commissioned the elaboration of the *Plan d'Urbanisme de Détail* for the municipalities of Pikine and Guédiawaye (ADM 2012), but recommendations elaborated from the community-led participatory planning sessions were not incorporated in the new official planning document. This experience reproduces situations described by other civil society actors working in Dakar in the field of participatory development; it confirms that even in contexts where informal institutional ties favour collaboration between citizen-led initiatives and the state bodies, outputs of many citizen-led consultations often stand a weak chance of being formally acknowledged through formal policy.

Advocating for systemic approaches

The second outcome of the civic initiative in DTK was a targeted advocacy campaign. Campaigners reviewed existing technical studies and produced

[181] UrbaSEN, the Senegalese counterpart of the Suisse NGO UrbaMONDE filed a bid to become one of PROGEP's contractors, but the contract was awarded to a large Senegalese NGO, Enda ECOPOP. This NGO has long specialised in the domain of decentralisation and it has also been awarded a similar contract by APIX, in the context of resettlement and upgrading works related to the government's other mega project, the construction of the toll highway (described in example 3). In 2014, the NGO has a team of 31 persons to support the works of ADM and APIX.
[182] Int. with NGO staff member, Dakar 07 February 2016

additional background diagnostic and technical documentation and argued that the closure of Pikine's groundwater wells upset the urban hydraulic system, resulting in high levels of groundwater and consequent long-term waterlogging of the low lying residential neighbourhoods. The collective of CBOs, the NGO and the technical staff supporting the initiative were at the core of the campaign.

The campaigners argued that it was not the rainfall of 2005 but the lack of sewage and drainage infrastructure, compounded by the closure of urban wells and growing volumes of imported water, which led to the unprecedented rise of Pikine's water table and resulted in permanent groundwater flooding of its countless low-lying neighbourhoods. They contended that groundwater flooding in Pikine was to a large extent the outcome of a large state-led, World Bank funded, project entitled Long-term Water Sector Project which took place between 2001 and 2007. Pikine's urbanisation in the 1970/1980s and its densification in the 1990s/2000s proceeded without a necessary development of sanitary infrastructure, which led to deterioration of groundwater quality plummeting below acceptable standards for safe drinking water. Solutions adopted through the Long-term Water Sector Project included a ban on the use of groundwater, closure of urban wells and finally the commissioning of a new water supply system, designed to channel water from a distant source, Lake *Guiers,*.

Producing multiple in-house assessment reports and independent studies, the campaigners maintained that state authorities and the Bank had long been warned about the inevitability of long-term flooding should the above solution be adopted by the project. They demanded a prompt reopening of major urban wells, arguing that important synergies could be found with other state-led programmes, which sought to cater for the water needs of urban agriculture (USF 2009; Gaye 2011). Furthermore, a technical study elaborated in support of the campaign showed that unless the urban wells reopened and decreased groundwater levels, large water retention ponds built by the state would be utterly ineffective. Such claims cast doubt on the government's DRM policy and its two major projects which were being implemented in response to the 2005 and

2009 floods: the emergency programme *Plan Jaxaay* and the drainage programme PROGEP (USF 2010).

The organisations formed an alliance with like-minded professionals in organisations focussing on international development, urban planning and engineering and together they elaborated actions targeting institutions at different levels of the urban governance network: they worked in collaboration with DTK's mayor addressing relevant state ministries (USF 2009); they organised a workshop to share experiences and knowledge of participatory upgrading and argued their case at the regional level (USF 2011). Finally, in an open letter to the World Bank—who had been the single largest funder of Dakar's large urban development programmes—they demanded a formal statement about the link between state-led programmes and increased flood risk (USF 2012).

In 2014, the original team of NGO staff and technicians who piloted the participatory planning sessions in 2012, assisted women's CBOs in DTK in forming a federation of inhabitants (FSH). They also created a support NGO aiming to extend the network of women's CBOs within DTK and extending to other urban communes. The FSH became an affiliate of the international network Slum Dwellers International (SDI)[183] and started employing a shared methodology in order to facilitate incremental reconstruction of water-affected houses, particularly individual sanitation facilities. By mid-2016, over 100 households in

[183] The official web site of SDI states that "SDI is a network of community-based organisations of the urban poor in 32 countries and hundreds of cities and towns across Africa, Asia and Latin America. In each country where SDI has a presence, affiliate organisations come together at the community, city and national level to form federations of the urban poor. These federations share specific methodologies.[…] SDI is committed to supporting a process that is driven from below. The Secretariat facilitates, and sometimes resources, horizontal exchange and information sharing programmes amongst member Federations. It also seeds precedent-setting projects. These exchange programmes and projects have a "political" dimension, to the extent that they are geared towards catalysing change processes at all levels, from informal community-based institutions to formal institutions of the state and the market. Since 1996, this network has helped to create a global voice of the urban poor, engaging international agencies and operating on the international stage in order to support and advance local struggles. Nevertheless, the principal theatre of practice for SDI's constituent organisations is the local level: the informal settlements where the urban poor of the developing world struggle to build more inclusive cities, economies, and politics." [http://knowyourcity.info/who-is-sdi/about-us/ Accessed on 1.2.2016]

DTK engaged in house renovation.[184] The NGO envisaged that, over time, local networks of women's CBOs could be able to finance and implement neighbourhood-level projects in the public domain, thus reconnecting with the earlier process of participatory neighbourhood development planning.

This second example detailed a process in which restructuration emerged as a collective need in order to mitigate against flooding and prevent what had been experienced as inadequate state-led relocation. Residents of the commune of DTK engaged in participatory planning, first resisting the state and later engaging with its official DRM policy. Early initiatives in neighbourhood upgrading were hailed as an opportunity for engagement in democratic and participatory development processes. Alliances created through the process were successful in electing the commune as one of priority zones for the implementation of a major state-led flood risk reduction infrastructure project, the PROGEP. Nevertheless, the participatory planning process was not successful in upholding innovative propositions for neighbourhood redevelopment and the momentum was intermittently lost in favour of more pragmatic technical solutions promoted by state agencies.

6.4. Clashing with the other's '*grand projets*' in GRN

The third example examines the impact of a large state-led transport infrastructure project on existing community-based risk reducing interventions. In the commune of Guinaw Rail Nord, the project of Dakar's new toll highway Dakar-Diamniadio stands out as inseparable from neighbourhood upgrading and community risk reduction. GRN remains one of the most densely inhabited, informal and largely underserviced communes of Pikine. Its population in 2013 was 30 058 inhabitants (ANSD 2015b) with a density between 430 and 600 inhabitants/ha which is one of the highest in Pikine (AFDB 2008; APIX 2008). At the time of data collection in 2014, GRN had 12 *quartiers* of which 11 sufferd from

[184] Consultation of NGO internal documents, Dakar 25 June 2016

periodic or permanent flooding.[185] A study published in 2008 indicated that 75% of residents in GRN were concerned by flooding and among these some 25% faced flooding and waterlogging for six months per year while 10% experienced permanent year-long waterlogging (APIX 2008). During the floods of 2009, 83% of the commune's population were severely affected (GoS 2010).

6.4.1. A race to lead flood risk reduction in GRN

Residents of GRN, believe that prior to the memorable flood of 2005, their commune was better sheltered from floods.[186,187] This situation changed dramatically in 2005 when a large number of households quit their homes in a state of emergency. They sought safety in Camp Thiaroye, a tent city which was set up by civil protection services within an adjacent military camp. Although quickly ill-famed for its catastrophic conditions and high levels of social problems, the camp provided shelter for hundreds of families of a period of two years.[188]

According to the residents of GRN, the origins of collective civic engagement in the area need to be traced to a distinct action by a religious group, the Muslim Brotherhood for the Unity of God, led by a religious leader Serigne Modou Kara Mbacké.[189] Immediately after the late August rains of 2005, the cleric sent a group of his disciples to ease the emeregency by digging a networks of temporary open drains. Ten years later, this act is remembered vividly and it remains highly appreciated by local residents.[190] Some residents believe that the impulse given by the groups of religious youth was so important that without it, there would

[185] Inf. int. with president and secretary general of *Comité Local de Gestion des Inondations*, GRN 09 September 2014
[186] Inf. int. and neighbourhood visit with resident/community volunteer, GRN 30 June 2014
[187] FGD with resident women and girls, GRN 11 July 2014
[188] *Ibid*.
[189] Inf. int. with president of the Comité de Coordination pour le Développement de GRN, GRN 12 October 2014
[190] FGD with resident women and girls, GRN 11 July 2014.
The act of sending help through his followers was both a humanitarian and a political act aiming to question the efficacy of the state. In 2004 Kara established a political party. He was an open critic of former president Wade and more recently he has started mounting a campaign to question the authority of current president Sall.

have been no motivation for local youths to mobilise and engage collectively in flood risk management.[191,192]

This impulse was also picked up by members of the Network of Women's Organisations of GRN. It was created earlier in 2000, under the auspices of a UNDP-led Poverty Reduction programme and still is highly active in 2014. The women's network is a sister organisation of a volunteer-based local Committee for the Development of GRN, which coordinates actions by local CBOs and NGOs working in the commune.[193] Since its inception, the Women's Network has consisted of women's CBOs, all of which focus on income generation. Given its immediate access to finance, the network became a prominent actor in flood response. Women's priority was to manage a rotating savings fund, allowing many of its members to purchase sand for in-filling of low-lying streets and houses (Gueye 2009). They also routinely cooperated with the local government who owned trucks but did not have the means to purchase sand.[194]

After the floods of 2005, a voluntary Flood Management Committee was established under the auspices of the local government of GRN Nord.[195] Supported by multiple NGO initiatives, the Flood Committee was to work closely with the Women's Networks and the local Committee for the Development of GRN (Schaer et al. 2015; Schaer 2015). Between 2009 and 2014, the Development and Flood Committees along with a number of NGOs coordinated works on temporary canals which came to constitute a backbone of the area's drainage infrastructure.[196] The degree of coordination and cooperation between the organisations fluctuated in line with the political orientation and alignment of their leading members, but a temporary drainage network crystallised over time and its quality improved through incremental technical improvements introduced

[191] Inf. int. with the president of the Women's Network of GRN, GRN 13 October 2014
[192] Inf. int. and neighbourhood visit with two resident/community volunteer, GRN 30 June 2014
[193] Fr. *Comité de Coordination pour le Développement de GRN (CC/GRN).*
[194] Inf. int. with the president of the Women's Network of GRN, GRN 13 October 2014
[195] Fr. *Comité Local de Gestion des Inondations* de Guinaw Rail Nord
[196] Inf. int. with president and secretary general of *Comité Local de Gestion des Inondations*, GRN 09 September 2014

by partnering NGOs (Álvarez de Andrés et al. 2015; Álvarez de Andrés et al. 2011). In 2012, the Flood Committee received a financial donation from the mayor to enlarge the drains by means of a small hydraulic excavator.[197] It was this very improved network of temporary open drainage canals which became the basis for three permanent underground canals constructed two years later by the Flood Committee.[198] The construction works were funded by a short lived ministry mandated for upgrading and redevelopment of flood-affected zones (MRAZI)[199] and a private engineering company was contracted by the Flood Committee to execute the works. Plans for this new drainage network were aligned with the new Drainage Masterplan (*Plan d'Assainissement*) and onto sanitation infrastructure plans produced by the National Sanitation Agency (ONAS). By 2014, two of the three proposed underground canals were built, replacing the collective practice of digging temporary open drains.[200] Although a critical improvement to the commune, the underground drainage project remained a controversial and uncertain intervention. The analysis below shows that this local drainage initiative clashed with a state-led transport infrastructure project. Instead of developing synergies, the two initiatives resulted in blockages and social malaise.

6.4.2. Bearing the impacts of regional transport infrastructure

Dakar's new toll highway

Dakar's new toll highway was designed to cross five of Pikine's densely populated communes. As a Public-Private Partnership project, it was managed by APIX, the National Agency for the Promotion of and Investment in Large Projects and funded by international financial partners.[201,202]

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[197] Inf. int. with secretary general of local government flood management committee/secretary general of the coordination committee for the development of GRN, GRN 12 October 2014
[198] Site visit with secretary general of local government flood management committee/secretary general of the coordination committee for the development of GRN, GRN 15 October 2014
[199] MRAZI – Ministère de la Restructuration et de l'Aménagement des Zones d'Inondation
[200] Int. with project manager/engineer at SINCO SA., Dakar 11 November 2014
[201] Agence Nationale Chargée de la Promotion et de l'Investissement des Grands Travaux (APIX, S.A.)
[202] The principal financial partners include the World Bank, the African Development Bank and the French Development Agency (APIX n.d. n.d.). The management and operations of the highway was

Plans for this major transport artery connecting Dakar to the mainland have existed since the 1970s (APIX 2011).[203] The 32km of a new toll highway are a symbol of Dakar's expansion into the hinterland regions. The highway project started in the year following the 2005 floods and its official conclusion was planned for 2016. It was hailed as an indispensable solution to Dakar's mobility challenges and simultaneously promoted as a way to improve the lives of the hundreds of thousands of households living in flood-affected Pikine.

The first environmental and social assessment report published by APIX before the start of the highway project stated that a total of 320 000 individual residents (11 105 land parcels) would be impacted by the road project (APIX 2006). It was anticipated that neighbourhood upgrading works will be undertaken across an area of 165ha, housing 250 000 residents. A second official study published in 2008 indicated that around 242 000 inhabitants lived in the five communes affected by the highway's construction and upgrading works (APIX 2008).

The project promised important improvements to Pikine's primary and secondary road network, end to flooding and construction of multiple community facilities (APIX n.d.). It consisted of three principal components: the new highway, a resettlement facility for project affected households and upgrading of those Pikine's flood-affected neighbourhoods directly affected by the highway. However, critics have argued that the highway has led to exclusion of a sizeable part of Pikine's population from any of the planned benefits, severe spatial disconnection of many neighbourhoods in the road's vicinity and a worsening of flood risk and waterlogging in many adjacent neighbourhoods.

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awarded to the French Group Eiffage and its subsidiary, the *Société de la Nouvelle Autoroute Concédée* (SENAC SA).

[203] Int. with urban planner, APIX restructuration urbaine Pikine Irregulier Sud, Dakar 15 March 2016

FIGURE 8: DRAINAGE INFRASTRUCTURE PROPOSED IN THE CONTEXT OF THE NEW TOLL HIGHWAY
SOURCE: APIX 2011

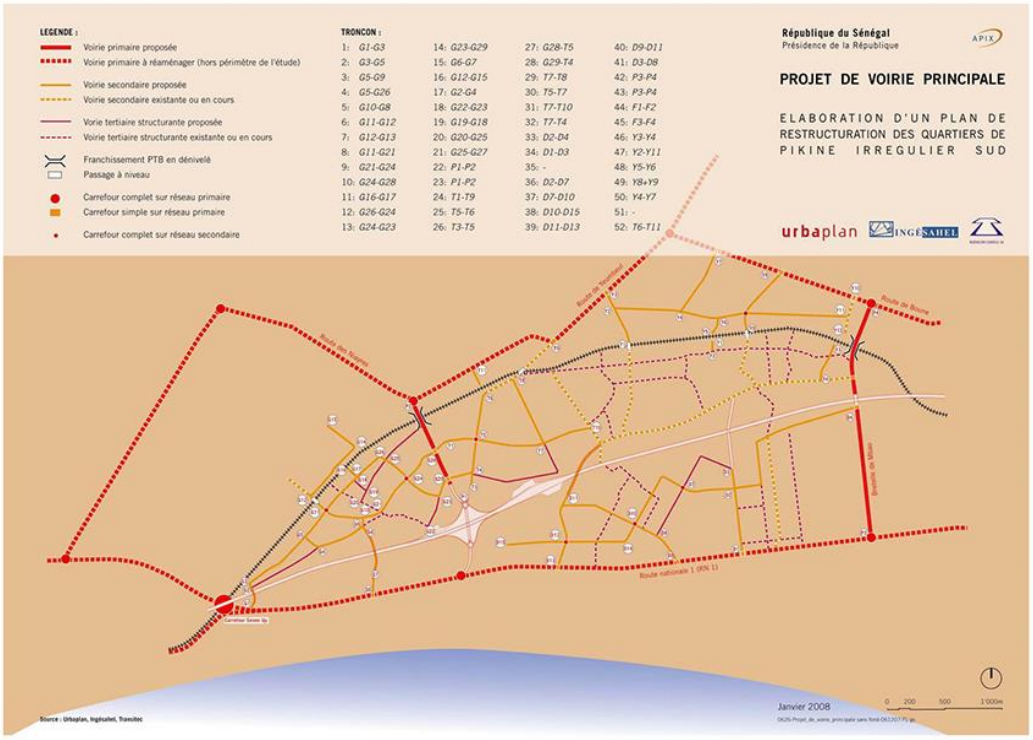

FIGURE 9: NEW ROAD INFRASTRUCTURE PROPOSED IN ZONES IN THE VICINITY OF THE NEW HIGHWAY
SOURCE: APIX 2011

A highway's approach to neighbourhood participatory upgrading

Early conceptualisation of the highway project included an ambition to build upon and continue the work by the agency FDV, using the formal neighbourhood upgrading model (Keita 2012). A technical study for neighbourhood upgrading originally elaborated in 1998 for the German development agency was updated to serve as an operational basis.[204]

In 2008, APIX published a study outlining its conditions for the resettlement of project-affected households which included details about neighbourhood upgrading and land regularisation of informal neighbourhoods affected by the highway (APIX 2008). The first phase of preparation works involved organising inhabitants into a *GIE de restructuration*. The aim was to create an interlocutor between local residents and the para-statal implementing agencies. A 2014 report by APIX stated that some 683 houses and 493 commercial units were to be impacted by upgrading works and needed relocating (APIX, 2014). However, by the time upgrading works started in 2015, the importance of the upgrading component seemed to have lost its appeal. In 2014, major works on the highway were concluded, but movement towards neighbourhood upgrading interventions in most of the communes did not start before early/mid 2015. Upgrading interventions fell into three categories (APIX, 2014: 4):

- flood risk-reducing infrastructure including 40 water retention ponds, a drainage network, connection of the network to major drainage along the highway and upgrading of pumping stations. It was estimated that these additional works would impact 261 premises of which 71 were inhabited (equivalent of 156 households);
- upgrading of the primary and secondary transport network in adjacent neighbourhoods. Affecting some 321 premises (equivalent of 834 households), most of them occupied;

[204] Programme de restructuration des quartiers spontanés de Pikine (PRQS-PIS)

- development of socio-economic services consisting primarily of the redevelopment of a local market into a shopping centre; construction of two sports centres, six schools, and two multifunctional centres for youth and women's community activities. It was estimated that these works will impact 99 premises of which 77 were occupied (equivalent of 265 households). Most of the impacted premises were in the commune of GRN.

In GRN, upgrading plans envisaged the redevelopment of a commercial zone and its integration in Pikine's wider urban tissue. This involved tracing a transport axis across the commune, linking three major zones of socio-commercial activity.[205] The approach adopted by APIX had been initially welcomed positively by planning professionals because it appeared significantly more urbanistic than previous neighbourhood upgrading interventions in Pikine.[206] Nevertheless, when the neighbourhood upgrading works were due to commence in GRN in mid-2014, APIX and its implementing partner organisations found a web of local actors highly suspicious of the project (APIX 2014b).[207] The following section analyses the factors which contributed to missed opportunities for new synergies.

6.4.3. Missed opportunities for synergies

Impacts of the highway project on water-affected neighbourhoods in Pikine have been profound: the newly built highway led to an aggravation of flooding in many adjacent neighbourhoods. Furthermore, when residents claimed access to benefits allegedly provided by the highway project, their CBOs and local government representatives found the project's implementing agency APIX a difficult interlocutor. Finally, a highly politicised and speculative environment emerged as a by-product of the resettlement process and due to APIX's lengthy manoeuvres prior to embarking on the neighbourhood upgrading component of

[205] Int. with urban planner, APIX restructuration urbaine Pikine Irregulier Sud, Dakar 15 March 2016
[206] Int. with urban planner and dev. specialist at the *Institut Africain de Gestion Urbaine*, Dakar 23 December 2014
[207] Int. with senior NGO staff member, resp. for com. support on behalf of APIX and ADM, Dakar 17 October 2014

the project. A pervasive economic logic, which came to permeate all relation, led to a stalling of collaboration among local DRR actors.

Exclusion from acclaimed public benefits

Since the opening of the first segments of the new highway in 2011, major technical flaws became apparent to residents living in the vicinity of the new highway. A large majority of Pikine's watersheds drain southwards; north of the highway, disruption and blockage of water flows led to deterioration of the environment in water-affected neighbourhoods [208] Waterlogging equally developed in areas which had not suffered previously. This eventuality was known to APIX and its funding partners from the start of the highway project: the summary report of the environmental and social impact assessment study published in 2008 stated that, "during the operation phase, the cumulative effects of the construction and use of the road will take the form of sound nuisance and atmospheric pollution (gas), accidents, physical separations and risk of flood, etc. More specifically: […] physical barrier provided by the highway wall, risk of flooding of districts located on the right bank, physical interruption and disruption of the traffic, insecurity and risk of aggression" (AFDB, 2008: 8).

Whereas residents appreciated the shortening of time needed to commute to central Dakar, they expressed frustration over the spatial disconnections introduced in what were originally densely networked neighbourhoods.[209] Due to a sparse frequency of pedestrian overpasses and bridges, time required to cross the highway doubled. Personal safety and security on and around the main bridges and overpasses became a major concern.[210] The new conditions forced many residents to depend on networks of informal taxi providers, significantly increasing individual and household expenses required for day-to-day mobility.

A provision was made for the highway's own drainage canal, but whereas the highway had been promoted as a long awaited relief to flooding, the state banned

[208] Inf. int. with NGO staff members working on community flood management, DSM 16 February 2016
[209] Neighbourhood transect walk with youth CBO members, DSM 02 January 2015
[210] *Ibid*.

residents of adjacent neighbourhoods from making secondary connections to the highway's drainage canal.[211] The toll road and its canal were securitised by a high wall, keeping it firmly dissociated from the urban texture it cut through. In 2014, along the highway's 12km long segment across Pikine, countless small holes in the wall testified of the residents' sustained endeavour to overcome the barrier and to gain some benefit from the facility. However, instead of accommodating the different parties' needs and interest, violent confrontations with police have become more frequent.

Equally characteristic of unequal institutional power relations was the relationship between the project implementation agency APIX and some of the formal local organisations, including the Flood Committee of GRN operating under the auspices of Pikine's local governments. In 2013 and 2014, the president of the Flood Committee of GRN addressed APIX formally, requesting a permission to connect a number of neighbourhoods to the highway's drainage network in order to alleviate acute flooding in houses adjacent to the highway. His request remained unanswered.[212] Instead, through unofficial declarations, APIX's staff responded that Pikine's flood water was essentially leaked sewage and the highway's drainage facility was not designed for such a purpose. Two subsequent GRN mayors refused to mediate over this disagreement between the Flood Committee and APIX. By the time the underground canals in GRN were being constructed in 2014, the Flood Management Committee could no longer be certain that earlier arrangements with APIX would be honoured and that the new canals would be connected to the highways drainage network.[213]

[211] Inf. int. and neighbourhood visit with com.flood response volunteer/com. health worker, DSM 12 June 2014
[212] Inf. int. with president and sec. general of *Comité Local de Gestion des Inondations*, GRN 09 September 2014
[213] Int. with urban planner, APIX restructuration urbaine Pikine Irregulier Sud, Dakar 15 March 2016

Resistance to expropriation and boycott

Of the proposed three secondary underground canals within GRN's water-affected neighbourhoods, only two were built by the end of 2014. Works on the third canal were halted due to unresolved conflicts between house owners and the Flood Committee. Based on technical specifications for this middle-size underground drainage project, a dozen houses were designated for demolition in order to clear the way for the third canal.[214] Nine heads of households were offered cash compensation by MRAZI for the loss of their houses, but they refused to accept the offer. Residents, supported by youth associations, formed a movement and blocked the construction of a third canal.[215] The youth demanded that compensation paid to their fathers—customary owners of land parcels—be equivalent to the resettlement packages offered by APIX to their former neighbours who had been compensated in the context of the toll highway project.[216]

Works on the three canals were funded by the Ministry of upgrading and redevelopment of flooded zones (MRAZI) though the *Programme Décénal de Lute Contre les Inondations.*[217] During its short existence between 2012 and 2014, MRAZI focused on construction of infrastructure for flood mitigation and resettlement of eligible households. Neighbourhood upgrading was not a priority and it was not reflected in the logic of MRAZI's interventions. Neither did the Ministry engage in a dialogue about urbanism and the future of the neighbourhoods.[218]

[214] Int. with project manager/engineer at SINCO SA. 11 November 2014
[215] Site visit with secretary general of local government flood management committee/secretary general of the coordination committee for the development of GRN, GRN 15 October 2014
[216] Inf. int. with local resident/CBO member, GRN 19 December 2014
[217] Ministère de la Restructuration et de l'Aménagement des Zones d'Inondation (MRAZI)
[218] Int. with urban planner and dev. specialist at the Institut Africain de Gestion Urbaine, Dakar 23 December 2014

PICTURE 29: A PEDESTRIAN PATH OVER AN UNDERGROUND CANAL IN GRN
LINED BY NEWLY REBUILT HOUSES IN GRN. SOURCE: AUTHOR, SEPTEMBER 2014

PICTURE 30: OPEN TEMPORARY DRAINS USED BY HOUSEHOLDS TO CHANNEL WATER IN GRN
FROM UNSERVICED STREETS TOWARDS THE UNDERGROUND CANAL.
SOURCE: AUTHOR, SEPTEMBER 2014

Because the highway toll project classified as a public utility project and its funding came from international financial institutions, APIX had disposed of a sizeable budget which made it possible to buy out resistance in order to avoid delays in the execution of the works. Unprecedented cash compensations made it practically impossible for smaller ministries such as MRAZI, local authorities or other public bodies to match such conditions in more restricted projects- including that of the third underground canal[219]

Months after the conclusion of works on two of the three underground canals, residents who had blocked the construction of the third canal had an additional reason not to accept the compensation sum made available by MRAZI. Even before seasonal rains could have testified to the effectiveness of the two new underground drains, owners of houses along the newly serviced streets embarked on intensive investment and restoration of their houses.[220] Residents of GRN Nord thus became daily witnesses of an unprecedented 5 to 10-fold increase in the price of land in the zone.[221] Land prices were equally hiked up by the prospect of neighbourhood upgrading envisaged by APIX in both Guinaw Rail North (GRN) and Sud (GRS). As part of its neighbourhood upgrading scheme, APIX had envisaged to substitute a large local market, the Waranka market, with a new commercial complex. In early 2014, the opposition movement was joined by local business associations who protested against a new redevelopment scheme proposed by APIX (Thiam 2014).[222] An opposition campaign succeeded in altering APIX's plans: the old market in the commune of Guinaw Rail Sud (GRS) was preserved and a construction of a new market started across the street on a site formally in GRN. This solution ensured future tax revenues from the two markets for the mayors of both of the communes. The lauded urbanistic component of the highway project —neighbourhood upgrading in select water-affected sites adjacent to the road —

[219] Particip. obs. at a project proposal writing workshop with two local NGOs working on participatory planning and urban youth governance, Dakar, 22 February 2016
[220] Site visit with secretary general of local government flood management committee/secretary general of the coordination committee for the development of GRN, GRN 15 October 2014
[221] Int. with project manager/engineer at SINCO SA. 11 November 2014
[222] Inf. int. with local resident/CBO member, GRN 19 December 2014

was delayed until early 2016.[223] Delayed by repeated instances of resident opposition, was thus also a project of a new transport axis linking zones of socio-commercial activity across GRN. As discussed by Mansion and Rachmuhl (2012) in a study of four upgrading and redevelopment programmes, which included that of the toll highway in Dakar, urban state-led interventions are too often guided by political and economic interests formulated by national elites and international investors whereas local needs and interests come second.

6.5. *Restructuration* – a tool to mediate state-society relations

The chapter above examined three examples of intersections between neighbourhood upgrading and community interventions aimed at reducing flood risk. Among Pikine's residents, neighbourhood upgrading is the most commonly declared solution to address flood risk in Pikine. The first example of neighbourhood upgrading in the commune of DSM focused on a large state-led neighbourhood upgrading programme which was designed following the formal upgrading model. Although progressive in its conception, the programme's outcomes were jeopardised by flooding. The second example in DTK showed how a community-led participatory planning for neighbourhood upgrading initiative—which was conceived in opposition to state-led resettlement—made it possible for select neighbourhoods to benefit from an associated state-led drainage project. The last example in GRN focused on a disequilibrium produced by a major state-led transport and redevelopment project. Unequal conditions introduced by a toll highway project led to inflated markets, speculation, skewed expectations and weakened the capacity of community CBOs and the local government to coordinate local upgrading and risk reduction initiatives.

Examples across the three communes indicate that a great variety exists in both what constitutes urban upgrading and redevelopment projects and how these interventions link to community action and DRR specifically. Across the three examples, neighbourhood upgrading interventions create remarkably diverse

[223] Inf. int. with NGO staff members working on community flood management, DSM 16 February 2016

opportunities as well as constraints for community-based disaster risk reduction. Although a formal participatory upgrading procedure, which included the creation of the *GIE de restructuration* and land regularisation, was followed across all of the initiatives, its outcomes widely varied. The principal difference in the application of the model was its purpose. In the first example, the official model served as an operational basis for a formal urban policy which was to be implemented through systematic projects. Upgrading was a goal in itself. The second example showed how the formal model was used by local actors who employed it to legitimise their vision of recovery and to negotiate greater inclusion in state programmes. The third example showed that the promise of upgrading was used to relieve potentially conflictual and politically sensitive situations.

Neighbourhood upgrading leads to a modified physical environment, one which can either reduce or increase flood risk. Along with infrastructure and redevelopment projects, neighbourhood upgrading can paradoxically amplify fragmentation in the city: in Pikine, it led to increased land prices, spatial disconnections, new divisions between serviced and un-serviced areas as well as speculation about resettlement within newly urbanised peripheries. This fragmentation came on top of spatial fragmentation due to in-filling, waste deposits and open sewage, which I addressed in chapter 4.

Finally, across the three communes, institutional arrangements for upgrading changed, as did power relations between the state and non-state actors. Where uncertainty prevailed about future government interventions, local initiatives were stalled. Where large state-led projects set unrealistically high expectations and modified local economic conditions, local governments had little leeway (legitimacy and resources) to pursue alternative solutions for delicate interventions. However, powerful large state agencies were no longer the sole actor to engage in neighbourhood upgrading. In 2009 the agency FDV signed a partnership with Cities Alliance, declaring that it would continue Pikine's upgrading through a programme *Des Villes Sans Bidonvilles* (Cities Without

Slums), but there are now other autonomous community groups and NGOs which too engage in neighbourhood planning and upgrading according to their own needs and standards. Pikine thus continues to be both restructured and resettled through a process which is both fragmented but also replete with opportunity.

7. NEGOTIATING LAND FOR RISK REDUCTION: THE PARK

7.1. Introduction

This last empirical chapter is built around an analysis of a distinct CBO-led DRR project. The Park project was an initiative of a youth neighbourhood association in the commune of Diamaguène Sicap Mbao (DSM). I have discussed the Park project in the previous chapters: in chapter 5, I showed how the Park was conceptualised as an instrument to modify land use and to challenge local risk-increasing practices such as waste tipping and intentional sewage leaks. In an urban neighbourhood characterised by spatial fragmentation and social tension, the youth conceived of the park as a much needed space for socialising. In chapter 6, I argued that the Park was a way for the youth association to engage with neighbourhood upgrading programmes and that this initiative showed the extent to which community interventions linked to the large process of urban change. In this chapter, I analyse in greater detail the characteristics of community actors and the dynamics of local power relations which shape community-based disaster risk reduction interventions. I focus on the actors' remits, roles, motivations and how these shape their interactions. The analysis is thus also a window into the politics of CB-DRR.

The situation which I have selected for analysis in this chapter consists of a series of negotiations, which took place during the period of my fieldwork. Mitchell's (Mitchell 1983) definition of situational analysis features three main components: a set of events – which consists of activities and behaviour worthwhile studying, a situation – which is the meaning that actors give to events, and a setting – which is the structural context and which may not be fully known to actors.

I also draw on the work of Clarke (2003:554) who emphasised the importance of studying negotiations which take place between actors, with attention to "[...] major positions taken, and not taken, in the data *vis-à-vis* particular discursive axes of variation and difference, concern, and controversy surrounding complicated issues in the situation."

Hannerz (1980) argued that behaviour differs across situations, depending on what distinct actors know about each other's personal attributes (ethnicity, sex, age) and about other actor's roles (other purposive situational involvement of a person). Based on this knowledge, behaviour towards each other will differ in r*ole access* – others may or may not let an individual assume a certain role, *relational access* – some may or may not be regarded as appropriate interlocutors (e.g. will not have access to another actor), *relational conduct* – interaction may be affected by the kind of information known about each other. In the study of social interaction and network analysis these considerations constitute the principles of power in the organisation of social life. Actors seek is to cross roles, rather than accept organisational and institutional boundaries.

The analysis which follows is divided into two parts. I use the park project as a window into the characteristics of a contemporary urban youth association. I then analyse the process of acquisition of a physical site for the park in order to understand the broader institutional relationships shaping community-based disaster risk reduction.

7.2. Asserting organisational values and identity through public space

The park was fully designed by members of the youth association and detailed in a blueprint digital model which they produced before the start of the project. It consisted of three functional areas: a leisure space with benches designated for all residents, a box-gardening (micro gardening) space for the association's women's group to grow vegetables and herbs, and a micro-football pitch for young boys.[224] The tri-partite design of the Park echoes aspects pertaining to the values and identity of the youth association. The need to create a space for everyone to socialise relates to the need for social cohesion. The micro-gardening and sport component reflects issues pertaining to gender.

[224] Particip. obs. at an NGO-led training session focussed on development of community project proposals by youth CBOs, DSM 18 September 2014

During the period of my fieldwork, by mid-2015, the leisure space (*ca.* 50m^2) was officially inaugurated and boxes for micro-gardening were temporarily installed in its vicinity. The Park consisted primarily of an elevated platform with benches. The park leisure space was immediately appreciated by local residents and it became quickly used throughout the day by men gathering after their morning prayer, by school children eating their lunches, by artists producing their music videos.[225] By the end of my fieldwork, the remaining two thirds of the project site, the micro-garden and the football pitch, remained undeveloped due to insufficient funds necessary to raise the ground above the waterlogging line.

7.2.1. The Park: a youth CBO's quest for social cohesion

At present, many community organisations in Pikine have their origins in anti-flood action (2000-2005). Over a half are formally categorised as associations for neighbourhood development (*ADQ*). They engage in a variety of activities comprising neighbourhood cleaning activities, health awareness campaigns, literacy courses and diverse solidarity initiatives. A large number of ADQs have been created by the residents of Dakar's suburbs since 2009. In the commune of DSM, one or two youth neighbourhood development associations are present in every neighbourhood. This momentum has been popularly attributed to the residents' loss of patience in the absence of government solutions to flood risk.

In Wolof, one of Senegal's official languages, the name of the youth association discussed in this chapter stands for the verb to "protect" or "save". Its origins date back to the early 2000s but the organisation was consolidated in 2005 when, like many others, it helped fight the flood which had ravaged many of Senegal's cities and regions. Members of the first generation of the association were predominantly young men. In 2011, the association was passed on to a second generation of young leaders and members.[226] In 2014, the association counted 57 young men and women—22 and 35 respectively—aged between 16 and 35

[225] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24 April 2015
[226] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014

years.[227] The leading members of the association were in their late 20s/early 30s.[228]

Members of the association uphold volunteering and equality as their principal values. Its leaders emphasise passive recruitment: new members are expected to seek out the organisation and join only when they feel strong affinity with its mission. This ethos is reinforced internally by a discourse which emphasised members' equality and internal cohesion. Dakar's suburbs house a population which is socio-economically highly heterogeneous. Compared to earlier generations of urban CBOs, present-day youth associations have a much greater proportion of highly educated members.[229] One of the critical issues faced by youth associations is a risk of internal conflict caused by differences in members' social status and educational levels. This risk is compounded by the fact that many youth associations have elected leaders who are well-educated youth.[230]

> During the training session, I was observing Group 1 from afar when one of the trainers asked a girl to interpret for me some of the discussions held in Wolof. It turned out that she was the treasurer of the local youth association for neighbourhood development. She has an undergraduate degree in finance and management. She also pointed out that the secretary general of the association, who did most of the talking for the group, had a degree in history. The president is a social worker specialised in public health and the vice-president is a teacher.[231]

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[227] Particip. obs. at an NGO-led mid-term evaluation with youth CBOs working on neighbourhood development, Pikine 24-25 April 2015

[228] Senegal's official youth development policy designates youth as those citizens aged between 15 and 35 years. National census data from 2002 indicate that youth aged 15-35 counted for 42.2% of the population of Dakar region. Those aged 25-35 accounted for 26,6% of all youth in the Dakar region (ANSD 2008).

[229] Inf. int. with NGO senior staff member, DSM 11 November 2014

[230] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 25 April 2015

[231] Particip. obs. at an NGO-led training session focussed on development of community project proposals by youth CBOs, DSM 18 September 2014

On a different occasion:

> Walking back to the school, I spoke to the treasurer of the second youth association participating in the project. This young man is a maths university student. Other members of their association have higher degrees in law, pharmacy, sociology... Later on, he explained that they have had to change the name of the association, removing from their name a reference to 'pupils', not to discourage potential members who had not been schooled [...] This applies to many girls. Young girls are now 80% of news members.[232]

Aware of latent tensions caused by socio-economic differences at the heart of youth organisations, leaders of the youth association in DSM emphasise the value of each member despite large differences in educational and social status. They are vocal about the complementarity of all members' skills and capacities.

> I asked the president of the association whether they'd want to become an NGO. He replied that an NGO could not accommodate the diversity of skills and strengths of members as varied as there are in the association. He spoke of those who are mechanics, teachers, medical technicians, educated and non-educated. Even when their levels of education differ, it is important to value each one's real or potential contribution. Yet, he mentioned that there is at present an internal conflict between members who are educated and those who are not.[233]

This discourse aims to preserve a fragile balance in a social environment where existential pressures and social hierarchies threaten cohesion within the group of like-minded youth. Nevertheless, it is not simple for the association to always respect this ethos. The following example shows that contradictions exist even within the relationship between the association and its support NGO.

> The NGO pointed out that they should include members with disabilities. Not only is it important to be inclusive, but this would

[232] Particip. obs. at NGO gender training workshop (D1) and FGD, Keur Massar 12 November 2014
[233] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014

> allow the association to become more flexible. The NGO argued that those who do not attend school would be available to take part in training sessions and represent the organisation during the time when others are unavailable. This would resolve countless negotiations between the youth and the NGO about the scheduling of meetings and training sessions. However, the youth pointed out that including persons with disabilities and those without education was practically impossible because training sessions delivered by NGOs were often in French rather than in Wolof. Illiteracy, including limited mastery of the French language, is thus equated with disability. The president of the youth association stood up and he enthusiastically shared his organisation's stance on membership: valuing the contribution of all of its members both educated and uneducated.[234]

Finally, the youth association provides an opportunity for new residents to better integrate into neighbourhood life. Members include both youth who have grown up in the neighbourhood and those whose families have moved in after being displaced by flooding from other neighbourhoods. The association also remains an anchor for youth whose families had been resettled but who regularly return to take part in the association's activities.[235]

7.2.2. The micro-garden: a gendered space

The micro-gardening component of the Park reflects the youth association's further endeavour to be inclusive and equitable. Since the passing of a parity law in 2010, one of the priorities of youth neighbourhood associations has been to increase membership of young women and girls and to integrate them in neighbourhood level initiatives.[236]

Recruitment and membership of young women and girls in youth associations is not devoid of its difficulties and paradoxes. Some members suggested that the

[234] Particip. obs. at an NGO-led mid-term evaluation with youth CBOs working on neighbourhood development, Pikine 24-25 April 2015
[235] Transcript of a FGD with local residents/members of CBO executive committee, DSM 08 February 2016
[236] Particip. obs. at NGO gender training workshop (D2) and FGD, DSM 13 November 2014

timing of community events and meetings does not fit women's schedules and it prevents them from meaningful participation.[237,238] Parents are uncomfortable about their daughters having to walk unaccompanied through dark neighbourhoods in order to participate in evening CBO meetings. During weekends, girls are often required to manage additional domestic tasks. CBO members have argued that the most crucial constraint to girls' participation is linked to social change at neighbourhood level.[239,240] Parents are weary of girls joining organisations which have been traditionally seen as male dominated. In addition, both established and new neighbourhoods have become more fragmented and neighbours have less information about each other. This applies both to neighbourhoods which had originated as resettlement zones as it does to neighbourhoods where the proportion of new tenants has increased with flooding and depopulation.

In DSM, paradoxically, the parity ideal clashes with the association's guiding philosophy of passive recruitment: while NGOs encourage youth leaders to mobilise girls and young women, youth leaders argue that the organisation's ethos of voluntary engagement prevents them from pro-actively and selectively recruiting women.[241]

Once they become members, women and girl's roles in youth neighbourhood organisations often remain gendered. Some associations in DSM have internal procedures whereby the functions of the president and vice-president are split between a man and a woman.[242] Nevertheless, the function of a treasurer is often held by girls because women are said to be better and more reliable in managing finances. Women and girls often guarantee the association's financial stability and its capacity to remain operational as they often finance youth organisation

[237] Inf. int. with CBO members during a strategic meeting of the organisation, DSM 24 September 2014
[238] Particip. obs. at NGO gender training workshop (D2) and FGD, DSM 13 November 2014
[239] Particip. obs. at NGO gender training workshop (D1) and FGD, Keur Massar 12 November 2014
[240] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 25 April 2015
[241] Particip. obs. at NGO gender training workshop (D2) and FGD, DSM 13 November 2014
[242] Particip. obs. at a youth association's annual general assembly, DSM 30 November 2014

through purchase of membership cards and regular contributions as well as act as key mobilisers for door-to-door fundraising campaigns.

> Commenting on the role of women in community associations, members enumerated the following: micro-gardening, mobilisation for blood donations, preparation of welcoming ceremonies and catering. They agreed that women are called upon to support of events which require participation of many people such as neighbourhood clean-up session, visits of the mayor, visits of presidents of other organisations, or politicians during elections and donors. […] Allegedly, members of the local sports association have recently created a women's committee: girls are responsible for the preparation of food and refreshments during football games. [243]

Men, on the contrary take roles related to action and the public sphere such as drainage, sanitation and waste. A workshop held with youth associations in DSM showed that men benefited from remunerated opportunities more than did women and girl members.[244] The micro-gardening component of the Park project was envisaged to give women and girls more autonomy. Nevertheless, it is also an example of a routine link between women and income generating activities. Income generation is a positive motivation for neighbourhood engagement and an opportunity appreciated by all CBO members, but conditions often differ for men and women. In the case of the micro-gardening project, the activity requires that women successfully grow, but also that they market their produce. Men, on the other hand, have benefitted from opportunities remunerated through a regular salary, such as those paid through a household waste pre-collect project ran by the youth association.

Some organisations have agreed internal procedures to provide equal benefits to its active members. One of these rules ensures that all members take turns in

[243] Particip. obs. at NGO gender training workshop (D2) and FGD, DSM 13 November 2014
[244] *Ibid*.

order to benefit from attendance at financially remunerated events such as training sessions organised by NGOs.[245,246]

7.3. Examining local power relations: renegotiating the Park

The Park project is a relatively small neighbourhood-level youth initiative, but the process through which the acquisition of the site was negotiated provides valuable insights into the characteristics of a large set of community actors, their motivations and the meaning they give to interventions. The period of site acquisition coincided with my principal fieldwork. During four months I was able to participate in meetings, informal discussions and negotiations held between the youth association and other key local actors, including: local government representatives, neighbourhood leaders – *délégués de quartier*, the para-statal agency FDV in charge of neighbourhood upgrading projects and the locally constituted committees – the *GIE de restructuration*.

In developing their park, the youth association was guided by its support NGO who had secured funding for the project by partnering with a development iNGO. Initially, the youth identified a first site which they deemed suitable for the project. It was a large plot of land of over 400m^2, situated in the centre of a residential neighbourhood. Located across the street from the house of a *délégué de quartier*, the site was a promising safe place for socialising. Nevertheless, ideal as it was, it became unrealistic for the association to gain access to this site. The site consisted of three distinct parcels of land of which two, both vacant and unused, were owned by private proprietors who had moved out of the area. Only the third plot was classified as public, state owned land managed by the agency FDV.

In most communes, the responsibility over the management of public land is divided between the mayor and the *prefecture* (the state's deconcentrated arm at the level of a commune). However, that is not the case in neighbourhoods which

[245] Inf. int. with CBO members during a strategic meeting of the organisation, DSM 24 September 2014
[246] Inf. int. with youth CBO member, DSM 19 November 2014

had been included in the state-led neighbourhood upgrading project and where allocation of the resulting vacant public land remains the remit of the agency FDV, mediated by the *GIE de restructuration*. The latter was the case of neighbourhoods in which the youth sought to implement the Park project. Although the youth had known about the agency FDV, they initially failed to appreciate its role in local land management.

Over a period of two months, discussions were held and ideas were exchanged between the local actors, with the exception of the two private land owners who never responded to an invitation to meet the local actors. Due to an approaching project reporting deadline set by the donor, the youth found themselves under pressure from their support NGOs and the atmosphere became tense as NGO staff sought to accelerate and finalise the negotiations. Alternative proposals were floated, debated and rejected, intermittently spreading misinformation and creating confusion. Some propositions contemplated expropriating the private owners on the basis of a desire that it be a ”public utility” project.[247] Although unrealistic, the youth's desire to treat their Park as a public utility project can be tentatively explained by the influence that large state-led urban projects have had on imagination of Pikine's residents. State-led upgrading programmes, PROGEP or the toll highway fall in the category of such influential projects given that all was made possible to facilitate their implementation.

After a period of deliberation, the agency FDV refused to continue discussions about a site which involved private property. It argued that it would be unable to expropriate land from the two private owners, because of shortage of plots within the already saturated resettlement zone in Keur Massar which it could offer in compensation.[248]

Amidst high uncertainty, the agency FDV offered a second site which consisted exclusively of public land. The site was a long strip of land, ca. 250m^2, skirting a

[247] Strategic meeting attended by CBO, NGO and *délégué de quartier*, DSM 21 November 2014
[248] Inf. int. with local resident/*délégué de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

major road built during the neighbourhood upgrading programme between 2002 and 2003. The plot had been empty since 2004 when houses had been dismantled to clear the way for the road and households had been resettled to Keur Massar. Both the road and the site suffered from permanent waterlogging and they had become tipping sites for domestic waste, sludge and leaked sewage.[249] Nevertheless, the prospect of an arrangement with the agency FDV meant that the youth association would be formally acknowledged as the site's developer and the future manager of the only park in the wider area.

The above narrative presented what may appear as a relatively straight forward progression of events. What follows is an account of the challenges involved in the delicate negotiations which took place between the concerned actors and the wider context which shaped the actors' attitudes, positions, motivations and decisions.

7.3.1. Remits, roles and motivations of local actors

During discussions about a suitable and available site for the Park project, the youth association adhered to standard procedures set by its support NGO. One such procedural requirement implied that neighbourhood level interventions be agreed and overseen by the *délégués de quartier*. The *délégués* are neighbourhood-level formal representatives of the state. Their key responsibilities include small administrative duties, resolution of local disputes and facilitation of community action. As the deconcentrated arm of the state, they are members of senior councils within the local government, of technical boards and of special committees set up within state-led projects. Given their role as mediators and facilitators, many neighbourhood leaders have substantial experience with former initiatives in local development planning and project development.

The *délégués de quartier* were well positioned to mediate between the state, represented by the agency FDV, and the youth association in the latter's quest for a site for its park project. The *délégués* held two important functions: they were

[249] Particip. obs. at a major neighbourhood cleaning action (*Set Setal*), DSM 21 December 2014

on the youth association's project advisory committee and they were long-term board members of the local *GIE de restructuration.* From the early days of neighbourhood upgrading programmes, the role of the *GIE de restructuration* was to provide information, mobilise residents and represent them in negotiations with state agencies.

The *délégués* required discipline and obedience to formal procedures, but they were also keen to support new projects which promised improvements to the living standard in their neighbourhoods.[250] It was from the *délégués de quartier* who instructed the youth leaders and staff of their support NGO about the formal procedures particular to acquisition of land in DSM: the youth were required to request a formal permission to manage the site, addressing a letter to the *GIE de restructuration*, who acted as an intermediary between the residents and the managing agency FDV.[251] For members of the youth association, addressing the *GIE de restructuration* meant having access by proxy to the agency FDV and therefore the state.

7.3.2. Emphasising a duty to maintain neighbourhood peace and safeguard traditional institutions

After it become evident that the acquisition of the first plot of land would prove too difficult due to the private ownership, the agency FDV decided to allocate a different plot of state-owned land to the youth association. However, by this time, a point of discontent was being raised by the *délégués de quartier* and other executive members of the *GIE de restructuration* who felt that their own authority and reputation had been compromised by the youth. Distancing themselves from the youth groups, the *délégués* emphasised that in the past, local youth had already been awarded their own space which should have been sufficient for them—a reference was made to a multi-functional centre which had been built by the agency FDV during the formal neighbourhood upgrading process in the early

[250] Particip. obs. at a regular meeting of project partners (CBO, NGOs, *délégués de quartier*, LG rep), DSM 16 April 2015
[251] Strategic meeting attended by CBO, NGO and *délégué de quartier*, DSM 21 November 2014

2000s. Women too, as one *délégué* argued, had spaces designated for gardening and a dedicated facility, the *'maison de la femme'*. A different member of the *GIE* pointed out that the original plans for neighbourhood upgrading in DSM—elaborated by members of the GIE with assistant from GTZ and produced through a series of public consultation sessions—had included all of the necessary public amenities. Therefore whereas a park could have been a pleasant addition to the residential environment, given the circumstances, it was neither a priority nor indispensable. Finally, neither was it guaranteed that the youth group's proposal was representative of the needs and interests of the whole of the local population. The legitimacy of the youth CBO was thus indirectly compared with that of the *GIE.*

Importantly, some of the *délégués* criticised the youth for having orchestrated a situation through which neighbourhood peace was potentially put at jeopardy. Having had contemplated an option of expropriating private owners was considered a highly delicate issue. The situation could have deteriorated and led to a damaging legal process. Due to intensive urban expansion, development pressures and real estate speculation, all dealing in land was done in an atmosphere of tension and distrust. The *GIE* and the *délégués de quartier* complained that the institutions which they represented could have been gravely compromised had they been made to appear as having had personal interest in the affair. Stakes were high for the local *GIE de restructuration* because of the legal remit of the *GIE* which binds it to the formal land regularisation process. At neighbourhood level, *GIE*s act as symbolic guarantors of private property. Risking to discredit that role which the institution has stood for over the past 25 years was deemed unacceptable.[252] The role of four *délégués de quartier* from the surrounding neighbourhoods was to act as guardians of neighbourhood peace. Implication in a legal process with private owners would have had severe repercussions for their mandate and individual reputation.

[252] Inf. int. with local resident/*délégué de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

In most neighbourhoods, the *délégués de quartier* are senior men. Whereas their attitudes towards initiatives of youth associations may be seen as reflecting intergenerational differences, it is equally important to acknowledge that their roles as *délégués*, their individual interpretation of their function as well as their character and personal ambitions shaped this actor's attitude towards community initiatives such as the Park project. At present, most *délégués* are older men and they have thus lived through different stages of urban policy. Some remained advocates of policy approaches which had prioritised slum clearance and forced evictions from, zones designated by the government as zones of high risk, the so-called *zones non-aedificandi*. They conceived of themselves as instruments of the state which they viewed as the sole legitimate actor with feasible and effective solutions.[253] Consequently, youth associations were to be scrutinised, disciplined and distrusted on the grounds that they were prone to advancing agendas specific to the individual members' interest.[254] In DSM individuals with this outlook held that projects such as the Park failed to address structural causes of risk at neighbourhood level and that they detracted attention from greater priorities which included sanitation and drainage infrastructure.[255]

Another major influence on Pikine's residents, including the *délégués de quartier* has been the experience of state-led neighbourhood upgrading programmes in the first half 2000s. Upgrading initiatives represented an orderly procedure which permitted community actors to participate on the formulation of neighbourhood improvement plans.[256] Funded externally and implemented through state agencies, the upgrading model had been designed to make it less likely that unsolicited groups used such projects to strengthen their position. It had also made it easier for the *délégués* to control the process through the *GIE,* of which they were frequently executive members.

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[253] Inf. int. and project site visit with a *délégué de quartier* and an NGO staff member, DSM 16 June 2014
[254] Neighbourhood and project site visit with NGO staff and two *délégués de quartier*, DSM 10 July 2014
[255] Particip. obs. at a regular meeting of project partners (CBO, NGOs, *délégués de quartier*, LG rep), DSM 16 April 2015
[256] Inf. int. with local resident/*délégué de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

Délégués de quartier are also entrepreneurs with a profound interest in the improvement of their neighbourhood. Where state-led programmes have been sparse, their major resource has been the pool of projects brought in by CBOs and NGOs. Some *délégués* therefore view local development as an amalgam of opportunities constituted by smaller short-term projects. Consequently, they conceive of urban development as an incremental process which requires pragmatism, flexibility and strategy. This pragmatic approach is often highly effective in a context characterised by scarcity of resources. Its downside is a risk of overemphasising one's own neighbourhood and competition at the expense of a broader vision.[257] Such projects are equally a means to reaffirm the legitimacy of a *délégué* and a means to raise one's popularity and gain political credit for the benefit of a political champion.[258]

Finally, the role of a *délégué de quartier* is pre-supposed to be a life-long function. However, neighbourhood boundaries are never as stable as they may appear through the prism of plans, maps or statistics. In principle, each household has the right to support a *délégué* of their choice and therefore to decide which neighbourhood they wish to be part of. It is thus in the interest of a *délégué* to counter fragmentation of these socio-administrative units by ensuring that no individual or group musters sufficient support to become a contender. The logic of pre-empting and preventing a secession is therefore implicit in many of the *délégués'* relationship with youth associations.[259, 260]

The above concerns about the role of the *délégués* permeated the meetings, discussions and negotiations held between the youth association, its support NGO, the *GIE de restructuration* and the *délégués* involved in the planning and implementation of the Park project.

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[257] Neighbourhood and project site visit with a *délégué de quartier* and an NGO staff member, DSM 20 June 2014
[258] Neighbourhood and project site visit with NGO staff and two *délégués de quartier*, DSM 10 July 2014
[259] Walk with youth assoc. member/com. dev. agent and meeting with 5 *délégués de quartier*, DSM 07 March 2016
[260] Project site visit with a *délégué de quartier* and an NGO staff member, DSM 16 June 2014

7.3.3. Acquiring the skill and rigour in approaching institutional partners

A second point of critique concerns the youth association's lack of thoughtfulness in approaching institutional partners. Encouraged by international donors and the local NGO, the youth sought support of a newly elected mayor of Diamaguène Sicap Mbao. The question of the mayor's involvement triggered overt discord between select board members of the *GIE de restructuration* and leaders of the youth association. According to the *GIE*, having involved the mayor, the youth revealed an ignorance of the roles and the remits of distinct local actors. The timing of this dispute played a significant role: municipal elections had taken place a few months earlier in June 2014. Whereas the *délégués* had built a relatively supportive relationship with the previous mayor, this was not the case for all with regard to the new mayor who had been a candidate of an opposition party.[261] Furthermore, the dispute took place in the midst of a heated debate over a major modification to the Decentralisation Law.[262] Act III of the law was passed in December 2013 and it represented a step in the decentralisation process in that it endowed elected local governments with greater autonomy. Local governments were free to tap into new financing channels, thereby extensively modifying existing institutional power relations *vis-à-vis* the state.

Twenty years after its legal establishment, local government in Senegal remains fragile. In DSM, *GIEs de restructuration* were created in the early 1990s whereas elected local government was institutionalised in 1996. Both the *délégués de quartier* and the members of the *GIE de restructuration* thought of themselves as more legitimate representatives of the residents and as more knowledgeable of local needs and capacities. Their feeling of superiority has been propagated through narratives about the *GIE*'s heroic achievements. One such example is an initiative from 2000/2001 when the *GIE*s demanded an audience with the then

[261] Neighbourhood and project site visit with a *délégué de quartier* and an NGO staff member, DSM 20 June 2014

[262] The two previous acts date from 1972 when decentralisation concerned four principal cities Dakar, Rufisque, Gorée et Saint-Louis and from 1996 which instigated a transfer of nine devolved competencies to newly created territorial units of *région*, *commune d'arrondissement* and *communauté rurale.*
and 1996.

newly elected President Wade. The story goes that it was the *GIE* who secured an important extension of the formal neighbourhood upgrading programme in the early 2000s.[263] Nevertheless, such stories conceal the fact that neither all *délégués de quartier* nor all *GIE* board members enjoy the residents' unconditional trust. In some cases, residents have accused the *GIEs* of financial fraud. Likewise, in most zones the GIE had not succeeded in motivating residents to muster the savings necessary for the securing their tenure through the purchase of a surface title.

Finally, positioning their criticism in the domain of municipal politics, it was insinuated that the youth had attempted to politicise the Park project, seeking to further hidden agendas by establishing a link with local politics. The criticism targeted one of the youth organisation's principal tenets: their pride in maintaining the organisation apolitical. Members of community organisations, as well as community development agents, routinely declared their independence from the sphere of municipal and national politics.

The sphere of politics is associated with patron-client relations, which clashes with the prerogative of aiding the most vulnerable and those in need. Nonetheless, there are profound links between local politics and local community development and the ways in which individuals juggle their seemingly apolitical community work and political projects are an open secret.[264] In my own experience, it was not before six months of fieldwork that some of my interlocutors spoke openly about engagement in politics; needless to say, the information concerned exclusively the activities of others.

[263] Inf. int. with local resident/*délégué de quartier*/president of a *'GIE de restructuration'*, DSM 02 December 2014

[264] Inf. interviews held on 12 June 2014, 16 June 2014, 09 July 2012, 12 September 2014, 24 September 2014, 26 September 2014, 07 March 2016.

7.3.4. Balancing vested interests and search for genuine partnership

For members of the youth association, whereas they denied any interest in politicising neighbourhood development, they had valid reasons for maintaining cooperative relations with the new mayor. Contrarily to the *délégués de quartier,* members of the youth association had a conflictual relationship with the former mayor whereas their rapport with the new local government representatives elected during the 2014 municipal elections was significantly more supportive.

For the mayor, the Park project represented an opportunity to make a positive gesture towards the constituency. He promised to send 40 trucks of much needed sand to help in-fill and raise the project site above long-term water levels.[265] The prospect of recovering the site next to the road—and potentially the road itself—promised an opportunity to revive an important transport axis which had been dysfunctional since 2005.[266] Moreover, adjacent to the project plot was a site formerly designated for a public transport depot. Development of such a transport facility falls under the competencies of local government and so does its management and collection of ensuing taxes from private mass transport operators. By supporting the youth in redeveloping the site, the mayor intended to recover the road and render the depot operational, thus strengthening the revenue base of his commune.[267]

Just as the youth disapproved of having a transport depot within their residential neighbourhood, they feared that a large volume of *remblai* sand brought in by the mayor could dislocate flooding to surrounding neighbourhoods, but they were keen to see the road functional, hoping that it would lead to an extension of the public bus network and help revive a local marketplace.[268] Finally, an important motivation guiding the youths' interest in a working relationship with the mayor was their ambition to enhance their status across the landscape of local actors. In

[265] 1 truck of sand =16m^3
[266] Particip. obs. of project partners meeting at with local gov. representatives, DSM 03 December 2014
[267] Particip. obs. at a regular meeting of project partners (CBO, NGOs, *délégués de quartier*, LG rep), DSM 16 April 2015
[268] Inf. int. with youth leaders and NGO staff after meeting with local gov. representatives, DSM 03 December 2014

DSM, after years of practically subsidising drainage, the youth perceived their relationship with the local government as one which was closer to the ideal of a partnership.[269]

7.4. The strategy of formalising

The following section develops the subject of unequal power relations. Reference to 'informality' is commonplace among Pikine's residents. A negative connotation of informality prevails, equating it to inadequacy and lack of capacity. Formalisation has become a priority for contemporary community organisations and it can be understood as a broad strategy to improve the organisation's position *vis-à-vis* other urban actors.

7.4.1. Dwelling on difference and continuity in organisational development

In Diamaguène Sicap Mbao, the youth's ambition to transform local institutional power relations was reflected in their views of their older peers who had formed the first generation of neighbourhood associations and who had been deeply involved in local flood risk reduction. The youth association's current leaders, who belong to the second generation, emphasise that a fundamental difference exists between the mind-set of the first and that of the second generation members. The new generation perceives the approach of the older generation and their activities in flood risk reduction as too restrictive in that they were reactive, too spontaneous and confined within the neighbourhood.

The mode of operation employed by the 1st generation during the early years of periodic flooding was inspired by the *Set Setal* movement of the late 1990s.[270] In DSM, those who had led the association between 2005 and 2010, were young adults at the time of the *Set Setal* movement. They naturally drew inspiration from the movement when mobilising against the floods of 2005. Such

[269] Walk with CBO general secretary and Inf. int. with CBO president, DSM 22 September 2014
[270] Transcript of a FGD with local residents/members of CBO executive committee, DSM 08 February 2016

mobilisation included fundraising through door-to-door donations, neighbourhood fairs and symbolic road blocks.

Members of the 2nd generation remember *Set Setal* as a phenomenon from their early childhood. They cited weekly neighbourhood fairs and activities for young mothers and youth, which served to promote public health and hygiene campaigns in a sociable and ludic way.[271] However, they now perceive the movement as too unstructured and ephemeral. They chose to distance themselves from its influence as they rekindled their association.

> During the workshop, various community individuals reminded the youth that they were inheritors of the urban Set Setal movement. […] An older member on the NGO's oversight committee urged the young participants that they should continue adhering to the values of the movement: at the time, people created a momentum which did not require external funding and support. Residents invested their own time and energy as they developed public spaces. This energy has been lost but the youth should aim to have that type of impact. The youth acknowledge an important parallel between their projects and the movement: that of genuine neighbourhood mobilisation through volunteering and intrinsic motivation.[272]

In DSM, once the first generation had handed over the management of the association, the 2nd generation members set out to restructure the organisation. This entailed the creation of a periodically elected executive board, supported by an advisory body consisting of former members, neighbourhoods elders and *délégués de quartier*. The executive board was complemented by specialised posts to match the thematic committees within the local government and those within projects and cross-municipal networks. Originally sporadic and seasonal, their activities developed into structured projects.

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[271] *Ibid*.
[272] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 25 April 2015

Another important difference emphasised by the 2nd generation members was their relationship with national and local authorities. In people's minds the movement represented a profound revolt against the dysfunction of the local political class while heralding the power of self-reliance and communitarian values. The *Set Setal* movement had promoted community action as a rebellious response by citizens to a state which they experienced daily as self-centred, corrupt and uncommitted. The 1st generation CBO members united to fight flooding in the first years following the 2005 crisis but, in line with the movement, they acted independently of national and local authorities.

The relationship of the 2nd generation members of the youth CBO towards authorities differed. Rather than blaming the state for inaction and distance, the new generation demanded that national and local authorities acknowledge the youth as a legitimate, capable and indispensable local partner.

> They were spontaneous. They realised that the neighbourhoods had been left to their own [during the 2005 floods]. When the ministers arrived, they had to hire a canoe. But there were neighbourhoods which did not get flooded until much later. In our neighbourhood, we faced flooding all the time. When we saw that there would be no help from outside, we decided to be in charge and we reorganised the CBO. But at the beginning all was spontaneous. There was a guy who would call at each house asking people to come out into the street and help evacuate water. When people saw them working, they would join. They started in 2005. I was a child then. I started taking part in 2009. They saw that we had some potential so they put me onto a role, with others too. But as we stayed longer, we decided that it could not remain all spontaneous. The state cannot leave us to ourselves for ever. We have some rights and to get these, we need to organise. As we got organised, we started attending different meetings everywhere where we thought we could make ourselves be heard. So to say, we knocked on many doors. But while we did that, we continued working in the neighbourhood. We were muddling through. People understood that they can trust us. There are many organisations which have trusted us. Even the *Prefect* came to tell us

that he had a large budget to spend and that he wanted us to manage a project.[273]

7.4.2. Pressures to formalise

This last section examines external pressures prompting community associations to formalise. The number of NGOs working in Pikine has grown unprecedentedly over the past decade, particularly after the second major floods of 2009. This trend has been paralleled at the neighbourhood level, where new small-scale associations for neighbourhood development (*ADQs*) have been created predominantly by local youth. The presence of international NGOs represented an opportunity to access external resources and a promise to scale up local activities and render them more effective and long-lasting. Likewise, partnering with NOGs has been an opportunity for neighbourhood associations to muster local support and increase their leverage *vis-à-vis* other urban actors.

Formalisation became a prerequisite for collaboration between NGOs and community organisations. Under a general banner of capacity development, community organisations become attuned to the operational pre-requisites of NGOs and donors. In DSM, members of community associations are routinely assessed, trained, or restructured. They have attended training in organisational development,[274] project management,[275] financial management and enterprise creation, [276] data collection methods and tools to be used for base line studies, monitoring and evaluation of their own projects.[277,278] Training is aimed at rendering organisations and community groups more transparent and accountable (through introduction of internal procedures),[279] more entrepreneurial (with the potential of becoming social entrepreneurs or service

[273] Transcript of a FGD with local residents/members of CBO executive committee, DSM 08 February 2016
[274] Inf. int. with local resident and president of the women's network of DSM, DSM 15 July 2014
[275] Particip. obs. at an NGO-led training session focussed on development of community project proposals by youth CBOs, DSM 18 September 2014
[276] Inf. int. with local resident and president of the women's network of DSM, DSM 12 September 2014
[277] Particip. obs. at an NGO training on data collection, DSM 31 December 2014
[278] Project site visit with a *délégué de quartier* and an NGO staff member, DSM 16 June 2014
[279] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 25 April 2015

providers for state or municipal agencies),[280,281] eligible to participate in large sub-granting schemes,[282,283] and ultimately accomplished in assisting NGOs in being accountable to their international donors. In this context, 'tools' have become a primary concern. Mastery of log frames, problem trees, action plans, project document templates, archiving and reporting tools have become indicators of an organisation's capacity.

Formalisation is also viewed as a must for organisations whose ambition is to extend their operations beyond the level of a neighbourhood. Traditionally, youth and neighbourhood development organisations remained strictly place-bound; however, their networking strategies have allowed them to transcend the boundaries of a single neighbourhood. In Pikine, the new challenge lies in their ability to gain legitimacy in the eyes of disparate groups of residents.[284]

A strong leaning towards formalisation has also been observed among women's organisations and their networks. In 2014, the women's network of DSM was composed of 120 women's savings groups, each group counting between 25 and 30 members. The impulse to organise these groups into a network came in 2011 from the mayor, who needed women's groups to act as a concerted interlocutor.[285] Most groups were legally registered as *GIE* and they focused on petty trade and transformation of food items.[286] The president of the network had been a fervent promoter of transforming women's traditional savings groups (*tontines*) into structured 'credit and savings groups'.[287] The principal aim in restructuring and formalising of women's groups and of their network was similar

[280] Int. with NGO senior staff member/urban development and infrastructure specialist, Dakar 26 September 2014
[281] *Ibid*.
[282] Particip. obs. at an NGO-led training session focussed on development of community project proposals by youth CBOs, DSM 18 September 2014
[283] Particip. obs. at a briefing by the Dakar office of the European Commission, Dakar, 17 February 2016
[284] Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24 April 2015
[285] Inf. int. with NGO worker during an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 25 April 2015
[286] Inf. int. with local resident and president of the women's network of DSM, DSM 15 July 2014
[287] *Ibid.*

to that voiced by members of the neighbourhood youth associations—gaining access to financial partners in order to increase opportunities to attract resources and develop projects. Rather than being civic initiatives, community actions were projects.

According to the president of the presidents of the network of women's CBO in DSM, formal management tools and methods, such as records keeping and safe cases, guarantee stability and reliability within the groups and they are a prerequisite for fruitful relations with potential financial 'partners'.[288] Prompted by an NGO, the president undertook a participatory institutional assessment of the network and developed an action plan with a "menu" for potential donors. New among the network's activities was a provision for a disaster solidarity fund.[289] Nevertheless, there appeared to have been no procedure associated to the fund's deployment and no particular desire to use rotating savings for this purpose. What resonated more were experiences from the past whereby during the previous years, striving to prevent depopulation of the neighbourhood, women had spontaneously offered help and shelter to neighbours affected by floods and those at risk of relocation.[290] In spite of structured interactions between community organisations and NGOs, neighbourhood associations in DSM frequently expressed their frustration at being locked into a relationship of dependency with NGOs who regard them as beneficiaries rather than partners.[291]

Finally, it is important to account for the ambitions of individual CBO members. In a climate of high unemployment, residents of low income neighbourhoods, including members of community organisation, diversify their strategies in search of income. The trend is one of professionalization of volunteer community work whereby many have grasped the opportunity presented in the role of a development agent (*relais communautaire*). Community development agents originate in the sector of health and education. Some have argued that the origin

[288] Inf. int. with local resident and president of the women's network of DSM, DSM 25 July 2014
[289] Inf. int. with local resident and president of the women's network of DSM, DSM 12 September 2014
[290] Inf. int. with local resident and president of the women's network of DSM, DSM 15 July 2014
[291] Neighbourhood Walk with youth CBO members, DSM 02 January 2015

of professional health agents can be traced back to the Bamako initiative (1987) which heralded a decentralisation of primary healthcare in Sub-Saharan Africa.[292] In Senegal, the management of community healthcare centres depends on dedicated and entrepreneurial individuals who act as bridges between residents and state agencies. Their role is to support the state in raising awareness, organising campaigns and contributing to the running of community health centres (Foley 2010). After 2005, when a public health crisis occurred in the flood-affected neighbourhoods, a large part of state-led emergency aid was coordinated through the network of community health agents. With the increase of NGO presence, many formalised some more, becoming the principal facilitators between NGOs and community organisations, acting as technical advisors, mobilisers and the right hand of NGO project managers.

The situational analysis elaborated above examined the process of negotiation and subtle contestation of local power relations—shedding light on how individuals use roles rather than accept them, manipulate, rather than admit to organisational and institutional boundaries. These processes and some of their cultural and political background were presented through the analysis of a distinct community initiative. Of relevance to CB-DRR is the focus on access to land. Decision-making over land is considered one of the key drivers of vulnerability and, by extension, of local actors' capacity to reduce risk (Maskrey 2011).

[292] Int. with NGO senior staff member/urban development and infrastructure specialist, Dakar 26 September 2014

8. SYNTHESIS OF FINDINGS AND DISCUSSION

8.1. Recapitulation of research questions

The principal aim of this chapter is to discuss select findings which emerged from the empirical data. I first sum up the broad lines of the research project by recapitulating the research questions, followed by a summary of the four empirical chapters. Finally, I elaborate four thematic sections in which I discuss findings pertinent to the research questions.

The set of questions addressed in this research project aimed to guide my data collection and analysis in a way to explore the connections between risk in low-income neighbourhoods in African cities, community engagement in risk reduction and local social relations. The principal question for this research project asked: How do periodic hazards and extensive risk shape social relations in African cities?

Four additional questions provided an umbrella for the scope of the research and a broadly defined structure for the presentation and my analysis of data:

- What are the social processes triggered by periodic hazards and by extensive risk in low-income urban areas? How is extensive risk produced by urban low income neighbourhoods?
- How do distinct forms of urban CB-DRR evolve in the context of periodic hazards and extensive urban risk?
- How do urban development pressures shape urban risk? How do interventions of other urban actors impact on CB-DRR?
- How are urban CB-DRR interventions embedded in existing local social and institutional relations? How are CB-DRR interventions socially produced? How do community actors use CB-DRR to negotiate local power relations?

These questions guided my empirical account of local conditions, external pressures and people's action in low-income informal settlements in the

municipality of Pikine. The aim was to produce findings which would advance current understanding of urban community based disaster risk reduction.

8.2. Summary of data presented in empirical chapters

8.2.1. Contribution of residents' practices to the production of extensive risk

Chapter 4 examined three kinds of practices which drive the production and accumulation of extensive risk in Pikine's areas affected by periodic flooding and long-term waterlogging. I have shown that over the past decade, environmental uncertainty and accumulation of risk increased not only due to direct impacts of natural hazards but also as a result of human behaviour. My reference to 'practices', rather than techniques or actions, has been deliberate so as to invite consideration of the wider socio-environmental meaning of people's choices.

Firstly, by resorting to *remblai,* which is the practice of land in-filling, residents turn the immediate neighbourhood into a fragmented environment in which bio-physical and social relations become highly uncertain. A household's capacity to mitigate against water increases risk for the neighbour. *Remblai* is also a practice which brings forward and extends stress associated with the rainy season. Moreover, it exposes communities in which cultural impediments hinder information sharing and potentially prevent greater cooperation among households.

Secondly, I have shown that depopulation of water-affected areas leads to the creation of indistinct, ambiguous pollution-prone sites that further trigger the practice of waste tipping. Depopulation encompasses a process of disintegration and fragmentation, but it also carries a myriad of expressions of people's belonging and willingness to return. Waste tipping in Pikine is a complex social phenomenon. The practice of waste tipping, which is both criticised and tolerated, has severe environmental health implications and its indirect effects pose threats to personal security within the residential areas.

Thirdly, the practice of leaking sewage remains largely overlooked. Sanitation in densely populated low-income areas remains circumvented in state-led urban development programmes. In planning and policy making, it remains dissociated from flood risk reduction, which itself remains dominated by rain water drainage infrastructure and resettlement (GoS 2014). In Pikine's dense urban environment, it is both easily noticeable and concealed at the same time. It presents immense health risk and highlights the importance of accounting for differential exposure. Assuming that empty houses and vacant open spaces serve as stocking vessels for solid and liquid waste, one wonders about the true scope of Pikine's waste and sanitation crisis. It follows that a resulting social malaise and extended stress are not social outcomes occasioned exclusively by natural hazards, but a consequence of practices that local residents perceive as a new kind of social anarchy.

8.2.2. CBO conceptualisation of flood risk evolves to promote social cohesion

Chapter 5 explored the evolution of CB-DRR interventions looking to understand how thinking which underpinned collective action evolved with the actors' experience of risk in Pikine's urban neighbourhoods. I documented how a youth CBO's conception of urban flood risk and their respective responses showed profound concern for the duration of emergency flood periods, for social cohesion, youth unemployment and neighbourhood-level safety. I showed how their predominantly structural (physical) interventions addressed imminent social issues. Technological interventions such as pumping, digging of temporary open drainage networks or underground drainage were not devised exclusively to be efficient. Instead, analysing the case of one youth CBO, O showed how the CBO used community infrastructure to provide social benefits. Pumping became a means for micro-level social inclusion and it came to represent the youth's autonomy and legitimacy *vis-à-vis* more senior and powerful local actors.

Interventions in neighbourhood drainage (secondary and tertiary drainage connections) were developed through participatory methodologies which focussed on information sharing and actor coordination, thereby decreasing neighbourhood-level tensions and potential conflict. The effectiveness of

community-managed drainage technology in reducing or preventing flood risk was not the organisations' principal objective, because local installations continued to be contingent upon defective and unreliable state-managed primary infrastructural systems. Waste pre-collection schemes elaborated by youth groups required that community organisation follow a commercial logic, but some opted to explore the role of social entrepreneurs, which benefited local residents irrespective of their capacity to pay for the service. Nevertheless, the youth's involvement in household waste management made gendered aspects of risk reduction resurface. Finally, through a small urban design project—the Park—which aimed to recover water-affected land inside a residential neighbourhood I showed how the youth took up an opportunity to engage in land management, which is a domain traditionally reserved exclusively to professionals and formal authorities.

8.2.3. Outcomes of CB-DRR initiatives are highly diverse across the city

Chapter 6 elaborated on additional aspects of what constitutes an *opportunity* in the urban space. It focused on three major state-led projects implemented at the scale of the city, *i.e.* across multiple communes within the municipality of Pikine. These projects presented both opportunities and constraints for residents in water-affected neighbourhoods and their CBOs. The chapter showed that an overarching model of participatory neighbourhood upgrading was promoted by these projects in various guises. In a tacit way, tools used to support participatory upgrading served to mediate between the state and Pikine's residents.

I have shown that state-led neighbourhood upgrading projects in Diamaguène Sicap Mbao (DSM) were popularly linked to increased exposure to flood hazard. Nevertheless, long-term engagement between local community actors and state agencies had unanticipated positive outcomes: institutional proximity and shared experience in neighbourhood development made it possible for local CBOs and NGOs to access public land and redevelop it in line with the organisations' social agendas.

In the commune of Djiddah Thiaroye Kao (DTK), organised residents tapped into a major state-led primary drainage infrastructure project. They proved to have developed an important capacity to accommodate, own and amplify the project and succeeded in having their largely informal commune serviced by primary infrastructure. However, the overall philosophy of this large primary infrastructure project remains controversial: firstly because it is designed to channel highly polluted groundwater mixed with seasonal rainwater directly into the open sea. Pikine's informal network of sites swamped by open sewage is therefore formally extended by an important element – the sea. Maintaining that the new infrastructure caters for rainwater helps depict its discharge into the sea as a benign act. This infers a disregard for water, which is a scarce resource across the Sahel region. Secondly, it promotes a faulty argument that seasonal rainfall, rather than a sanitation gap, constitutes the city's principal driver of flood risk and overall environmental risk. As the project unfolded, maintenance of large inner-city water retention basins remained a hot issue, primarily because of the state authorities' expectation that community-based organisations would act as private contractors to provide secondary and tertiary connections. Nevertheless, the chapter showed that CBOs in this commune were able to pro-actively engage with associated government agencies and draw benefits from the large state-led initiative.

In Guinaw Rail Nord (GRN), a major state-led transport infrastructure project introduced disequilibrium among local actors and clashed with groups of local residents. The project of Dakar's new toll highway was planned and implemented by the government of Senegal, its development agencies and international partners with the aim of fostering the development of the capital city's urban region. To do so it unlocked rural land previously unavailable for development and boosted the private construction industry. Cutting through Pikine, the highway connected Dakar's Plateau, the commune which houses the administrative quarters and the economic zone, including that of the maritime port, to the country's rapidly urbanising hinterland. At neighbourhood level in Pikine, the highway's benefits proved less evident and its immediate impacts more

problematic. The toll highway disrupted connectivity across and within Pikine's communes, it reshaped local topography, modified established water flows and dislocated large volumes of stagnant water. In the surrounding neighbourhoods, the road became a flagship for redevelopment projects, promising formalisation and modernisation through professional urbanism but simultaneously introducing land speculation and conflict between residents and local authorities. Resettlement of 'project affected households' led to fragmentation of the social and the physical fabric of local neighbourhoods.

8.2.4. CBOs interventions are negotiated both externally across urban actors and internally within organisations

Chapter 7 examined the influence of a wider cultural and institutional context on one community-led initiative. This context extends in time across national policies and actor engagement. Through focus on negotiations and strategy-building, the analysis focused on purposive engagement of local, municipal and state actors. Power relations among actors reflect not only standard hierarchies inherent in the Senegalese society, but also individual, organisational and institutional remits, ambitions and anticipations of opportunity. Understanding the characteristics of community organisations in urban areas, and thus their vulnerability as well as capacity is not merely a matter of administering a formal checklist. I have shown how an organisation's self-perception may be distorted and diverge from the identity declared publicly. A case in point is the youth organisation's perception of internal gender relations or the proclaimed apolitical nature of CBO members. I further examined how an organisation's actions, approach and attitudes are rooted in a past which extends beyond the actual existence of the organisation. The identity of youth organisations active in local development and in flood risk reduction has been influenced by values promoted in the late 1980s and early 1990s by Dakar's urban social movement, the *Set Setal*. However, whereas this holds at the level of values, members of youth groups have a propensity to reject the idea of proximity between generations. Instead, they emphasise difference and progress. Generational demarcation, however, is not based on inter-generational conflict. The data showed that there are valuable cultural

continuities, and their study can be fruitful when comparing subtleties in organisational and community discourse across longer periods of time, rather than over-relying on individual people's declarations (*i.e.* interviews) alone. Finally, the data confirmed a general trend towards formalisation of community-based organisations.

The following two figures provide a schematic summary of the logic of the four empirical chapters, indicating that the text was constructed in a way to explore the dialectic relationship between the domains of disaster risk and urban development as well as linkages between the scale of the neighbourhood and that of a city. A case in point is the Park project, which has been analysed from a number of perspectives.

FIGURE 10: LINKAGES BETWEEN EMPIRICAL CHAPTERS: PROGRESSION OF CHAPTERS

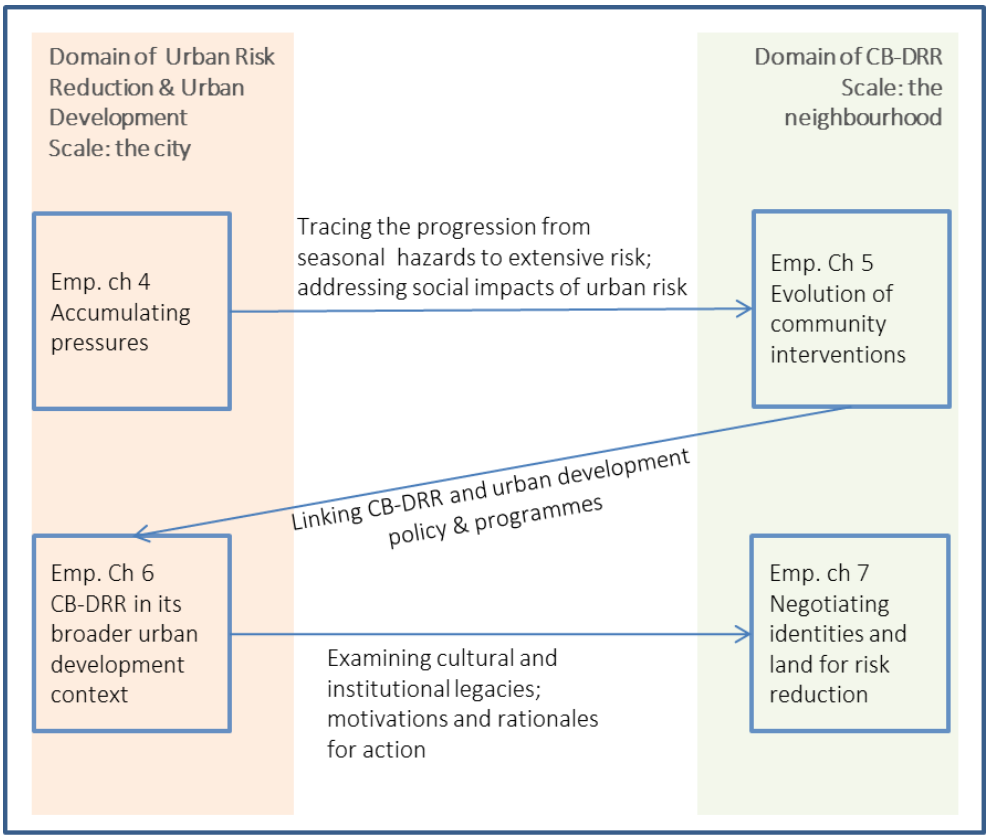
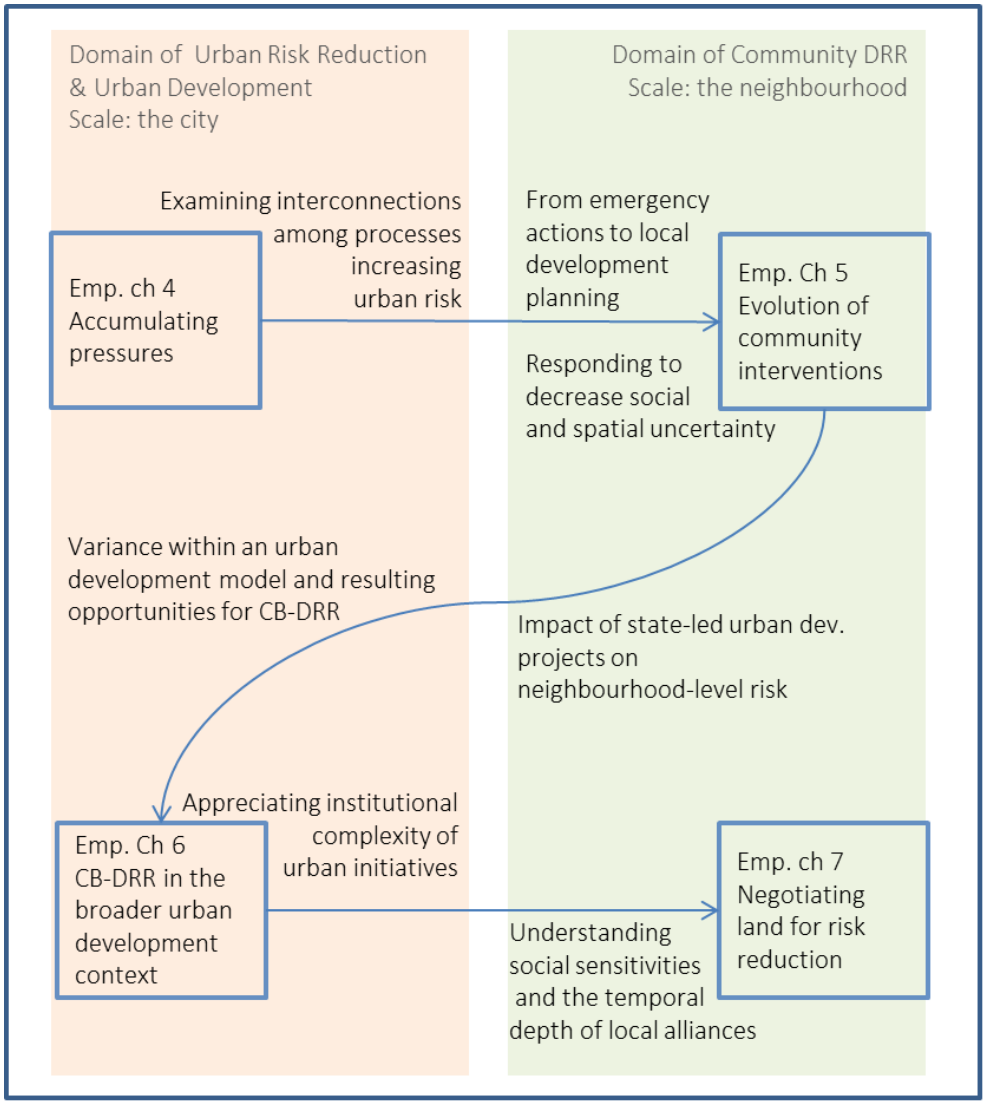


FIGURE 11: LINKAGES BETWEEN EMPIRICAL CHAPTERS: PRINCIPAL FOCI



What follows is a detailed discussion of select issues identified in the four empirical chapters. The aim is to contribute to academic and practitioners discussions pertaining to urban risk in more general terms and to urban community-based disaster risk reduction, particularly acknowledging the positive contribution of local youth.

8.3. Discussing the impacts of periodic hazards and extensive risk on urban life

8.3.1. Living with depopulation and fragmentation of the place

Over the past decade, the urban environment of Pikine has become a landscape dotted with small and large unproductive areas covered in reeds and rubbish. Below these are water-logged and periodically inundated sites which used to be residential buildings, roads, schools, markets and primary healthcare centres. Private houses have become vacant following waves of spontaneous exodus by individual households and a number of state-led resettlement interventions.

The present study contributes to scholarship of urban disasters and extensive risk by focussing on the impact of depopulation and the socio-cultural experience of coping with life in a fragmented environment. Impacts of depopulation have been studied particularly in the context of shrinking post-industrial American cities, but in studies of African cities, depopulation has not been addressed much, mostly because the general trends in African urbanism indicate growth and densification. In studies of disasters, depopulation has been counted among impediment to recovery and it has been linked to decreased availability of funds and insufficient local resources including labour (Olshansky 2005; Green et al. 2007). The present study had not been conceived as a research project in recovery, but it is concerned with processes many of which are characteristic for post-disaster phases. In many of Pikine's neighbourhoods, life since 2005 has been disrupted by water, resettlement programmes, drainage infrastructure programmes and other major infrastructure projects. As discussed in chapter 6, communes and neighbourhoods have been impacted differently. Furthermore, a great variety exists in both the nature of local recovery processes and the institutional arrangements through which local residents may be able to participate in recovery. Depopulation of Pikine's neighbourhoods has weakened CBOs whose activities depend on local membership contributions, has directly affected the functioning of women's savings groups, rendered community volunteering difficult to organise and hindered collective decision-making. As I will discuss

below, it also created conditions which rendered possible a further accumulation of risks.

Literature on resettlement impacts sheds additional light on some aspects of depopulation. Studies of resettlement have shown that individuals, families and communities who were resettled either forcefully by extreme hazard or development projects as well as through formal resettlement programmes experience a strong sense of dislocation. Empirical data analysed in this project indicates that social, spatial and cultural dislocation is a critical issue for people living in a depopulated urban environment which is socially and spatially fragmented. Dislocation implied difficulties in adjusting to a new reality which includes privation, family and community breakup, loss of property and job, disruption of productive and social networks, loss of psychological resources such as agency and secure self-identity (Uscher-Pines 2009; Pantuliano et al. 2012; Hawkins & Maurer 2011). Oliver-Smith (2005) argued that displacement after sudden-onset or slow-onset disasters is inseparable from dislocation which is not only spatial, but also cultural. Place remains an important agent in the formation of individual and collective identity (Oliver-Smith 2005; Cretney & Bond 2016). This thesis showed that in areas affected by depopulation and its adverse impacts, CBOs conceive local DRR interventions as a means to mobilise social and cultural resources in order to restore and maintain meaningful social relations. To do so, they have elaborated spatial and technological strategies which aim to prevent further disintegration of the neighbourhoods' material and cultural life.

8.3.2. Developing spatial strategies to prevent household-level practices which increase extensive risk

For over a decade, residents of Pikine's low income neighbourhoods have been both affected by and contributed to the creation of extensive risk. Whereas on three occasions in 2005, 2009 and 2012, seasonal rains resulted in countless disasters scattered across the city, it was permanent waterlogging which has proven to be significantly more consequential in driving a process of risk normalisation. In this context, changes in land use and structural modifications of

space have led to a fragmentation of the local physical environment and a cascade of diffused, small-scale everyday hazards. The case of Pikine shows that under conditions of protracted stress, there is a danger that high risk spaces increase in local areas.

The first key finding of this study is that depopulation has been one of the principal indirect drivers in the production of extensive risk: depopulation triggered collective behaviour which went on to contribute to a cascade of small-scale everyday hazards in water-affected areas. One contribution of this research is an analysis of the process through which the accumulation of everyday hazards originates in the context of depopulation and protracted crisis. A cascade of everyday small-scale hazards is the product of residents' waste tipping and sewage leaking practices which follow a distinct spatial logic: abandoned sites which originated as by-products of resettlement interventions and of development projects become ambiguous spaces which act as attractors for harmful practices which amplify extensive risk. Of importance here is people's perception of the functions of space as well as their perpetually reinvented relationship with urban space. People's everyday uses of urban space reflect the value they attribute to these spaces. In protracted crises, space loses its productive functions and cohesive value.

Community-based organisations are particularly sensitive to these risk-producing processes. Whereas CBOs lack direct means to ban households from engaging in risk-increasing practices, they can develop distinct strategies to indirectly target such practices. In Pikine, in order to discourage polluting practices and prevent further spatial fragmentation of water-affected neighbourhoods, CBOs developed spatial strategies: they chose to change the function of ambiguous land, thereby hoping to modify residents' everyday practices. By converting ambiguous spaces into places with restored sociable and productive functions, CBOs sought to break the cascade of everyday small-scale hazards and the spiralling of extensive risk. Such a conception of CB-DRR uses urban design in a way to promote sociable urban spaces and to foster positive ties among residents.

8.4. Discussing community-based structural interventions as a way to maintain constructive social relations

8.4.1. Decreasing environmental and social uncertainty through networked community-led infrastructure

Another practice which increases local risk is *remblai.* As individual households mitigate against flooding by episodically raising their properties, they dislocate flood risk. Schaer (2015) classified this practice as mal-adaptation. Structural interventions undertaken independently by households are generally done in an incremental fashion, which means that the living environment is perpetually refashioned. *Remblai* modifies local topography and subsequently deepens uncertainty about the future course of water. The fact that households (and organisations alike) rarely share information about future plans and intentions contributes significantly to a straining of neighbourly relations in Pikine. As I have shown in chapter 4, a climate of distrust, stress and anxiety ensues among local residents as less resourced households become apprehensive of risk displaced by their more affluent neighbours . The discomforting consciousness of flood risk and anxiety previously characteristic of the rainy season is felt months before the start of the actual rainy season. The resulting social malaise and uncertainty about the surrounding physical environment are felt profoundly by local residents. Whereas CBOs have no means to significantly influence private decisions about *remblai,* many of their interventions can be understood as attempts to decrease the uncertainty of the living environment and to enhance social cohesion.

Pikine's infrastructural installations for flood risk reduction, be it individual, community-led or state-built, permeate the urban landscape in many guises. In neighbourhoods around recently constructed water retention basins and underground drainage canals, these installations are the destination of open seasonal canals used for leaking septic tanks from housing compounds. Open canals and leaks converge towards formal outlets, but disappear before reaching them, seemingly conforming to the official rule which prohibits their connection. In other neighbourhoods such open canals dematerialize after a few meters,

indicating the invisible yet strict boundaries between neighbouring properties. During the period of the rainy season, CBO-managed temporary seasonal drainage canals compete with segments of privately funded secondary drainage connections. In most neighbourhoods, temporary canals which are intended for rainwater, but which inevitably gather all liquid waste, lead into abandoned low-lying sites. CBO initiatives to network temporary drainage canals within and across neighbourhoods, connecting them to national infrastructure are thus an important collective contribution. During the first months of my fieldwork, I paid extensive attention to temporary seasonal open drainage. I was keen to understand the process of creating such networks and the implications for all of the actors involved. Equally, I anticipated that local social relations would be played out through such interventions.

The analysis of empirical data showed that community infrastructure is an opportunity to share information and a way to increase transparency of local decision-making. Ahead of the rainy season, the trajectory of temporary drainage is publicly discussed on a number of platforms, which provides an opportunity for residents, CBOs, local government representatives and relevant state agencies to engage with each other. Although there are exceptions, the possibility for everyone to be part of the collective discussion is in sharp contrast with the secretive way individual households take decisions which impact their neighbours. Annual discussions about the passage of water are principally a means to minimise tensions among neighbours and provide an outlet for widespread stress.

In an urban environment characterised by high groundwater levels, temporary seasonal drainage shortens the duration of flood rather than preventing it completely. Reducing the number of days one has to withstand flooding is crucial for families which stay during the rainy season as well as those who leave, temporarily seeking refuge in other neighbourhoods. The temporal consideration is important for local residents because it renders critical periods more manageable. Temporary open drainage is thus an important means to reduce the overall uncertainty associated with the rainy season.

Once in place, temporary seasonal drainage is a way to increase the predictability of water flows within and across neighbourhoods. Over a period of five years, the route of the seasonal drainage network has become largely stabilised, an aspect which counterbalances uncertainty and provides households with the possibility to estimate impact in advance. Community temporary drainage thus brings more predictability and counteracts adverse impacts of household-level *remblai*.

A word of caution is required in conclusion to the above discussion of the social functions of temporary drainage networks. Temporary drainage networks connect to major state-managed pumping stations. The effectiveness of temporary drainage is frequently compromised by failures and blockages of the primary installations. Community interventions are thus kept contingent upon systems operating both technically and institutionally at scales beyond the community. It is therefore all the more relevant to focus on the social, rather than the technical benefits of this type of infrastructure.

Finally, focussing on questions of legitimacy also explains why approaches focused on certain types of technology persist among Pikine's residents even though it has been acknowledged that they are highly inefficient. Motor pumps are one such example. Pumping has been associated with early government humanitarian interventions. Having experienced the failure of state-led response, CBOs generally tend to dissociate themselves from this technique. But because ownership of pumps has allowed CBOs to act independently from public emergency services, pumping has also become associated with autonomy and legitimacy. On multiple occasions during my fieldwork, I was surprised to see CBOs show greater pride in their motor pumps than they did in the community drainage networks.

8.4.2. Promoting social cohesion through youth-led DRR

In the context of chronic stress, supportive and constructive social relations are perpetually put to test. One of the key findings of this research is that community-based organisations are deeply concerned about social cohesion across water-affected neighbourhoods. Recovery literature emphasises the importance of the social realm because post-disaster periods reflect inequalities inherent in every society and tend to amplify existing social tensions (Tierney 2007; Tierney & Oliver-Smith 2012). Literature examining the role of social capital in the recovery process emphasises positive effects of social ties on community recovery (Aldrich 2010; Nakagawa & Shaw 2004).

Empirical data presented in this thesis documented the process through which some youth CBOs have grown conscious of the need to foster social cohesion in order to counteract adverse impacts of risk-increasing practices. Although CBOs often presented themselves as champions of structural responses, they nonetheless displayed deep concern for the social tenacity of urban communities. Public concern for social cohesion indicates that the fragility of a social equilibrium is an important concern for residents of water-affected urban areas.

Contradictions between discourse and daily experiences of a community

Recognising that certain household practices lead to a social malaise is to acknowledge a contradiction. Pikine's residents are great advocates of mutual help, as they emphasise the necessity to act as one during crises. In their discourse they express deep pride in local solidarity. And yet, before the rainy season, an atmosphere of distrust and silent suspicion among neighbours betrays a fragility in neighbourly relations.

Waste tipping and sewage leaking not only increase the overall risk to public health, but disproportionately tax households living in the vicinity of sites which have become tipping sites. During my fieldwork in Pikine, I witnessed numerous disputes between residents. CBO projects, both those in community waste management and those which aim to recover and regenerate polluted sites, aim

to prevent situations where frequent blaming and shaming erodes mutual respect.

Limited exchange of information about individual mitigation actions is an important cause of distrust among neighbours. Although in my research I have not paid particular attention to the notion/phenomenon of sabotage, I have witnessed multiple situations in which residents expressed concern about seeing an planned intervention unexpectedly stalled. Pikine's residents thus generally act with a distinct cautiousness preferring not to share information about a future project or at best publicising it at the very last moment. Consequently, residents become weary and distrustful of each other, suspecting all activity in their vicinity to be a new source of harm and stress.

Waste tipping and sewage leaking are practices which indisputably increase risk to public health, but unattended waste exposes local residents to a further burden, that of criminality and personal insecurity. Water-logged and waste-filled ruins and public spaces act to fragment the living environment and produce a network of liminal spaces acting as networked hubs for illicit activity. The local environment thus becomes increasingly propitious for crime and violence, real or perceived, eroding trust and relations of mutual support among local residents.

Over the past decade, disruption of secondary transport routes caused by long-term waterlogging has led to changes in transport routes at the scale of multiple communes. Open stagnant water came to obstruct people's and goods' everyday mobility and created new layers of socio-spatial exclusion. Development projects at the scale of the city and the urban region further thwarted local level connectivity. CBO activities which strive to recover areas affected by water and waste by establishing pedestrian connections between local areas thus need to be understood as endeavours to revive a sense of local safety. Such initiatives are particularly valued by women who have seen their mobility curtailed out of fear for personal security.

Being spatially connected with the rest of the city also stands for one's belonging to a city as it makes possible one's participation in the city. I have shown that transport infrastructure and mobility have been a central component in neighbourhood upgrading projects. For local residents, roads and public transport have been linked to the process of formalisation of an urban area. Ensuring that their neighbourhoods are incorporated into the city's network is an aspiration openly incorporated into CBO actions. By redeveloping polluted spaces and attempting to render functional the water-affected road network, CBOs subscribe to the process of formalisation of Pikine's neighbourhoods. Finally, it is a way for CBO members to assert their role as rightful actors in the production of the city and the management of urban affairs.

Community heterogeneity and a CBO's struggle for inclusion

Literature on community development abounds with reminders that communities are heterogeneous social units (Dodman & Mitlin 2011). Disaster scholars adopting the perspective of vulnerability emphasise the unequal exposure and capacity of distinct social groups. Whereas the data collected for this research project does not focus on individual or household characteristics, the issue of social stratification has nonetheless been present in data related to the structure and internal workings of youth community organisations. Socio-economic disparities permeate urban communities and they are mirrored within community organisation. I have shown that leaders of neighbourhood youth CBOs actively seek to overcome internal differences and latent tensions between members. In so doing, they actively promote social cohesion within their age group.

Finally, community organisations are also an important actor facilitating integration in an urban context characterised by internal displacement and high mobility. Youth CBOs offer the possibility of integration for newcomers, mostly tenants who often flee water in other neighbourhoods. In so doing, the CBOs temper the social effects of high internal migration and offer a structured framework for new encounters, exchanges and opportunities to collectively envision a shared future.

8.5. Discussing cross-scale perspectives and urban CB-DRR

Urban development and production of risk are inseparable. In chapters 6 and 7, I documented a diversity of linkages between urban development projects, their contribution to local-level flood risk and the ways in which they encouraged or deterred local residents to act.

8.5.1. Accounting for variety in recovery

A cross reading of the four empirical chapters suggests that urban CB-DRR is characterised by a breadth and diversity of actor interactions, which extend beyond the neighbourhood. I have shown that community organisations are sandwiched between two powerful forces: on one side these are individual yet interdependent interventions by households, which cumulatively modify the nature of hazards and amplify risk (Chapter 4). On the other side are extra-local development pressures frequently linked to national or regional economic policies (Chapter 6). Community organisations are in a perpetual search for effective interaction with households and government agencies (Chapter 5). Equally, they need to carefully manage their closest institutional environment: formal stakeholders at neighbourhood and commune level, dormant stakeholders which may nonetheless still hold considerable influence over local decisions (such as the agency FDV), but also the organisations' own members whose diversity and desire for self-realisation requires a lot of attention and care (Chapter 7). In chapter 6 and 7 I showed that CBOs engaged in urban CB-DRR pursued their goals in association with many other urban actors, few of whom were exclusively focussed on disaster management or risk reduction.

State-led urban development projects shape the way different parts of Pikine experience risk. Furthermore, state-led interventions are inscribed in the logic of project-based development; implemented in select parts of the city, these projects increase the diversity of experience of recovery processes in Pikine's neighbourhoods, both in terms of its speed and its nature. The governance of recovery is one such domain. I have shown that across communes and neighbourhoods, different constellations of state and non-state actors shape the

way needs are identified and prioritised and influence the selection of those who contribute to the formulation of solutions and ultimately those who engage in action. In Diamaguène Sicap Mbao (DSM), the youth CBO and its support NGO found themselves torn between a newly elected local government and senior community authorities. In Djiddah Thiaroye Kao (DTK), whereas a large state-led primary infrastructure project promised residents a long awaited relief from water, new concerns were raised about the role of local government and local CBOs in the future maintenance of the extended networks. Finally in Guinaw Rail Nord (GRN), existing relations between local government and residents were damaged by the implementation of a state-led programme and complicated the production of local drainage infrastructure.

8.5.2. Facing the adverse impacts of signal noise

Enquiring about the way in which incentives and disincentives operate in the recovery process in New Orleans, Chamlee-Wright and Rothschild (2007) argued that mixed signals sent by federal and municipal agencies decreased the capacity of individual households and neighbourhood communities to return, rebuild or invest in life within the affected areas. Signal noise is the unintended consequence of poorly conceived policy interventions. I have shown that in Pikine, state-led city-wide development projects sent mixed signals to local residents and organisations. Governance of the recovery process is one such domain and the case of Dakar's drainage masterplan serves as a case in point. The masterplan provided a blueprint for the city's networked infrastructure, but its implementation through independently financed projects implied a high probability of long delays in the networks' implementation accross different areas.

In the commune of DTK, an alliance of civil society organisations was instrumental in getting the commune enrolled as one of the four priority zones for the implementation of the drainage masterplan. Conversely, in the commune of DSM, rumours about the future redevelopment of the Sam Sam marsh stalled initiatives envisaged by CBOs and NGOs. Two formal policy documents further fuelled the uncertainty because they lacked precision about the means and the time of their

implementation. Uncertainty and confusion among actors thwarted local initiatives, including a number of local CB-DRR projects.

8.5.3. Distortionary effects of state-led urban development projects

State-led urban development and recovery projects have also been known for having distortionary effects on local economies (Chamlee-Wright & Rothschild 2007). In Pikine, the long expected toll highway project distorted local economic conditions in two ways. Firstly, World Bank standards for compensation of project-affected persons applied to large state-led projects became a popular household reference, making it *quasi* impossible for projects managed by less powerful government agencies or by local governments to offer partial compensation or to negotiate different resettlement terms. I have shown that local conflicts over compensation, such as those related to secondary neighbourhood drainage in the commune of GRN, created an impasse which rendered subsequent spatial interventions in the densely built neighbourhoods highly complicated.

Secondly, strategic micro-poles of growth that formed around the highway's exit gates triggered an unprecedented wave of house building and house reconstruction in the unplanned neighbourhoods in GRN. The vision of new opportunities, however, clashed with the overall character of the neighbourhoods, most of which remained densely built with inadequate local access and missing infrastructure, thus preserving the inherent vulnerability of the unplanned neighbourhoods. The construction boom increased risk as it made future initiative to restructure the neighbourhoods considerably more difficult.

8.5.4. Maximising the value of institutional continuity

Distinct urban development projects in Pikine have had positive impacts on local organisations active in disaster risk reduction in that they created an organisational continuity which allowed for a transfer of mutually beneficial relations across generations of organisations. Whereas frequent duplicity of government executive and control agencies is commonly said to result in dysfunctional urban management, I have documented instances when dormant public bodies facilitated the implementation of community DRR initiatives. The state-led neighbourhood upgrading project in DSM started in the late 1980s and took over two decades to materialise as it was rolled out intermittently until 2004 by the para-statal agency *Fondation Droit a la Ville* (FDV). The success of this upgrading project was reversed by the floods of 2005, after which long-term waterlogging and depopulation of neighbourhoods, halted local development for over a decade. Nevertheless, in 2014, the dormant agency FDV resurfaced as a key partner to community organisations working on local risk reduction. Acting outside its original remit, the agency made highly priced urban land available to CBOs and their support NGOs. This arrangement was made possible owing to institutional continuities inherent in organisational structures set up two decades earlier with the aim to support community participation in local neighbourhood upgrading programmes. Past participatory planning projects and interventions, even where unsuccessful in their primary goals, thus created a legacy for collaboration among state agencies and civil society organisations.

8.6. Discussing the evolving organisational cultures and CB-DRR

8.6.1. Negotiating legitimacy and power

Community organisations face perpetual pressure to adequately represent local residents' needs and aspirations as well as to convince other state and non-state actors of their roles as rightful partners. In chapter 7 I examined the intricacies of the everyday politics of legitimacy where competition for resources remains just as important as competition for legitimacy.

Access to land being a highly controlled issue, I have shown that in DSM, the youth's project which aimed to develop a park can be read as an important statement about the standing of this organisation *vis-à-vis* other local actors. The youth's legitimacy was repeatedly on trial as they renegotiated common grounds with actors, each guided by a different approach to local development and pursuing a discrete agenda. I have shown that a number of factors contributed to the CBO's success. Firstly, the youth organisation's sustained involvement in emergency response and development of autonomous medium-term risk reduction activities made it justifiable for the youth to address national institutions which are not its habitual interlocutor. Secondly, NGO involvement modified local power relations and it played an important role in the legitimacy of CBOs. As the life of many NGOs spans increasingly across decades, institutional memory facilitates ties between NGOs and government bodies – creating opportunities for direct collaboration or less explicit forms of support. Dakar's history of participatory development projects makes this point particularly salient: mapped onto organisational and institutional links are personal relationships across public service employees and civil society. In Pikine, state agencies have been keen to engage with CBOs that were supported by NGOs: in the past, NGOs such as Enda Tiers Monde were involved in the constitution of the agency FDV which came to represent a formal mechanism for large-scale programmatic implementation of participatory neighbourhood upgrading. Many of Enda's past and present teams maintain collaborative relations with the agency FDV. As I have shown in the case of initiatives in the commune of DSM, the support of two other NGOs opened an avenue for youth organisations to engage in land development, a domain which is highly contested and which has rarely been accessible to junior actors (Baller 2007).

Nevertheless, I have shown that the youth's CB-DRR initiatives were not without tensions and internal contradictions. For instance, in DSM, the youth CBO was under pressure by senior community leaders, *délégués de quartier*, who expressed apprehension over the youth's alliance with newly elected local government representatives. Such tensions can be explained as conflict of interest

at personal levels, but also as expressions of power relations grounded in a particular institutional context. The latter perspective can be read as follows: previous participatory urban planning and upgrading projects produced local actors endowed with strong ownership over local development processes. Among these were community leaders, *délégués de quartier,* who had been members of local project committees, and who thus enjoyed a double legitimacy as representatives of local residents and as local agents backed up institutionally by national and para-statal agencies for which they facilitated work at local level. Because many projects in urban participatory neighbourhood upgrading started before the advent of local government in 1996, senior *délégués de quartier* perceived newly elected politicians as lesser actors. In 2013, a new amendment to the decentralisation law introduced elected local governments as mandatory partners in all development-related interventions. Many local actors came to see this imposition as a threat to their authority and embarked on an uneasy readjustment of local power relations. This was particularly true in communes where divergent political orientations led to alienation of community leaders, other local influential opinion makers and elected local government representatives.

Structural ties among CBOs, NGOs, state agencies and local governments are a legacy of the 1990s and early 2000s, a period which was characterised by the institutionalisation of participatory planning approaches to local urban development. Nevertheless, CB-DRR in Pikine cannot be solely understood as a product of propitiously designed participatory processes. The findings of this project show that in order to do justice to urban CB-DRR, it is imperative to examine its urban socio-cultural roots.

8.6.2. Building organisational culture for youth-led CB-DRR

The youth CBOs which I have discussed in this thesis are formally registered as neighbourhood development associations (ADQs). ADQs are anchored in an urban culture which has been moulded by a memory of the anti-establishment *Set Setal*

urban social movement of the late 1980s.[293] *Set Setal* has been of critical influence for the way neighbourhood youth organisations in Dakar and in Pikine conceive of themselves as independent and volunteer-based. Nevertheless, youth CBOs have actively sought to break the connotation with this movement which they deem to have had been too informal. Youth CBOs are also in perpetual rivalry with sports-based associations (ASCs) which have permeated Senegal's urban culture since the 1960s.

Youth organisations which focus on neighbourhood development resemble sports associations in that they construct their identity through a re-imagination of their neighbourhood, while simultaneously emphasising their role as national and global citizens. Both have a strong ethos of volunteering and inclusion. They both organise regular neighbourhood clean-up sessions and fundraise through member and household contributions, the latter being collected though door-to-door campaigns managed by young women.

8.6.3. Formalising, a requirement and a generational statement

Pressure to formalise, documented in chapter 7, has been a phenomenon observed across different types of community organisations. Findings of this research show the importance that CBOs give to formalisation. Youth CBOs use formalisation as a means to distance themselves from the older generation of CBO members, whom they associate with the *Set Setal* movement and with spontaneous collective action. Formalisation is also a condition which allows CBOs to operate with a multitude of formal actors, extending their presence beyond the limits of a neighbourhood. One manifestation of formalisation has been CBOs' organisational restructuring which involved the creation of specialised internal committees conceived to map onto the thematic committees of local government. Such internal structuring has facilitated the CBOs' formal involvement in local development planning. Volunteer flood committees created

[293] The *Set Setal* movement has been outlined in the review of literature, section "Dakar's recent urban political history", and it was further discussed in chapter 7.

under the auspices of local governments, many of which were established after 2009, operate on this very basis.

In the case of engagement between CBOs and NGOs, formalisation takes place through a series of incentives to conform to formal requirements set up by NGOs. Such requirements often fall under the rubric of 'capacity development'. I showed that whereas this kind of formalisation motivates CBOs to reflect strategically on organisational development, it may also indirectly increase inequality within CBOs. As documented in chapter 7, formalisation of youth CBOs led to both encouragement of young women to take up important roles in CBOs, but it also prevented illiterate members from taking equal part in some of the organisation's activities. Such contradictions are a source of concern for CBO leaders as they undermine the CBOs' commitment to inclusion and compromise their activities to foster social cohesion within and across neighbourhoods.

9. CONCLUSION

9.1. Summary of the research project

This thesis presented a qualitative enquiry into the nature of urban flood risk and the role played by community-based disaster risk reduction (CB-DRR) in responding to urban risk. I developed a case study across areas in three communes in Pikine, the municipality commonly known as Dakar's low-income largely informal peri-urban suburbs. For over 15 years, large parts of the municipality have suffered from long-term waterlogging and seasonal flood emergencies during the rainy season. Senegal has a vibrant urban culture epitomised by multiple types of community organisations, many of which, although not all, are youth-based groups and some of them benefit from long-term NGO support. This thesis focused on neighbourhood community organisations engaged in flood risk reduction.

The overall aim of the project was to contribute to the understanding of ways in which periodic hazards and extensive risk shape social relations in African cities. To do so, Pikine's case was used to gain specific knowledge about four aspects of urban risk and CB-DRR. Firstly, I documented extensive risk at the scale of a neighbourhood and analysed its production by looking at distinct social processes triggered by periodic hazards and long-term waterlogging in the commune's low-income areas. Secondly, I looked at the evolution of distinct forms of CB-DRR within a neighbourhood affected by small-scale everyday hazards and extensive risk. Thirdly, I analysed the ways in which three major state-led urban development projects implemented at the higher scale of the municipality and the city region impacted on neighbourhood level flood risk and shaped community responses. Finally, I focussed on understanding the social production of urban CB-DRR, examining the embeddedness of anti-flood action within a wider institutional and social structures characterised by different actors' uneven access to power.

Guiding my enquiry was the approach of situational analysis which focuses on interactions and encounters engaged in by different actors. Situational analysis has been used to study African urban sociality. A situation refers to a moment of opportunity which arises when actors use their multiple social roles but also rely on routines and strategies in order to achieve their goals. The aim of such analysis is to understand the meaning given to situations and its implications for action.

The sampling process followed grounded theory method. I used qualitative data collection methods to gather detailed organisational data about one youth group active in local flood risk reduction. This was complemented by more varied data about the history, structure and activities of another dozen community organisations. The primary tool for data collection used in this research was participant observation of engagement between CBOs and other urban actors during project implementation, strategic meetings, or public events and observation during workshops and training sessions organised by NGOs and attended by youth CBO members. Semi-structured interviews with local residents, community leaders, NGO staff and urban planning professionals were the second method most employed for data collection.

9.2. Contribution of the study

The first contribution of the study relates to the production and the nature of extensive risk in low-income urban areas. This research indicates that two interconnected processes constitute the production of extensive risk. Firstly, a physical environment which is subject to periodic intensive hazards (*e.g.* seasonal floods) and permanent environmental deterioration (*e.g.* groundwater sewage crises) is continually eroded and fragmented. Associated with these physical processes is an increasing fragility of local social relations. The impact of extensive risk on social cohesion is an issue which has not been studied in great detail. The findings are broadly applicable to other low-income areas in African cities and even to cities outside of Africa with similar socio-economic and physical characteristics and high exposure to flooding. Data for Pikine show that over the past decade, many of the municipality's water-affected neighbourhoods were

depopulated and deserted land became ambiguous space, an avenue for households to engage in a cascade of risk-increasing practices. Household-level practices provided protection for some increased risk for others. Mutual distrust and barriers in information sharing fed into a spiral of deepening uncertainty and fragility of local social relations. I argued that the impact of frequent small-scale disasters and everyday hazards on social relations, and neighbourly relations in particular is just as damaging as the deteriorating physical environment and essential public infrastructure. A socially and physically uncertain urban environment is the outcome of extensive risk.

The second contribution of this research pertains to community-based disaster risk reduction and relates it to the findings about extensive risk. I showed that at first sight, CB-DRR evolved largely around technical interventions such as drainage and waste collection. I argued that the significance of these forms of CB-DRR is not purely technical, but that they have a broader social purpose as they serve to offset the sources of social stress and uncertainty. CB-DRR counters the fragility of neighbourly relations. It provides a platform for exchange of information and it is a way to introduce transparency into different local actors' plans and agendas. This research documented that throughout a decade of evolving CB-DRR interventions, the social agenda was an omnipresent concern and it was always factored into the CBO's conception of flood risk. Contributing to the argument for not dwelling on the technical aspects of community drainage and waste collection is their relatively low effectiveness. This is because projects in drainage and waste collection depend on the wider state-managed networks of drainage installations which are often defective and unreliable. This is not to say that the technical aspects of structural interventions *per se* are not a valuable subject for the study of disaster risk reduction. For the researcher they are a fruitful entry point into people's relationship with the urban space, nature and each other. Because their implementation requires space, money and authority, they provide valuable information about power relations.

An important empirical contribution of the research relates to the institutional environment which enables a meaningful engagement of the state and the citizens. I identified and analysed the implications of a formal model for community participation in neighbourhood upgrading applied to three major state-led urban development projects implemented in Pikine. These projects produced important variance in the way they introduced or denied an opportunity for residents and community groups to contribute to the improvement of their water-affected neighbourhoods. The three state-led urban development projects included an initiative the aim of which was to upgrade a number of Pikine's informal neighbourhoods (1991-2004), the first phase of Pikine's primary drainage infrastructure project (2013-2017) and the construction of Dakar's new toll highway (2006-2016); all three projects involved processes at the scale of the city and therefore an occasion for residents and community groups to engage with higher level state institutions. Commitment to formal participatory planning procedures and use of associated tools by the state created an institutional environment which enabled that CBOs be regarded CBOs credible actors and potential partners. Positive outcomes were unanticipated because they resulted from situations where the initial state-led projects and distinct CBO initiatives had no prior links. Productive engagement of actors took place because of the introduction of an overarching model for participation. The model created an organisational proximity which made the activities and interests of CBOs match the remits of otherwise distant state agencies. Senegal's neighbourhood upgrading programme was largely unsuccessful in attaining some of its principal objectives, but this research showed that the omnipresence of the model and its applications across diverse projects coalesced into positive outcomes when it came to supporting CBOs engaged in local reduction of flood risk a decade later. Broader implications of the findings therefore confirm the overall benefit of participatory approaches to urban development and show that the positive outcomes may be largely unanticipated and manifest in time across different domains.

A concomitant analysis of the participatory model across a longer time-span nevertheless indicates changes in the nature of participation. In Chapter 2, I reviewed literature about interventions in urban development planning which took place in Dakar during the 1980s and 1990s. Guibbert and Abdoul (2005) argued that over the two decades, the initially innovative approach to Dakar's urban development lost its radical edge and its transformative potential. Instead, participatory planning became an exercise in project management promoted by international and para-statal organisations who set out to institute a new urban governance regime. Contributing an analysis of three state-led projects, the present research extends this periodisation, indicating that a strong continuity in participatory urban development approaches exists. However, the primary purpose of the model for participatory urban development, buttressed by a set of tools, became to organise residents into community groups with the aim of making them a structured interlocutor for the state. This confirms the proposition that more radical urban approaches had been replaced by pragmatic and management-focussed methodologies. Nevertheless, such findings open the scope for analysis of local-level tactics and strategies, which is how additional understanding of CB-DRR was sought throughout this research project.

The fourth contribution of this thesis is both empirical and theoretical in that it relates to urban culture and institutional continuity. I examined urban CB-DRR across institutional and temporal scales. My analysis of the legacy of Dakar's *Set Setal* civic movement on the domain of community-based disaster risk reduction showed the importance of urban political history on the way relatively recent problems are addressed by urban actors. Diouf (1992; 1996) argued that the study of the *Set Setal* movement exposes processes through which an urban culture in Senegal has been shaped by a periodic conflict and realignment between community groups and political elites. The *Set Setal* civic movement characterised an important period in the late 1980s and early 1990s during which neighbourhood committees formed in search of a new moral order and local self-sufficiency. It was a dispersed yet intense revolt against tightly bonded elites of traditional elders, religious authorities and politicians who demanded

subordination of the younger generation. The movement's philosophy was based on the promotion of individual and collective diversity, plurality and autonomy which were to be cultivated within an informal social and economic urban environment. Fredericks (2012; 2009) extended the study of the movement to show how over a decade later, its legacy shaped men and women's approaches to domestic waste collection and Baller (2014) provided a detailed account of how the culture of football-focussed youth groups (ASCs) promoted neighbourhood-level activities closely linked to the *Set Setal* movement. The findings of this research project show that the legacy of the movement continues to shape the pro-social nature of Pikine's youth organisations engaged in the development of their neighbourhoods and the reduction of flood risk.

I showed that the legacy of *Set Setal* is actively denied in the youth CBO's discourse, but it is vividly present in their actions. Their discourse accentuates distance from the movement and instead emphasises a new ambition which equates legitimacy of community groups with highly formalised neighbourhood associations. In this respect, the radical philosophy which valued informality and cherished plurality as well as inclusion of youth's alternatives becomes subdued and disciplined through the influence of other powerful urban actors. Nevertheless, Pikine's youth CBOs' actions can still be read as a subtle revolt against the traditional imperative of inter-generational subordination. I addressed this aspect in my analysis of negotiations aimed at securing a youth group's access to land, which—although traditionally not a domain open to youth—they identified as central to their risk reducing actions. The initiative comprised a large share of strategy building across a broad set of actors and showed that at stake in a small CB-DRR project was the youth's claim for inclusion in the public realm. Rather than attributing such social situations to the legacy of the *Set Setal* movement, I propose that some CB-DRR projects can become further examples of manifestations of the youth's politics of inclusion and legitimacy.

Finally, this research contributes to literature on urban youth and youth involvement in urban CB-DRR. Inter-generational power struggles are present in

the urban social realm, but they are not geared exclusively in the direction of conflict, violence or crisis as suggested by some authors (Abbink et al. 2005). I have already indicated that urban youth's activities and their sensibilities testify to their strong sense of responsibility for social cohesion. Youth CB-DRR projects reflect a commitment to inclusion, collaboration and discussion. In this respect, the findings of de Milliano (2015) resonate with my own experience when she argues that inclusion and support of youth initiatives strengthen community resilience because "adolescents show high levels of pro-social attitudes […] including: responsiveness to others, empathy and finally a high sense of duty to one-self and others" (2015: 174). Together, these are good reasons to promote youth organisations as pillars of community-based disaster risk reduction.

The methodological contribution of this study relates to the grounded theory method. The method allows for a gradual evolution of the research process in directions identified intermittently as pertinent within a given empirical setting. My data collection was focussed around a particular youth-led project, which allowed me to study real life interactions and strategic negotiations between local actors. People's frequent reference to urban upgrading made me extend my focus to analyse instances of application of the participatory upgrading model; I documented variance in the application of the model and its implications for CB-DRR. Flexibility inherent in the grounded theory method allowed me to move my focus smoothly from intensive risk associated with the rainfall season to extensive risk which permeates the African urban environment irrespective of a season. The same goes for developing the study from an initial focus on one form of CB-DRR (community-led seasonal drainage) onto an effort to capture the evolution of rationales and historical foundations for local flood-reducing interventions and finally the broader institutional environment which shapes opportunities for local-level processes in strictly non-linear ways.

9.3. Limitations of the study

Firstly, this study was conceived to address urban risk in relation to flood risk, but there are other types of climatic, economic and human security risks present in African low-income urban areas which I have not addressed. Nevertheless, where possible, I have tried to point to the broader relationships and cascades among different types of hazards and the continuum of disaster risk. My choice of sampling for CBOs who benefitted from NGO support has potentially important implications for the findings. This choice was made during my preliminary fieldwork by the chain of partnerships between my industrial sponsor, their partner NGO in Dakar and the NGO's local community partners. Later, during the first phase of my main fieldwork, I chose to study one of these community organisations, which was also the beneficiary of another local NGO. Some of the findings presented in this thesis are directly relevant to NGO work, and in that respect, my sampling has been justified. Nevertheless, I am aware that sampling for community and youth organisations with no NGO support might have produced other type of data.

9.4. Future research

The process of producing this thesis showed that two other themes for future research and associated advocacy would be of value. Firstly, Pikine' sanitation crises is grossly downplayed and its contribution to urban risk, including flood risk, is rarely officially considered. Initially, this denial is difficult to sense amidst a multiplicity of thought about the principal drivers of flood risk. Among the reasons commonly recounted is unlawful settlement of low lying flood-prone areas by rural migrants and households evicted from Dakar's more prosperous communes, selfish acts of modification of water flows by *remblai* undertaken by local residents, objectionable blockages of water flows by major transport infrastructure, the muddied notion of groundwater rise, or abstracted references to climate change. Individuals and organisations, lay and professional, refer to the above concomitantly or selectively to identify the causes of flood risk outside one's remit for action. Future research would study in detail the relative

importance of the different perceptions of causes of flooding in order to understand how action to address chronic flood risk can contribute to improving city level sanitation.

Secondly, further research is needed to disaggregate findings about neighbourhood level youth CBOs and assess the benefits and opportunities that these types of organisations bring for young women and young men. My research showed that activities undertaken by neighbourhood youth groups remain gendered (e.g. in relation to remuneration or choice of technology). Some positive gender outcomes of youth-led CB-DRR projects relate to local level safety which benefits children, young men and young women alike, although women are much more vocal about the issue. The need to connect low-income neighbourhoods to the many public transport service networks is also high on the agenda of young girls, but their possible interlocutors are distant politicians and business cliques. For the moment, opportunities for self-realisation are more likely to benefit the male members of CBOs, primarily because many of their interlocutors are senior men in positions of power. Nevertheless, some youth CBOs started to modify their organisational principles, reflecting a broader consciousness and an ambition among the younger generation to provide equitable opportunities for female and male members. For young women, this may represent a change compared to the older generation. Gender literature and some of my data from Pikine indicate that in the relatively recent past, a condition for women with aspirations to intervene in the public domain or with leadership ambitions was first to fulfil their caring role in the family's life cycle. Only later in life, benefitting from the social status conferred to mothers, were they able to fully engage in community development work. Future research would look at detailed empirical evidence to qualify and quantify the extent to which youth-led CB-DRR benefits young women in ways which are different to their male peers and their elders.

APPENDICES

Appendix 1: list of data sources referenced in the text

Data referencing is abbreviated in the following way: Interview = Int.; discussion = Inf.int; focus group discussion = FGD; transect walk = walk; participant observation = Part. Obs.

1	Consultation of NGO internal documents, Dakar 25 June 2016
2	FGD with female residents and community volunteers, visit to five water-affected properties guided by residents, DSM, 27 June 2014
3	FGD with resident women and girls, GRN 11 July 2014
4	Inf. int. and neighbourhood visit with com. flood response volunteer/com. health worker, DSM, 12 June 2014
5	Inf. int. and site visit with volunteer teachers at community school, DSM, 24 June 2014
6	Inf. int. and transect walk with NGO water infrastructure specialist, DSM, 22 April 2015
7	Inf. int. and neighbourhood visit with two resident/community volunteer, GRN 30 June 2014
8	Inf. int. and project site visit with a délégué de quartier and an NGO staff member, DSM 16 June 2014
9	Inf. int. with local resident, GRN 04 September 2014
10	Inf. int. with local residents/members of CBO executive committee, 08 February 2016
11	Inf. int. with resident/community volunteer, GRN, 07 July 2014
12	Inf. int. with a long-term resident/CBO secretary general/deputy délégué de quartier, DSM 26 September 2014
13	Inf. int. with CBO members during a strategic meeting of the organisation, DSM 24 September 2014
14	Inf. int. with gen. secretary of Comité Local de Gestion des Inondations/Comité de Coordinationpour le Développement de Guinaw Rail, GRN 12 October 2014
15	Inf. int. with local resident and president of the women's network of DSM, DSM 15 July 2014
16	Inf. int. with local resident and president of the women's network of DSM, DSM 12 September 2014
17	Inf. int. with local resident/ délégué de quartier/president of a 'GIE de restructuration', DSM 02 December 2014
18	Inf. int. with local resident/CBO member, GRN 19 December 2014
19	Inf. int. with NGO senior staff member, DSM 11 November 2014

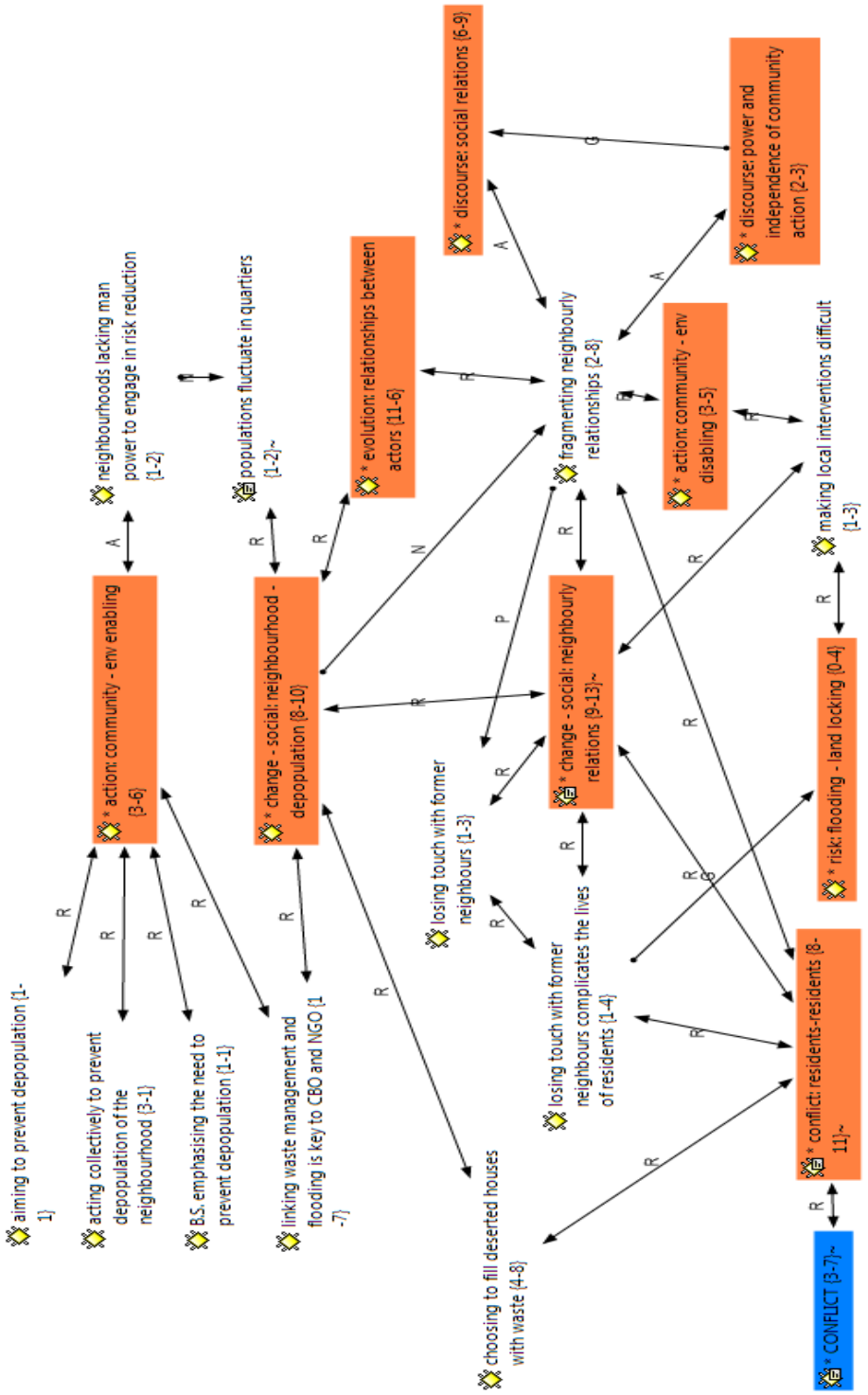
20	Inf. int. with NGO staff members working on community flood management, DSM 16 February 2016
21	Inf. int. with NGO worker during an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 25 April 2015
22	Inf. int. with president and secretary general of Comité Local de Gestion des Inondations, GRN 09 September 2014
23	Inf. int. with president of the Comité de Coordination pour le Développement de Guinaw Rail, GRN 12 October 2014
24	Inf. int. with seven délégués de quartier, DSM 07 March 2016
25	Inf. int. with the president of the Women's Network of GRNGRN, GRN 13 October 2014
26	Inf. int. with two youth CBO members, DSM 27 November 2014
27	Inf. int. with youth CBO member, DSM 19 November 2014
28	Inf. int. with youth leaders and NGO staff after meeting with local gov. representatives, DSM 03 December 2014
29	Informal Inf. int. with the president of a youth CBO during an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24 April 2015
30	Int. with NGO senior staff member, DSM 09 July 2012
31	Int. with NGO senior staff member/urban development and infrastructure specialist, 26 September 2014
32	Int. with NGO staff member, Dakar 04 September 2014
33	Int. with NGO staff member, Dakar 07 February 2016
34	Int. with NGO staff, urban dev. and decentralised drainage infrastructure, project site visit at DSM, 20 June 2014
35	Int. with project manager/engineer at SINCO SA., Dakar 11 November 2014
36	Int. with senior NGO staff member, resp. for com. support on behalf of APIX and ADM, Dakar 17 October 2014
37	Int. with senior project technical manager at Agence de Developpement Municipal (ADM), Dakar 11 June 2012
38	Int. with two senior staff members and upgrading experts, Fondation Droit a la Ville, Dakar 03 December 2014
39	Int. with urban planner and dev. specialist at the Institut Africain de Gestion Urbaine, Dakar 23 December 2014

40	Int. with urban planner, APIX restructuration urbaine Pikine Irregulier Sud, Dakar 15 March 2016
41	Neighbourhood and project site visit with a délégué de quartier and an NGO staff member, DSM 20 June 2014
42	Neighbourhood and project site visit with NGO staff and two délégués de quartier, DSM 10 July 2014
43	Neighbourhood transect walk with youth CBO members, DSM 02 January 2015
44	Neighbourhood visit, Wahkinane Nimzatt, 3 July 2012
45	Part. Obs. at NGO gender training workshop (D1) and focus group discussion, Keur Massar, 12 November 2014
46	Part. Obs. at NGO gender training workshop (D2) and focus group discussion, DSM, 13 November 2014
47	Particip. obs. at a briefing by the Dakar office of the European Commission, Dakar, 17 February 2016
48	Particip. obs. at a major neighbourhood cleaning action (Set Setal), DSM 21 December 2014
49	Particip. obs. at a project proposal writing workshop with two local NGOs working on participatory planning and urban youth governance, Dakar, 22 February 2016
50	Particip. obs. at a regular meeting of project partners (CBO, NGOs, délégués de quartier, LG rep), DSM 16 April 2015
51	Particip. obs. at a youth association's annual general assembly, DSM 30 November 2014
52	Particip. obs. at an NGO training on data collection, DSM 31 December 2014
53	Particip. obs. at an NGO-led mid-term evaluation with youth CBOs working on neighbourhood development, Pikine 25 April 2015
54	Particip. obs. at an NGO-led mid-term evaluation workshop with youth CBOs working on neighbourhood development, Pikine 24 April 2015
55	Particip. obs. at an NGO-led training session focussed on development of community project proposals by youth CBOs, DSM 18 September 2014
56	Particip. obs. at NGO gender training workshop (D3), DSM 14 November 2014
57	Particip. obs. Inf. int. and site visit during an internal regional workshop of an INGO, Dakar 22 April 2015
58	Particip. obs. of project partners meeting at with local gov. representatives, DSM 03 December 2014
59	Project meeting with local CBOs and partner NGO during preliminary fieldwork, DSM 03 July 2012

60	Project site visit with a délégué de quartier and an NGO staff member, DSM 16 June 2014
61	Site visit with general secretary of Comité Local de Gestion des Inondations/Comité de Coordination pour le Développement de Guinaw Rail, GRN 15 October 2014
62	Stakeholder Interviews during mid-term evaluation of an NGO intervention in the context of a national programme Integrated Management of Coastal Zones (Projet de gestion des zones côtières du Sénégal - GIZC), Dakar-Mbour, 01 August 2014
63	Strategic meeting attended by CBO, NGO and délégué de quartier, DSM 21 November 2014
64	Transcript - FGD with female residents and community volunteers in the context of evaluation of a community project (unattended, transcript used as data), DSM, 05 January 2015
65	Transcript of a FGD with local residents/members of CBO executive committee, DSM 08 February 2016
66	Transect walk with CBO general secretary and Inf. int. with CBO president, Diamaguene Sicap Mbao, 22 September 2014
67	Walk and inf. Int with Youth CBO executive member/community development agent, DSM 07 March 2016
68	Written communication with NGO staff member, Dakar 13 July 2016

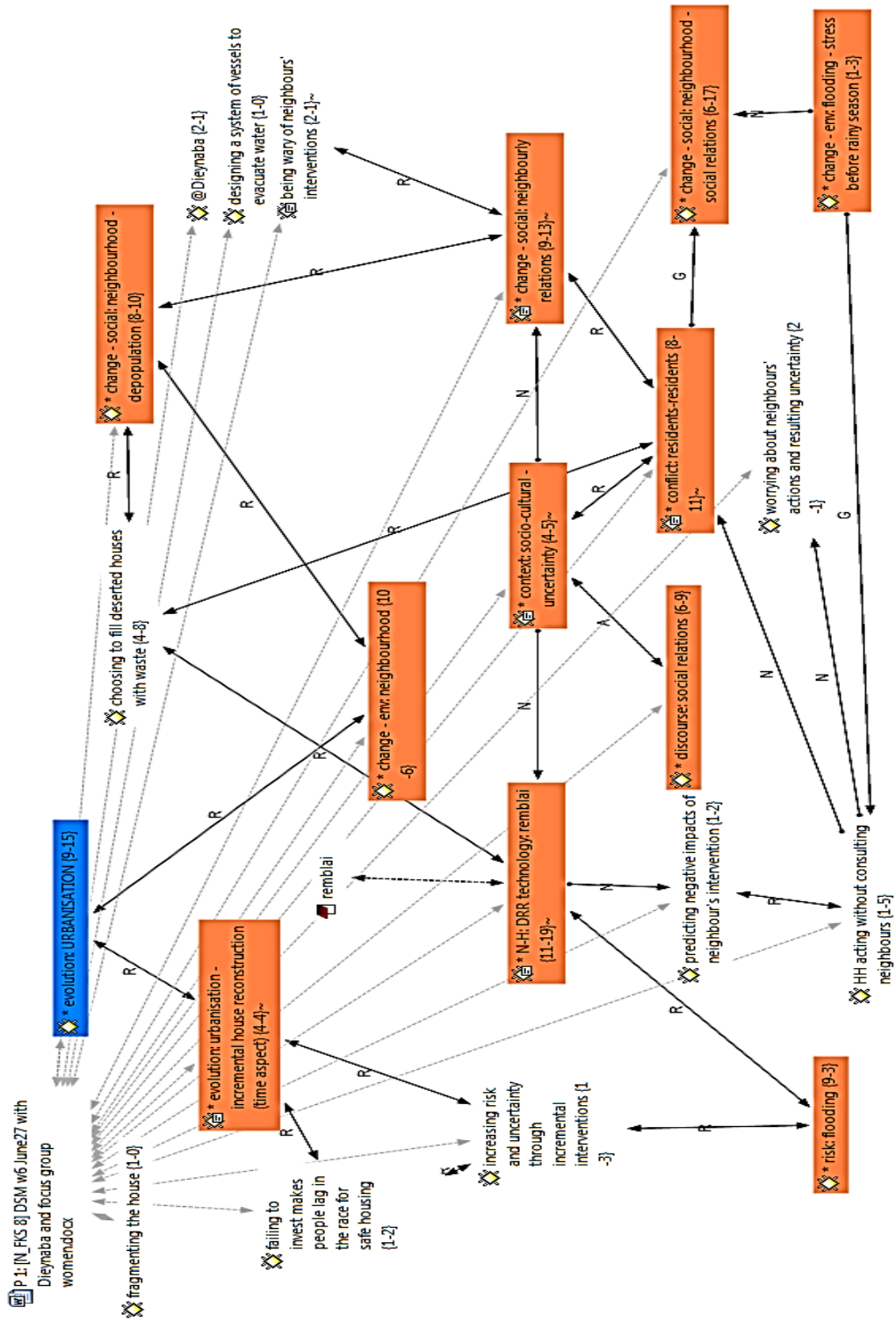
Appendix 2: data analysis - mapping depopulation

Example of a code diagram developed to analyse the social impact of depopulation and local residents' responses to this phenomenon.



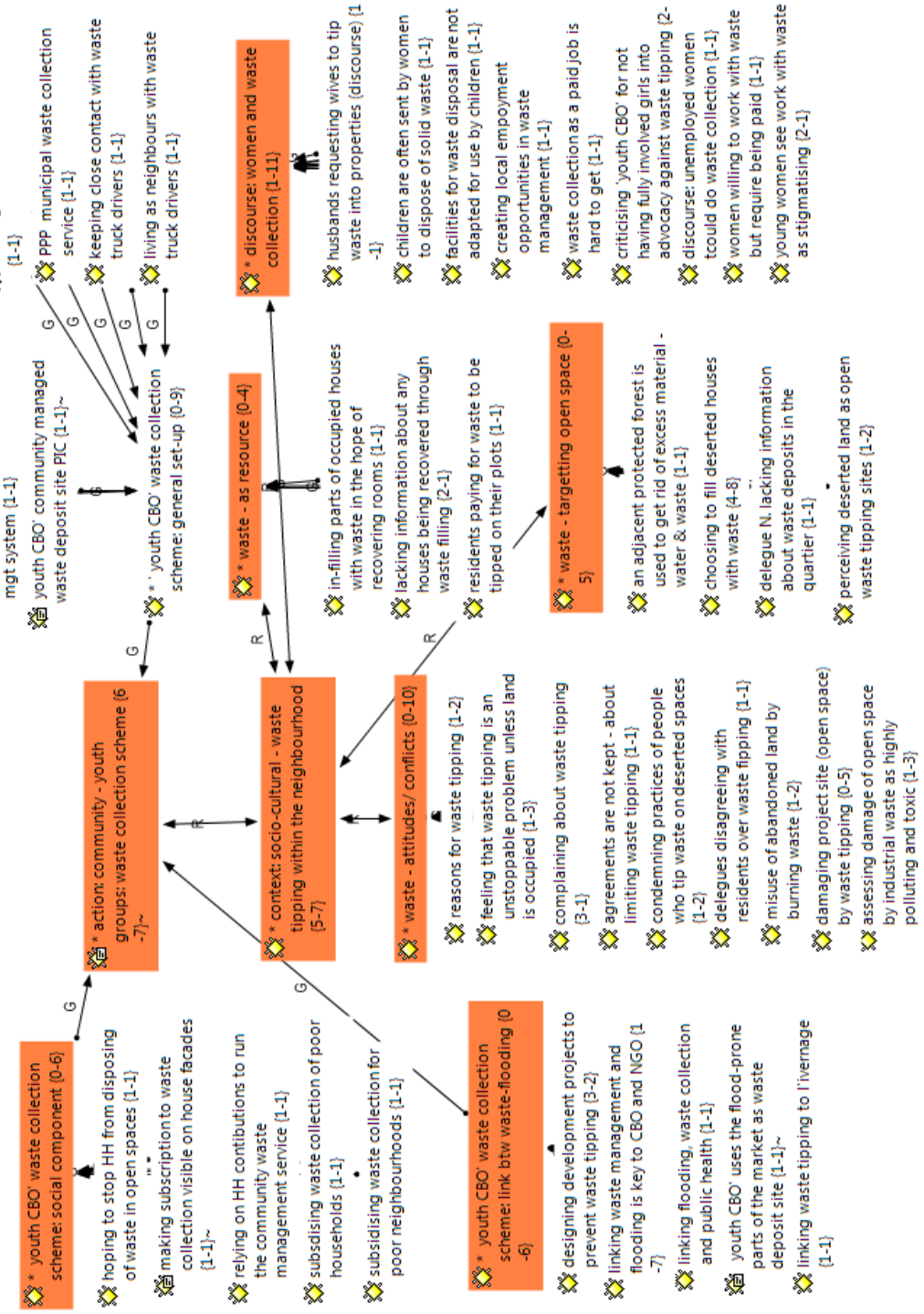
Appendix 3: data analysis - mapping remblai and uncertainty

Example of a code diagram combining primary and secondary codes when analysing the relationship between *remblai* and neighbourhood relations.



Appendix 4: data analysis - mapping solid waste

Example of code diagram used to assemble evidence by ordering primary codes.



Appendix 5: additional questions to guide data collection

The following questions were used to guide the early stages of data collection.

How have local organisations and networks involved in CB-DRR evolved since flooding became a recurrent hazard?

Trace a detailed history of structural CB-DRR interventions over the past 20 years. At which points did different actors join in/drop out of CB-DRR projects? Have there been changes in leadership within these initiatives? Have the interventions been publically challenged? How do contemporary community-organisations relate to the city's socio-political history?

How are different actors involved in the production of community-level risk reducing interventions?

How is the timing and focus of the intervention decided? Who feels entitled to the benefits brought about by the interventions? Who gains access to resources as a result of these interventions (e.g. compensation/ remuneration in the form of income, land, other valuable resources)?

Address three core structural elements of power (Batliwala, 2008):

- ideologies that justify and sustain inequality (i.e., the beliefs, attitudes, and practices that are designed to uphold social hierarchies)

- ways in which resources are distributed and controlled (material, financial, human, and intellectual): the distribution and control of resources (Who gets what); division of labour (Who does what); decision-making power (who decides what); the power to determine whose issues / priorities come to the table for discussion (Who sets the agenda)

- institutions and systems that reproduce unequal power relations – the family, community, state, market, education, health, law, etc.

How are unequal social relations power spatialised and formalised through CB interventions?

Understand how the benefits and risks associated with community drainage networks map onto the local demographics (income, ethnicity, community role, duration of occupation, housing type, infrastructure provision, tenure, etc.).

How are CB-DRR interventions accommodated within formal process of 'local development planning' mandated to local government?

What are the benefits of CB-DRR to women?

How have women's burdens and benefits changed over the past 15-20 years? And how does CB-DRR contribute to these burdens? How do the interventions change the timing, duration, intensity of flooding? How do women assess the effectiveness of CB-DRR interventions?

Assessment of impact on gendered responsibilities: time, costs/expenditure, security. Assessment of opportunity costs -of involvement in decision-making (time), contributions (financial, time/labour) to construction and maintenance?

Assessment of productive activities which are linked to these interventions and their costs/benefits to different actors: e.g. urban gardening, cloth dyeing, street sales.

Unintended outcomes

What are women's motivations and rationales for engagement in CB-DRR?

How do CB-DRR interventions provide an opportunity for community actors to leverage wider institutional support for risk reduction?

Examine formal programmes beyond the neighbourhood such as provision of basic infrastructure, upgrading and land-titling programmes or formal resettlement projects.

Appendix 6: data analysis – selection of principal 2nd round codes

* action: community (sub categories: disabling environment / enabling environment / women's groups /
youth groups (with further sub categories)
* actors - (sub categories: households / youth CBOs/ women's CBOs/ neighbourhoods authorities / state bodies / LG / donors / personal characteristics)
* Non-human: DRR technology (sub categories: comm drainage / comm open drainage / *forages* / pumping / remblai (dislocating risk) / sanitation-sewage / symbolic aspects /underground drainage / unintended impacts / *vidange* / water retention basins)
* change - env (sub categories: flooding / neighbourhood - open water & spatial change)
* change – social (sub categories: dislocation / migration / loss of trust)
* change – social-neighbourhood (sub categories : depopulation ; social relations ; neighbourly relations
* conflict (sub categories: authorities-civil society ; authorities-residents ; NGO – residents ; residents-residents ; management of conflict)
* context: political (sub categories: accountability / legislation / manifestations of power / municipal politics & elections / policy)
* context: socio-cultural (sub categories: information flow / uncertainty / waste tipping within the neighbourhood)
* discourse (sub categories: apolitical nature of comm agents / env-health risk / gender relations-roles / identity / intergenerational differences / lack of youth spaces / power and independence of community action / social relations / women and waste collection)
* evolution: DRR interventions
* evolution: thinking about CB-DRR
* evolution: org dev (sub categories: data collection and ownership ; formalising ; history ; membership ; networking)
*evolution: new youth CBOs (sub categories: financing/procedures/organisational structure/training
*evolution: relationships between actors)
* evolution: urbanisation (sub categories: characteristics of neighbourhoods / construction / history of housing policies & attitudes / incremental house reconstruction (time)/ layering of interventions / peri-urban areas / restructuration / regularisation / urbanisation - *Set Setal*)
* financing (sub categories: DRR financing / financing development / *tontines* / women & financing
* restructuration – highway / procedures – methodology / meaning – definition / resettlement zones
* risk: env/health – water / waste (waste - as a resource ; attitudes/ conflicts ; targetting open space)
* risk: flooding (sub categories: investment / land locking)
* risk: safety
* roles: gender roles / income generation / intergenerational / ambitions and motivations

Appendix 7: Table of Contents - Expanded

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