"We've got to address the underlying causes"

A case-study of stakeholders´ initiatives to increase resilience to flood risk in Sweet Home informal settlement, Cape Town

Picture taken during a representation of the awareness raising play 'Spirit of Water', also shown in Sweet Home informal settlement. Source: Jungle Theatre Company 2011

Isabelle Desportes – 6026834 – isabelle.desportes@laposte.net

Thesis supervisor: Dr. Michaela Hordijk, University of Amsterdam

Local supervisor: Joy Waddell, University of Cape Town

Second reader: Dr. Maarten Bavinck, University of Amsterdam

Acknowledgements

Title quote: from a City of Cape Town official working in the Disaster Risk Management Centre (2013)

Figures and tables

Table of Contents

Acronyms

CCT	City of Cape Town
CSO	Civil Society Organization
DiMP	Disaster Mitigation for Sustainable Livelihoods Programme
DRMC	Disaster Risk Management Centre (City of Cape Town department)
DRR	Disaster Risk Reduction
EPWP	Extended Public Works Program
FliCCR	Flooding in Cape Town under Climate Risk (project based at the African Centre for Cities)
GIS	Geographical Information System
TRS	Transport, Roads and Stormwater (City of Cape Town department)
UNISDR	United Nations International Strategy for Disaster Risk Reduction

Introduction

Some scholars argue that we have entered a new geological epoch, an era of change in which humankind plays the lead role: the Anthropocene. A prominent example is Nobel-prize winning chemist Crutzen (2006, p. 13), who asserts that "human activities are exerting increasing impacts on the environment at all scales, in many ways outcompeting natural processes". 'Environmental change', 'climate change' and 'global change' denote ecosystem modifications we have increasingly witnessed over the last years, from the local up to the global level, and which can mainly be traced back to anthropogenic sources, such as enormous rates of urbanization and green-house gas emissions (*Intergovernmental Panel on Climate Change* 2007). However, societies are far from controlling the effect they have on the environment. As visible on the graph below (cf. fig. 1), the occurrence of hydro-meteorological disasters, such as typhoons, droughts, tsunamis and floods, has increased over the last decades.
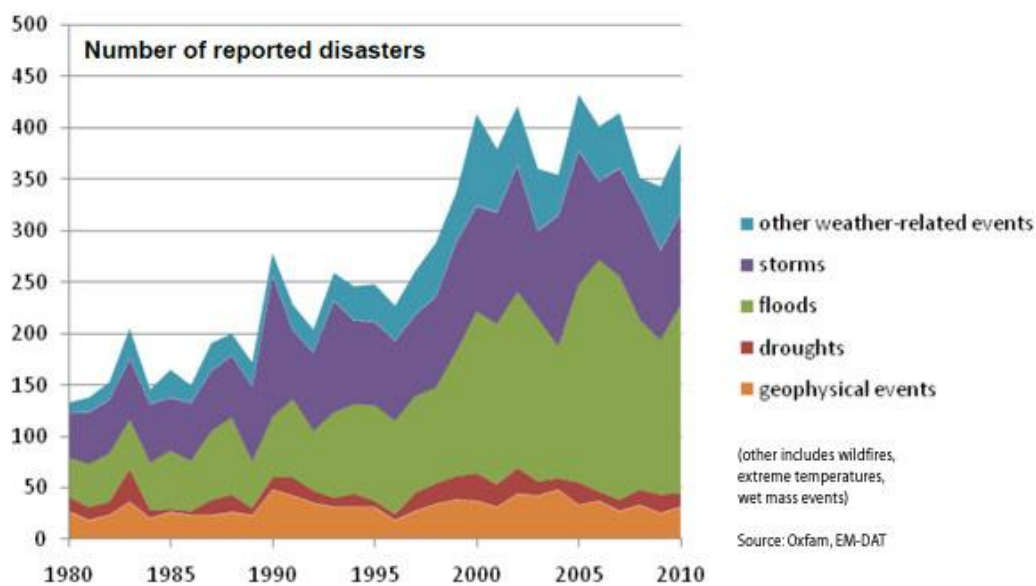
Figure 1: Reported disasters around the world since the 1980s. Source: Jennings 2011, based on EM-DAT[1]

Climate change and climate variability are likely to further support this trend, with extreme weather events growing in amount and in scope, and impacting developing countries in particular (Thomalla et al. 2006). Development endeavours then have to take into account these factors as well, adjusting "bio-physical, social and/or economic systems" not only to improve the lives of their inhabitants, but also to respond to "actual or expected climatic impact and its effect" (Mukheibir and Ziervogel 2006, p.2).

---

[1] EM-DAT is a global disaster database maintained by the Center for Research on Epidemiology of Disasters (2009), which defines a 'disaster' has to fulfill at least one of the following criteria: "Ten (10) or more people reported killed; Hundred (100) or more people reported affected; Declaration of a state of emergency; Call for international assistance".

The 'Flooding in Cape Town under Climate Risk' (FliCCR) project, based at the *African Centre for Cities* and funded by Canada's *International Development Research Centre* and the United Kingdom's *Department for International Development* from 2010 until 2013, aimed to understand and strengthen exactly such risk governance and adaptation processes in Cape Town, South Africa. The need for the endeavor was acute, as an estimated 88,000 households living in the area called the Cape Flats are annually impacted by flooding (Disaster Risk Management Centre 2009), posing a major challenge to the City of Cape Town (CCT) municipality. The present thesis contributes to the FliCCR project through a case-study of one vulnerable community situated in the Cape Flats, in Sweet Home informal settlement. The aim is to capture the present initiatives undertaken by stakeholders - residents, CCT, civil society organizations (CSOs), academia – to increase resilience to flooding in a context where vulnerabilities are high, and assess and explain to which extent their efforts are crowned by success.

This research topic is relevant, for society and for the academic field related to questions of resilience and environmental risk, but possibly also beyond. It is socially relevant at different levels, first and foremost at the level which constitutes the unit of analysis: the community of Sweet Home, including all the stakeholders involved in increasing its resilience to flood risk. On a scholarly level, resilience is a common subject within the current context of rapid and profound environmental change. It is increasingly recognized that humans should not aim for the impossible, i.e. dominate or control natural forces, but live with them. Efforts must be directed towards strengthening communities' capacity to cope and adapt to the unexpected. Yet, Canon and Müller-Mahn (2010, p. 627) deplore the dominance of natural sciences when discussing issues of resilience, as well as the lack of literature exploring the linkages between resilience and vulnerability. On a similar note, Lopez-Marrero and Tschakert (2011, p. 247) stress that "there is an urgent need for more case studies at the local level that address multi-faceted drivers and distil key characteristics of resilience to hazards". Currently, literature pertaining to resilience remains at a fairly abstract level, for instance listing broad characteristics for resilient communities, but rarely going into practicalities or operationalization (Bahadur et al. 2010). Hopefully, this thesis can be a modest contribution in filling this gap.

After detailing the theoretical framework, research context and methodology, empirical findings are presented in three steps. First, the focus is on the community of Sweet Home, paying particular attention to the underlying causes of the community's vulnerability to flooding, and how residents engage in initiatives to increase their resilience to the hazard. We then step back to study the flood governance system at large. The second empirical chapter details the initiatives of the CCT and CSOs to strengthen resilience in Sweet Home, and to which extent those are deemed successful by all stakeholders, especially residents.

The third empirical chapter takes on a more long-term and explanatory view, looking at adaptation processes and how academia can be of support to strengthen them. The final conclusions summarize the findings, both empirical and theoretical.

Theoretical framework: Resilience

First of all, let us clarify how risk, vulnerability, resilience and adaptation are conceptualized in the present case-study – an important task, since the semantic field relating to disasters and resilience is wide and complex, with a multitude of homonyms, (quasi-) synonyms and frequently unstable use of terms. Theoretical additions will be made as we progress in our research endeavor, providing specific frameworks guiding the analysis within each empirical chapter, and enriched with insights from preliminary conclusions.

The social co-construction of risk

According to Füssel (2007), theoretical work pertaining to risk can be divided in two broad strands: those posing vulnerability as the starting-point, and those setting it as the end-condition.[2] We ally ourselves to the former viewpoint, which is mainly advanced by scholars of political economy. The vulnerability of the inhabitants of developing countries' urban centers is at the root of the problem, as much as hydro-meteorological hazards and long-term climatic trends. The denotation 'natural' only refers to one necessary but not sufficient cause of the resulting risk, and should certainly not be understood in the sense of 'unavoidable'. A disaster is the outcome of a hazard effectively striking a vulnerable community. For example, the problem is not so much the occurrence of an earthquake, but also that housing is not built to absorb seismic vibrations. We call this social component of risk 'socioeconomic vulnerability', complementing 'biophysical vulnerability' (Füssel 2007).

It follows that disasters are socially co-constructed events, they are "the product of the impact of a natural hazard on people whose vulnerability has been created by social, economic and political conditions" (Cannon and Müller-Mahn 2010, p. 622). As a corollary of this point, human societies can act to prevent the occurrence of disasters, and mitigate their impacts. Renn (2008, p. 1) points out that the term 'risk' would make no sense if "the future were either predetermined or independent of today's human activities". Contingency, between possible and occurring environmental events, as well as between possible and chosen paths of action to proactively or reactively deal with these events, is at the heart of the subject. Agency, by studying initiatives knowingly developed and implemented by various stakeholders, thus forms an important object of our research, even if broader structural factors (e.g. institutionalized governance systems) have a large influence on the degree of agency which can be exerted (Smit and Wandel 2006; Mosse 2010).

---

[2] The latter is part of the realist approach which views hazards first as increasing vulnerability.

The shift towards resilience thinking

Second to acknowledging that risks can be governed and not only passively suffered comes the question of the aim risk management should pursue. While before, the main goal was to resist change, 'resilience' is now the aim broadly recognized in the Disaster Risk Reduction (DRR) discourse (Adger 2000; Bahadur et al. 2010). The adoption of the concept in the The Hyogo Framework for Action 2005–2015 of the *United Nations International Strategy for Disaster Risk Reduction* (UNISDR) (2005) formed an important milestone.

Various factors have led to the establishment of resilience within the DRR discourse, and make a strong point for the relevance of a 'resilience approach'. First, the recognition that risk is not all objectively recognizable. A constructivist approach to risk now exists in parallel to a realist approach, acknowledging that risk does not only occur in the outside world, but foremost within people's (selective) minds, depending on their own experiences and histories (Slovic 1992; Renn 2008). Second, "rather than seeing the world as orderly, mechanical and reasonably predicable, [scientists] see it as chaotic, complex, uncertain, and unpredictable", and recognize that sudden "regime shifts are not necessarily the outcome of an external disturbance and its linear and proportional cause and effects" (Davoudi 2012, p. 302). This links up to the broader paradigm shift accompanying resilience thinking, from hierarchy towards panarchy, acknowledging non-circular processes within coupled socio-ecological systems, across space and across time (Davoudi 2012; Leach 2008, p. 2). Such systems are highly unpredictable, it is therefore very difficult to resist by preparing for the most likely scenario.

In response, a resilience approach shifts its focus from reducing external threats towards strengthening the system itself (Manyena 2006, p. 435). The focus becomes more localized, questioning the resources at disposition of a system to prevent and respond to shocks and stresses, its capacity to deal with change so that it does not get completely overthrown by it (Lopez-Marrero and Tschakert 2001, p. 229). One needs to determine how this capacity can be strengthened proactively, and who is best placed to do so. This translates in practice to advocating a holistic and human-centered instead of a technical approach (Manyena 2006). While 'hard sciences' play the lead role when the acknowledged goal is to resist change and dominate nature, the resilience approach sees complementary initiatives, tackling various root causes for risk, at various levels, as necessary. Risk management is then not a centralized and technical, but a cross-cutting issue (Hardoy et al. 2011). For instance, it is not only important to build a dyke to control water inflows, but also to increase the awareness of residents so that they know how to act in case the dyke breaks.

Disentangling resilience and adaptation

On the one hand, resilience is an entire approach, a discourse, a way of thinking which is not neutral but rather ideologically and politically-laden (Shaw 2012). But 'resilient' is also an adjective used to characterize a socio-ecological system, often used interchangeably with the expression 'capable of coping'. A major debate within the resilience literature is whether resilience should be seen as an outcome or as a process, whether stability or dynamism should be central to a 'resilient' system (Manyena 2006; Carpenter et al. 2001, p. 766). We resolve the issue as follows. Resilience is an outcome, a present state of a socio-ecological system. Yet, it is a state of flexibility (Norris et al. 2008, p. 130). Reorganization can take place within that system, so that it can "still retain essentially the same function, structure and feedbacks, and therefore identity" (Folke et al. 2010, p. 22). This definition, referring to the "capacity to change in order to maintain the same identity" might seem contradictory at first. The rationale behind it does however become clear when the concept is contrasted to that of 'adaptive capacity'.

Adaptive capacity refers to the capacity of a system to adapt, i.e. "change the set of available inputs that determine the coping capacity" (Yohe and Tohe 2002, cited in Pelling 2011 p. 36). Change is the critical word within this definition. Indeed, a system is resilient if its present institutions, structure and functions enable it to cope, for instance pro-actively setting up an effective drainage system or reactively mobilizing the entire community to repair the most impacted housing structures. On the other hand, adaptive capacity is the basis on which to reach a resilient state. "The set of available inputs", that is essential attributes (Manyena 2006, p. 439), is modified when adapting, and the time span of adapting is larger than the frame of coping (Füssel 2007). Drawing again on the two above examples, the drainage system cannot be implemented if the community cannot rely on public bodies to fund the materials and provide the manpower and knowledge. Similarly, the success of the housing reparation initiative depends on the strength of social ties within the neighborhood. A community is thus resilient if it does not need to adjust, that is overthrow or further develop, its core structures (e.g. community solidarity) and functioning (e.g. relationship with the municipality) to have the capacity to cope with environmental risk. Resilience being the end-goal, adaptation initiatives are also counted as indirectly leading to resilience. Even if resilience is here defined as a state, one can still talk of degrees of 'increased resilience', be it only because there are no objective indicators which could lead to the recognition that a system just passed the threshold from non-resilience to resilience.

One last note should be made concerning the issue of relocation. Theoretically, relocation cannot be framed as an initiative increasing resilience, as it means leaving the system which constitutes the unit of analysis. It is rather linked to 'transformability', defined as "the capacity to create a fundamentally new system when ecological, economic, or social

structures make the existing system untenable" (Walker et al. 2004, p. 5). However, relocation being an important issue in Sweet Home, we will pay attention to it in our analysis as well.

Research context: Cape Town's flood prone informal settlements

Context is always primordial, and especially so in South Africa, where the country's violent past looms behind many actions and statements made today. From a historical perspective, the high economic inequality presently characterizing the country is the triple result of oppressive phases: colonialism, segregation, and the political project of apartheid, or legalized racial discrimination. The latter was implemented from the access of the National Party to power in 1948, and officially ended with the country's first democratic elections in 1994 (Zuern 2011, p. 7). Not the sole yet an important champion in the fight for freedom and democracy, the African National Congress (ANC) has since then achieved overwhelming victories at national, provincial and local level. Today, this results in South Africa often being referred to as a "dominant-party democracy", with the danger of "reduced checks on the power of the winner and fewer opportunities for opposing ideas, arguments and policies" (Zuern 2011, p. 140). The promise of 'jobs and houses for all' made by the government in 1994 and partly enshrined in the Constitution[3] (Republic of South Africa 1997) is largely unfulfilled. Today, approximately 13.6% of South Africans live in informal settlements (Statistics South Africa 2011a, p. 63). Issues of class have largely replaced issues of race, as "neoliberal restructuring has led to widening inequality and very high rates of unemployment" in the country (Ferguson 2010, p. 175). Still, the overlap between population groups and classes is undeniable. According to the 2011 Census (Statistics South Africa 2011a, p.52), the expanded unemployment rate within the black African population group, which makes up 78.2% of the working age population, is of 46.3%. In comparison, the expanded unemployment rate for the white population group is of 10.2 %.

A local government dealing with high urbanization and poverty rates

With its estimated 3,740,026 inhabitants, Cape Town is South Africa's second largest city (cf. fig.2). It is moreover the legislative capital of the country, and the economic and administrative center of South Africa's second wealthiest province, the Western Cape (Statistics South Africa, 2011b). As such, it constitutes a magnet for many immigrants in search of a better life, mainly coming from the Eastern Cape, but also from other African countries (Statistics South Africa 2011a, p.26).

---

[3] "The housing legislation commit the government to ensuring that all South African citizens are given access to adequate housing, even if this is on a 'progressive' basis" (Napier and Rubin 2002, p.8). The same holds true for the provision of basic services and access to water.

Figure 2: Location of the Western Cape Province and of the City of Cape Town in South Africa. Source: FliCCR 2013

Confronted to massive rates of in-migration, the CCT faces a major housing and services backlog when trying to accommodate the needs of "people who cannot afford to access housing in the formal market" and thus end up in "unplanned and unauthorized residential areas", also known as informal settlements (Huchzemeyer 2010, p. 129-130; Swilling 2010, p. 195). According to the latest informal dwelling count carried out by the CCT (2008), an estimated 108,899 shacks were located within the municipality's boundaries in 2007, most of them concentrated in an area called the Cape Flats, southeast of Cape Town's central business district (approximate delimitation on the map below). 400,000 families are currently on the municipal waiting list for housing, which equates to about 1.6 million people, or about half of Cape Town's current population (councilor 2013[4]). This complies with general socioeconomic indicators: 50% of Cape Town's population has been classified as poor (Swillig 2010, p. 195).

In the words of an interviewed CCT official from the Water and Sanitation department (2013):

> "The city is always thinking 20 years in advance in their plans. And they've done it for many years. What I've said the whole thing, is the fact that the city's now flooded with all these informal settlements. And that has put us 30 years back."

---

[4] Quotes followed by ('name of CCT department' official 2013), ('name', Sweet Home resident 2013), (member of 'name of the CSO' 2013) and ('party affiliation' councilor 2013) are taken out of interviews conducted by the author.
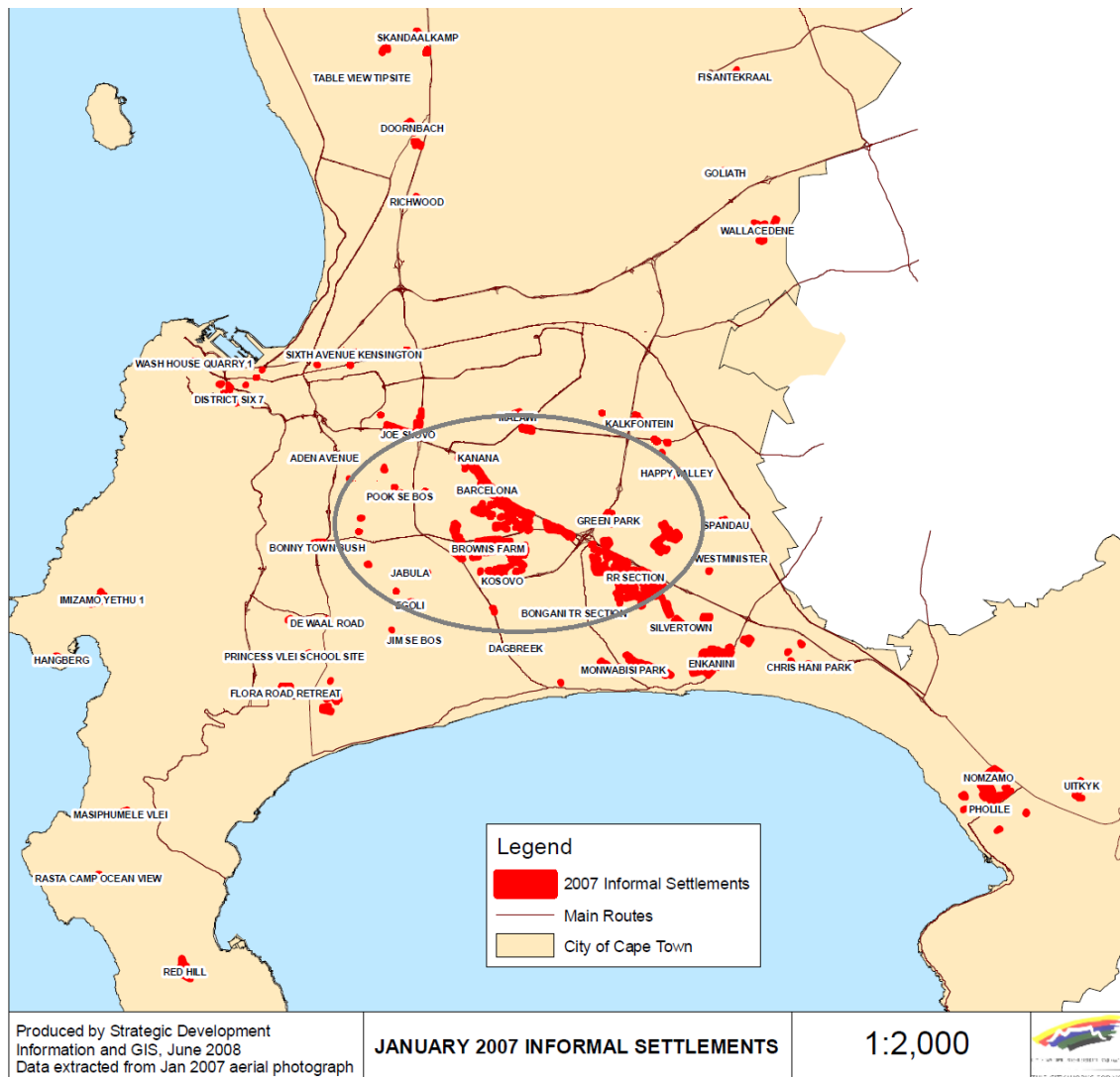
Figure 3: Informal settlements in Cape Town, with an approximate delimitation of the Cape Flats in grey. Source: CCT 2008

In South Africa, a variety of external factors impact on local governments' ability to manage informal settlements and related development issues. Graham (2006, p. 232) highlights key social, economic and political factors constraining state intervention in urban settlements, namely "institutional structures, capacity constraints, financing mechanisms, international relations and social dynamics within which local government has to operate."

One of these institutional structures is the ward system, proposed by the Local Municipal Structures Act in 1998, and implemented in Cape Town in 2000. Ward committees are supposed to serve as main channel through which residents and their local government can agree on policies and allocate resources so as to effectively address residents' needs (Zuern 2011, p. 142). In Cape Town, this translates into 111 community staffed ward committees, each one chaired by a locally elected ward councilor affiliated to a political party, but also

comprising a Proportional Representative councilor[5] (PR councilor). All councilors (ward and PR councilors), constitute council, which is the executive and legislative body responsible for governing Cape Town (CCT 2011). Currently, the Democratic Alliance (DA, the main opposition party to the ANC) forms the major party within council, and elected Executive Mayor Patricia de Lille. Additionally, sub-councils, which are aggregates of wards, make recommendations to council or other specialized CCT committees. Departments grouped into 13 directorates (in orange on fig. 4) constitute the administrative realm of the CCT. The latter implements the policies decided on by the political realm.
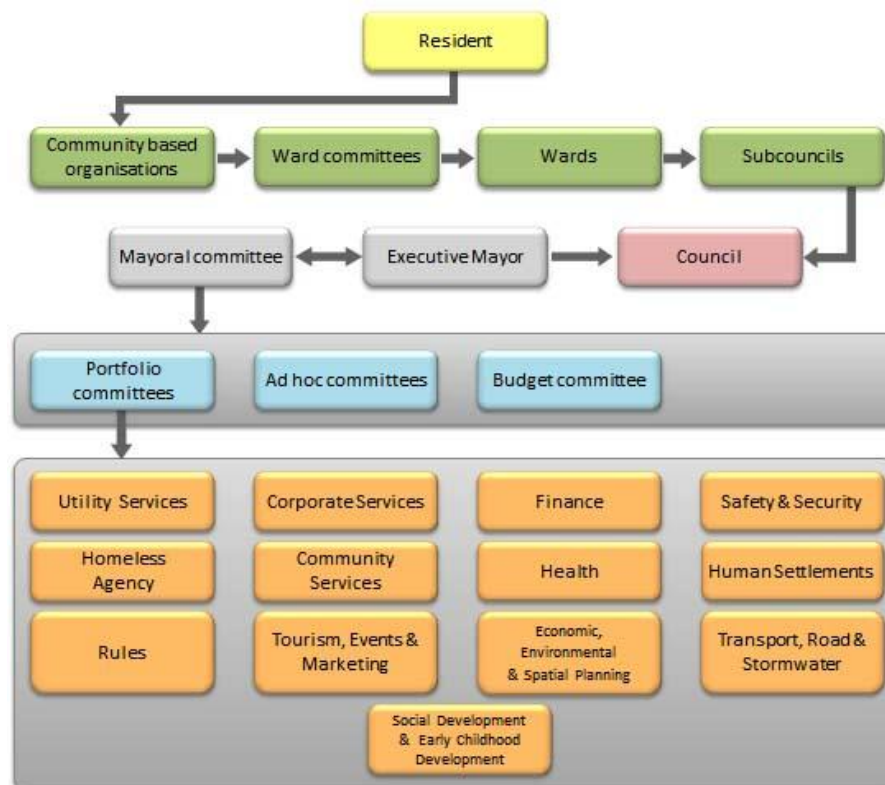
Figure 4: CCT institutions. Source: CCT 2013a

What is not reflected on the above scheme is an entire system of informal leadership structures subsisting in many of Cape Town's informal settlements. These structures vary from settlement to settlement, but are essentially characterized by fluidity, fragility and fragmentation. They are tasked with settling internal matters, lately also for regulating government or CSO involvement (Skuse and Cousins 2007; FliCCR 2013, p. 3[6]). This is not always welcomed by CCT officials themselves:

---

[5] Proportional representatives are deployed by political parties following their strength – South African dispose of two votes at local government elections, once for their ward, once for a party within Council (Coucillor 2013).
[6] Insights from ongoing PhD research on 'Internal Politics and Organizing in Informal Settlements' conducted by Laura Drivdal.

"This thing of leaders also gets to our nerves. These self-appointed leaders […] The ward councilor, here's our link to that community" (DRMC official 2013).

Dissatisfaction and tensions between informal settlement residents and local government were particularly salient during the fieldwork period, one year before national general elections. Protest actions such as demonstrations in Cape Town's central business district, blockages of major highways and vandalism towards city infrastructure took up in frequency and intensity. These can be fights for socioeconomic (access to housing and jobs) and civil rights (linked to political marginality and the belief that demands cannot be put forward through formal state institutions). However, they are also frequently framed, by interviewed councilors (2013), CCT officials (2013) as well as in official statements by Mayor de Lille (2013b), as staged events resulting from "political manipulations" to picture the CCT as a city which "does not care for its residents and is building an exclusionary society". Zuern (2011, p. 7) highlights how in South Africa, political and administrative processes are often derailed and blocked by party politics; "political" instead of "popular" decisions are made. Finger-pointing, also relying on 'racial thinking schemes', still occurs. To cite but one example illustrating the pervasiveness of racial tensions, a local informal leader was characterized by ANC supporters as "black white" for trying to engage constructively during a public meeting organized by the (DA) Mayor (Aviwe, Sweet Home resident 2013).

A local government dealing with flood risk in the Cape Flats

Being located on a mountainous peninsula with its inherent high levels of precipitation, Cape Town is highly exposed to coastal and inland flooding, strong wind-blown sands, coastal erosion and water stress (Mukheibir and Ziervogel 2006). While fires are the main hazard during summer months, floods are the main concern in winter, from May to August. Over a six week period during the winter of 2013 alone, the CCT assisted close to 160,000 flood victims and spent more than ZAR 15.9 million on flood relief efforts (CCT 2013c)[7]. This situation is likely to be further exacerbated by climate change and climate variability (CCT 2007; *Disaster Mitigation for Sustainable Livelihoods Programme* (DiMP) 2009; Ziervogel and Smit 2009). Indeed, the Western Cape is one of the two South African provinces most at risk of climate-induced warming and rainfall changes, in particular a likely higher occurrence of extreme weather events (Mukheibir and Ziervogel 2006). In Southern Africa, the *Intergovernmental Panel on Climate Change (*2007, p. 435) ranks as very high the probability of climate change and climate variability to severely impact agricultural production and food security, cause natural disasters, water stress, disturb ecosystem equilibrium and health hazards.

---

[7] 15.9 million Zuid-Afrikaans Rand (ZAR), the South African currency. ZAR10 equal approximately 1 euro.

Within Cape Town itself, the wetland area Cape Flats (cf. figure 5), constitutes an above average flood risk zone where "long periods of rainfall result in the gradual saturation of the ground and accumulation of water in poorly drained areas" (Ziervogel and Smit 2009, p. 6). This is the same area to which those not belonging to the white population group were forced to relocate as part of the *Group Areas Act* in the late 1960s (Jara 2010, cited in Sutherland et al. 2010). Following several waves of migration, mainly from the Eastern Cape, the Cape Flats now count more than 200 informal settlements, the highest concentration of informal settlements in Cape Town. 56 of these informal settlements, comprising 88,000 households, are predicted to be annually affected by flooding (Ziervogel and Smit 2009; DRMC 2009). The statement that "certain disadvantaged segments of the population, typically […] the poor, bear a disproportionate burden of environmental risk" (Mennis 2002, p. 281) thus clearly applies to Cape Town.

Figure 5: Image of Cape Town, with the Cape Flats (black box) and CBD (yellow circle). Source: Bouchard et al. 2007, p. 9

It is damage caused by the severe 1994 floods in the Cape Flats that urgently pointed to the need for a national disaster management policy, taking form in the *Green Paper* and *White Paper* on Disaster Management, and finally in the promulgation of the *Disaster Management Act, 57 of 2002* (Republic of South Africa 2005, p.1). The *Act* (Republic of South Africa 2002, p.7) describes Disaster Risk Management as "a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures". While provincial and national institutions as well as several state owned enterprises come into play, local governments are assigned the primary functional role in the implementation of the *Act*, with the compulsory establishment of Metropolitan Disaster Management Centers in each metropolitan and district municipality (Republic of South Africa 2002).

In Cape Town, this resulted in the creation of the local *Disaster Risk Management Centre* (DRMC) and in the specification of its mandate and guidelines in the *Municipal Disaster Risk*

Management Plan (DRMC 2012). An interdepartmental CCT platform chaired by DRMC, the *Flood and Storms Task Team* (henceforth referred to as the '*Task Team*') was further instituted in 2008 with the aim of reducing flood risk from the annual winter storms. It provides the structure for around 22 CCT departments to integrate preparedness and response activities based on the *Winter Preparedness Strategy* and *Flood and Storms Plan* (DRMC 2009). The strategy is updated every year, based on risk assessments commissioned by DRMC, as well as pre-winter field visits conducted by teams with members of different departments (Environmental Health official 2013).

Sweet Home informal settlement

Our analysis concentrates on the community of Sweet Home alone, the latter being defined as one grouping of households with a sense of belonging to a place and common institutions, and which is recognized by external stakeholders as one entity. The island of shacks constituting Sweet Home, located in the Cape Flats at the northern edge of ward 80, also known as Philippi, is cut off from its surroundings by major roads and the tracks of the Nyanga railroad line (cf. figure 6).

Originally farmland, then a dumping site for rubble, Sweet Home has been occupied by shack-dwellers since 1992 (Sacks 2012). Over time, the number of residents has increased drastically to approximately 17,000 people (DiMP 2009), or about 2,700 shacks in 2011, as stated in the CCT database (Water and Sanitation official 2013). Most of the community consists of Xhosa-speaking migrants from the Eastern Cape. It also counts migrants from other African countries and a small group of people belonging to the colored population group, descendants of the original farm laborers (DiMP 2009, p. 5).

Ward 80 has been described by an interviewed DA councilor (2013) as an "identified ward", fulfilling the two criteria of having an ANC ward councilor and being a very rural area with many informal settlements. The district within which ward 80 is located has a Socioeconomic Status Index[8] of 40.43, making it the second worst off district in Cape Town in terms of socioeconomic wellbeing (CCT 2007). According to the 2011 Census, ward 80's unemployment rate is of 38% for adults aged 15-64, whilst 78% of households have a monthly income of ZAR 3,200 or less (CCT 2013b). A detailed survey conducted in Sweet Home in 2005 (CCT 2005, p. 45) states that the average household income, not including households "where everyone was reportedly unemployed and dependent on handouts for support from other family members and state welfare", is of ZAR 1,272. In Sweet Home, a household which is relatively better off thus earns approximately 130 euros per month.

---

[8] Meaning high percentages of low monthly income, low education, unemployment, and labor force employed in unskilled/primary occupations.
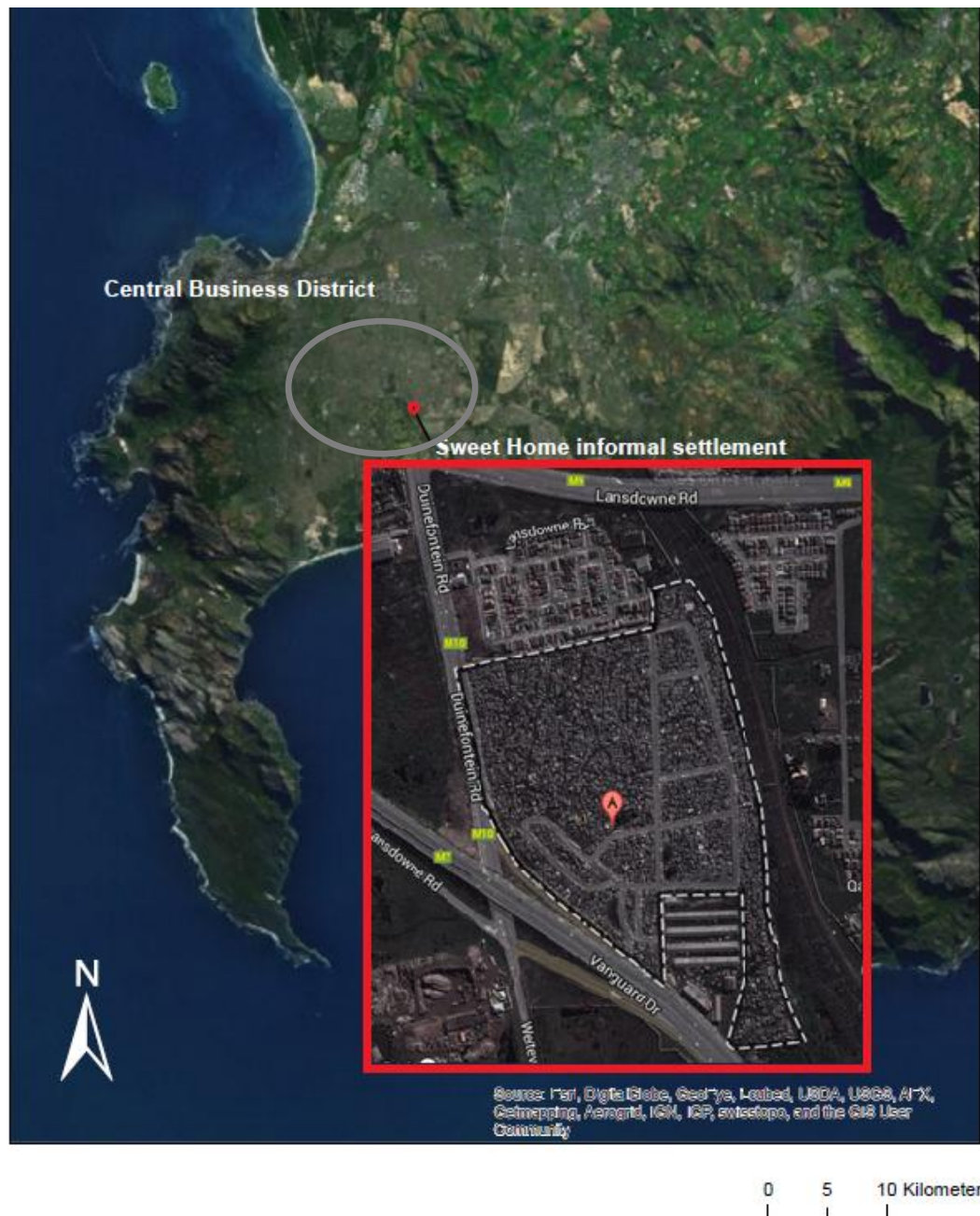
Sweet Home resident Aviwe (2013) underlines this point. She states that her community

> "is for the people that don't have money, let's put it like that. And, I think because of the way [they] desperately need the places, they don't even know that at the end, this land is wet".

Sweet Home is one of the nine informal settlements classified as high risk by the Task Team in 2013. It is large enough to capture a broad diversity of initiatives, as the CCT and several CSOs are active in the settlement to tackle the flooding issue (Sacks 2012; DiMP 2009). Two additional main characteristics set Sweet Home apart, first relating to spatial heterogeneities within the settlement, second to the tensions among local leaders.

Indeed, Sweet Home's 17,5 hectares are divided into two distinct areas; one third of the land where basic services (such as water sanitation services, electricity, gravel roads and open drains connected onto existing underground infrastructure) are in place since 2006, and the remainder where basic services are lacking and where the density of shacks is particularly high (DiMP 2009, p. 6). This can be traced back to the previous land ownership situation. The land without services was privately owned and only sold to the CCT in December 2012 (Sacks 2012). Presently still belonging to the railway company *Transnet*, the Eastern strip of the settlement is not serviced either.

Politically, the local leadership in Sweet Home shifted in 2011 from a state of quasi-dictatorship by an ANC supporter to a more inclusive committee-based leadership structure. As reported by residents (2013; interviews conducted by Sacks 2012), the previous community leader had been focusing on electoral politics rather than accounting for the needs of Sweet Home residents. For instance, residents stated that the previous leader had often reserved the community hall for ANC activities, and charged community members for its access (Sacks 2012, p. 9). Frustration peaked in August 2011, leading to community members breaking into the community hall and replacing its lock. The present chairperson (2013) details the informal leadership structures which were then instituted in Sweet Home:

> "There was a day people said yeah, we put down [the previous community leader] and then they said 'ok, who will lead us?'. And then they choose us to lead the community. […] They elected me, and my deputy, secretary, and they elect treasurer, elect an organizer… […] and then I said to them 'no we can't function, if we do like this, we need to go even to the sections'. Trying to make sure these sections they elected their street committees. And then I'll make sure that things are happening."

Elected street committees are now responsible for each of the seven sections into which the settlement was divided. The present community leadership counts supporters of a broader range of political parties, and is, also according to residents (2013), headed by a 'less corrupt' chairperson (Sacks 2012).

Methodology

As briefly sketched in the introduction, the main research question answered in this thesis is

> In which initiatives do stakeholders engage to increase resilience to flood risk in Sweet Home informal settlement, and to which extent and why are their efforts (not) successful?

'Successful' might be a very fuzzy term. However, we set a simple and pragmatic benchmark for determining the success of one initiative – it is successful if respondents state that implemented initiatives do in effect resolve factors leading to the occurrence of floods (vulnerability factors), or mitigate consequences of floods (flood impacts) within the community of Sweet Home. Both, vulnerability factors and flood impacts, are summarized under the term 'conceptual problem areas'. These conceptual problem areas are identified by those first impacted, namely residents themselves. 'Being successful' is thus operationalized as follows:

- Feasibility assessed as high by most stakeholders, i.e. resources are available to the stakeholders and can be used to implement an initiative;
- Effectiveness assessed as high by most stakeholders, i.e. the initiative does indeed mitigate one or several of the vulnerability factors at the root of flood risk, and/or one or several flood impacts.

On the other hand, one cannot talk of success when at least one of the following conditions is fulfilled:

- Feasibility is assessed as low by most stakeholders;
- Effectiveness is assessed as low by most stakeholders;
- A conceptual problem area is not targeted by any initiative.

It follows that the initiatives implemented and planned by different stakeholders to increase resilience to flood risk within the informal settlement Sweet Home, as well as those missing to tackle conceptual problem areas, form the object of this study. Research on initiatives pursued by stakeholders within defined functional segment such as different CCT departments should be complemented by the study of linkages between these segments (Renn 2008, p. 9). We therefore also look at governance and multi-stakeholder processes to design, decide upon, implement and adapt initiatives.

In line with the critical realism epistemology adopted in this study, stakeholders' perceptions and valuations of initiatives form an important cornerstone of the research. While a real objective world exists independently of people's experiences, the lived realities vary for each person, depending on his/her subjective experiences (Summer and Tribe 2008,

p. 59). The 'one truth' does not matter as much as 'one of the realities' as perceived by stakeholders.

Research sub-questions and conceptual scheme

The answers to the following sub-questions will provide the building blocks to answer the main research question:

Sub-question 1: Through which conceptual problem areas (vulnerability factors and flood impacts) does flood risk manifest itself in Sweet Home?

Sub-question 2: Who are the specific stakeholders involved in initiatives to increase resilience within the informal settlement Sweet Home?

Sub-question 3: What form do their initiatives take (targeted aim, means involved, initiator and implementer(s), time span)?

Sub-question 4: How do the stakeholders judge the effectiveness and feasibility of initiatives, implemented by themselves and by others?

The following scheme (fig. 7) gives an overview over our conceptual framework. The problem the research focuses on is flood risk, resulting from the presence of both a hydro-meteorological hazard agent and the vulnerability of a socio-ecological system. The present form flood risk takes in the settlement is covered by sub-question 1. We wish to understand how in practice, the goal of resilience to flood risk is attained. The process of reaching resilience is described as sub-questions 2 and 3 (which initiatives are implemented by which stakeholders) are answered. To which extent the goal is attained will be determined by answering sub-question 4.
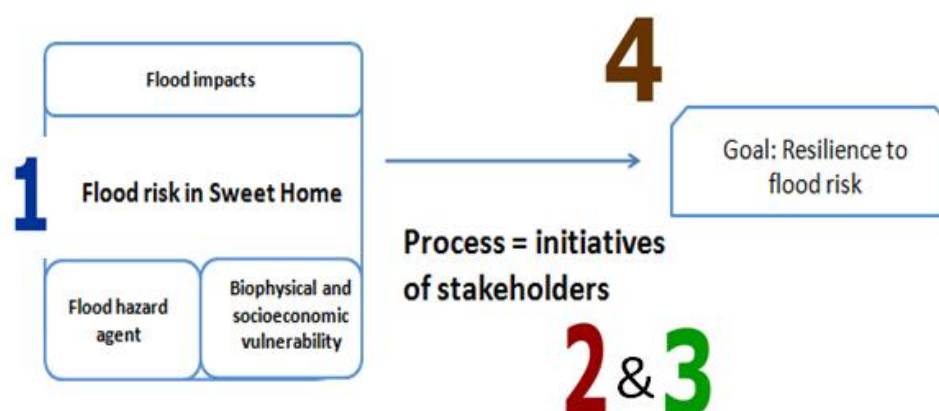
Figure 7: Conceptual scheme. Source: Author 2013

24

Data collection

Fieldwork was conducted in Cape Town over a period of five months, from end of January until end of June 2013. The research endeavor was embedded in the larger Flooding in Cape Town under Climate Risk (FliCCR) project launched in 2010. While the coastal component focused on sea-level rise and storm surges, the inland component, to which this thesis contributes, aimed to understand and strengthen governance processes for flood risk reduction in informal settlements. Data was collected to capture experience of flood risk and flood management at household, community and municipal level. Following the recognition that constructive engagement between stakeholders was missing, yet crucial, the final phase of FliCCR (2012-2013) aimed to explore opportunities offered by multi-stakeholder platforms (Ziervogel and Smit 2009). The processes and exchanges taking place around and during those platforms themselves yielded valuable data.

In this thesis, some findings are based on primary data collected by project team members before 2013.[9] In 2013, interviews with CCT officials, councilors and CSO members were nearly all conducted together with Joy Waddell, PhD student at the University of Cape Town with similar research interests. Also for reasons of safety and logistics, a large majority of the data on Sweet Home was collected in the settlement together with Joy Waddell and/or Juliette Dixon, Master student from the University of Manchester. Secondary sources and (participant) observations, as intern within the Department of Environmental Resource Management at the CCT, as member of the FliCCR team, and as inhabitant of Cape Town receptive to the larger context, further complete the collected data.

Data collection at community level

While practical factors weighted in the selection of Sweet Home[10], the contextual chapter also clarified why the settlement, vulnerable to flooding and subject to efforts to increase resilience from various stakeholders, constitutes a highly appropriate case-study unit. A total of 66 Sweet Home residents (41 females, 25 males) participated in 16 in-depth open ended interviews, one transect walk, five participatory workshops as well as two FliCCR workshops, one of them being held directly in Sweet Home. The workshops alone assembled 32 residents. All interviewed residents were adults having lived in Sweet Home for a minimum of one year, thus with sufficient knowledge on initiatives to increase resilience to flood risk. To achieve diversity in viewpoints, residents living both in the serviced area and in the area devoid of hard infrastructure were included in the data collection process. Except for the first mixed session, women and men were separated

---

[9] When followed by '2010', quotes are copied from interview notes taken by Kirsten Anderson (five CCT interviews). When followed by '2012', they are from transcripts of interviews conducted by Joy Waddell (ten resident interviews). The thesis by Juliette Dixon (2013) is cited as secondary source. Photographs are always indicated as being sourced from 'FliCCR 2013', regardless if they were taken by the author or other FliCCR team members.

[10] Joy Waddell, PhD student part of the FliCCR team had already collected data in the settlement and could introduce me to the relevant gate-keepers.

during the participatory sessions. Participant observation and informal discussions, inside and outside Sweet Home, helped round off the picture of residents' experiences. In-depth interviews with the community leader and his wife as well as informal visits, discussions and presence of committee members during the workshops capture processes at community level.

Semi-structured interviews focused on residents' experience of flood risk, on the initiatives implemented at household and community level, as well as by external stakeholders.[11] One insightful exercise consisted in asking participants to identify best and worst initiatives.

Figure 1: Participatory activities conducted with residents. Source: FliCCR 2013

Information on similar topics was gathered during five participatory meetings, during which residents engaged in focus group discussions, mapping, institutional mapping, making of causal flowcharts, asset identification and ranking activities. Most of these activities were inspired from Lopez-Marrero and Tschakert (2001), from the Urban Participatory Climate

---

[11] Some respondents expressed themselves in Xhosa or Afrikaans – a translator was present, when applicable the translation is what is written down in this document.

Change Adaptation Appraisal methodology by Moser and Stein (2011) and from the Participatory Assessment of Development methodology by Dietz et al. (2011). Two focus group discussions with a smaller round of women helped to gain additional insight into the context of Sweet Home, in particular the nature of community ties and political tensions.

Data collected from external stakeholders

At municipal level, eight out of the 22 CCT departments represented on the *Task Team* were directly approached. These departments were seen as more centrally involved in the proactive planning of flood risk interventions in informal settlements. 24 officials from the administrative realm participated in open-ended interviews. In most cases, these respondents were either representatives of their department on the *Task Team* or based in area offices responsible for monitoring and implementing DRR initiatives in Sweet Home (cf. table 1 for a list of approached departments).

Table 1: CCT departments engaged with for this study, amount of interviewees within each department in brackets

Department	Directorate
Environmental Health (3 interviewees)	City Health
Informal Settlements (4)	Human Settlements
Engineering Services	Human Settlements
Development Services (1)	Human Settlements
DRMC (5)	Safety and Security
Transport, Roads and Stormwater (2)	Transport, Roads and Stormwater
Solid Waste Management (1)	Utilities
Water and Sanitation (2)	Utilities
World Design Capital	Tourism, Events and Marketing
Environmental Resource Management (1)	Economic, Environmental and Spatial Planning

Being an intern within the CCT provided the opportunity for interaction with two officials from the World Design Capital department, as well as for a focus group discussion with 11 Environmental Health officials. Although discussions were not held within an official research setting, these officials subsequently agreed for their statements to be used in this thesis. Assisting at a meeting of the *Urbanization Forum*[12] as well as at a sub-council meeting provided additional insight into the administrative and political realm of the CCT structure. The political realm was further taken into account by interviewing one ward councilor, one proportional representative councilor and one sub-councilor, all elected within the sub-council/ward to which Sweet Home belongs.

---

[12] A platform on which CCT departments adress service backlog issues.

Moreover, interviews were conducted with four CSOs: the *Mustadafin Foundation*, the *Warehouse*, the *Red Cross Society of South Africa*, and the *Jungle Theatre*. Those were selected based on their involvement with the *Task Team*, their presence in Sweet Home[13], and their participation in FliCCR workshops.

During all interviews conducted with external stakeholders, discussions focused on initiatives planned and implemented by the respondent's department, political body or organization to increase resilience to floods in Cape Town's informal settlements. Interviews also aimed to capture the extent of knowledge and valuation of initiatives implemented by other stakeholders, be they from within or external to Sweet Home. The valuation of initiatives was gathered by asking respondents to place little cards, each naming one initiative as cited by the respondents, into the four categories 'makes a big positive change/improves the situation a lot', 'makes a positive change', 'make no difference', 'worsens the situation' (cf. fig. 8). Respondents were asked to elaborate on the reasons behind their classification.

Figure 8: Example of the output of a ranking activity as conducted with respondents from the CCT and CSOs. Source: FliCCR 2013

Data collection on multi-stakeholder processes

Data on the multi-stakeholder processes, and initiatives carried out by academia, was collected through participant observation and recording of discussions over the course of

---

[13] Those CSOs were frequently mentioned by residents, during interviews or institutional mapping exercises.

four multi-stakeholder workshops. Workshops were organized firstly to understand and support flood management activities, then to provide a platform for multiple stakeholders to enter into dialogue on the issue. For an overview of the aims and outcomes of the four workshops and the stakeholders involved, see Annex 1. Additionally, we conducted one interview with the facilitator co-organizing the multi-stakeholder workshop which assembled the largest variety of stakeholders.

Data analysis

In addition to (participant) observation, interviews, multi-stakeholder workshops and analysis of secondary sources, which all yield data useful to answer all four sub-questions, outputs from the used data gathering techniques are linked back to our sub-questions as specified in table 2.

Table 2: Data gathering techniques and how they link back to the sub-questions

Data collection technique	Sub-question
Focus group discussions / Participatory mapping / Transect walk / Causal flowchart	1. Describe flood risk
Focus group discussions / Institutional mapping	2. Identify stakeholders
Asset listing and ranking / Initiative listing and ranking / Transect walk	3. Describe initiatives
Focus group discussions / Initiative ranking / Transect walk / Multi-stakeholder workshops	4. Capture valuation of initiatives, and explanations for high or low valuation

All interviews were documented using a digital recorder. Observations and activity outputs, for instance from participatory sessions and workshops, were photographed, recorded, or noted down. Respondents are kept anonymous, residents names were modified to preserve confidentiality. The department of a quoted 'CCT official' (referring to a stakeholder belonging to the administrative realm of the CCT) is specified when it adds up to the analysis, the same applies for the party to which a quoted 'councilor' (political realm of the CCT) belongs.

Most collected data is of a qualitative nature, but sometimes complemented by basic quantitative and spatial analyses. Qualitative data from interviews and focus groups was transcribed and coded to draw out patterns. The codes were partly derived from the conceptual framework (initiative, stakeholder), partly dictated by the data itself.

Assessment of the quality of the research

A mixed methods approach and triangulation between different data sources, comparing between respondent statements, observations and literature, help ensure validity. Employing mainly interpretive research methods, we have no ambition of generalizing findings from the Sweet Home case-study to the entire city or beyond. Moreover, the settlement and the amount of stakeholders involved there being large, additional selection bias occurred concerning stakeholders and initiatives. Within the constraints of this thesis, initiatives of government institutions above the local level could not be included. Respondents mostly guided the selection of initiatives at household, community and municipal level, assuming that initiatives being named unprompted and by a large variety of respondents are also the most relevant to increase resilience to floods in Sweet Home. An interview question did however explicitly ask for non-structural initiatives, in particular awareness raising, so as to make sure this 'soft' aspect of resilience was not left out.

We could not engage with two primordial stakeholders: Sweet Home's ward councilor, and the owner of the land adjoining Sweet Home. Although invited, the former did not attend multi-stakeholder workshops and was not accessible for interviews. The private land owner was not contacted by choice, as this could have influenced ongoing negotiation processes with residents and the CCT.

COMMUNITY RESILIENCE

Theoretical framework to capture community resilience

'Community resilience' is the concept of resilience brought to its 'most ideal', purest form: qualifying a spatially delimited community as resilient would be equal to stating that when residents within the community are confronted to internal and/or external shocks and stresses, they have the ability to recover from these pressures based on resources present internally only. Loosening up definitional traits, resilient communities are those which can "recover with little or no external assistance" (Manyena 2006, p. 432).

But rather than debating how strictly self-supporting a community has to be to earn the qualification 'resilient', the core message is that community resilience is deeply rooted in a context. On one hand, the community is seen as a socio-ecological system with its boundary, its specific users, resources at its disposition, and with its own governing formal and informal institutions. Yet, the socio-ecological system is still embedded within a larger social and ecological frame (Ostrom 2009, p.419; Folke 2006). Both the pressures the system has to withstand, and the means available to the system to cope with those pressures, or to adapt so as to be able to cope with them in the future, are highly context-specific. The challenge is then to develop a frame of analysis which examines "networks, linkages, connections, flows and chains across scales, but [remains] firmly rooted in place and context" (Scoones 2009, p. 144).

Vulnerability factors

Füssel's (2007) conceptualization of vulnerability proves useful when trying to distil characteristics of the socio-ecological system 'residents and their living environment' which must be overcome or strengthened to become resilient (Manyena 2006). He distinguishes between four categories of vulnerability factors. In line with the recognition that disasters are socially co-constructed events (Cannon and Müller-Mahn 2010, p. 622), socioeconomic and biophysical vulnerability are differentiated. A second dimension relates to the scale, specifying whether the vulnerability factor is intrinsic to the community at risk, or external. Füssel (2007, p. 158) states that the distinction between what is internal and what is external "typically reflects geographical boundaries or the power to influence", in our case the geographical boundary of Sweet Home informal settlement. Although Füssel lists globalization as an external socioeconomic vulnerability factor (cf. fig. 9), for the purposes of this case-study, the focus has been restricted to internal and external factors up to the spatial delimitations of the Cape Town municipality. This not only because more is not

possible with the given constraints of this thesis, but also as we place more value on analytical depth than analytical breath.

Examples for each of the four categories of vulnerability factors classified according to the dimensions sphere and knowledge domain

Sphere	Domain	
	Socioeconomic	Biophysical
Internal	Household income, social networks, access to information	Topography, environmental conditions, land cover
External	National policies, international aid, economic globalization	Severe storms, earthquakes, sea-level change

Figure 9: The four categories of vulnerability factors. Source: Füssel 2007, p. 158

In the present study context, differentiation between external and internal factors is particularly interesting concerning the socioeconomic domain, and gains to be complemented by the livelihoods approach. The latter aims to capture the various strategies people engage in to make a living, and recognizes that financial resources are by no means sufficient. They must be coupled with capabilities, such as sufficient level of education and social connections, to identify and exploit opportunities (Scoones 2009, p. 172). The sustainable livelihoods approach in particular aims to understand how livelihoods are shaped so as to be able to withstand shocks and stresses, much in line with the resilience approach (Sen 1999, p. 14; Chambers and Conway 1991, p. 4). Combining both Füssel's framework with a livelihoods approach, internal socioeconomic vulnerability factors are thus linked to the presence or absence of assets at individual, household and community level, in particular the financial (e.g. savings), material (e.g. housing, tools), human (e.g. level of education) and social (e.g. strength of community ties) types of assets. It is important not only to list assets, but also to observe how they are connected into 'outputs', how they are used as "vehicles for instrumental action (making a living), hermeneutic action (making life meaningful) and emancipatory action (challenging the structures under which one makes a living)" (Bebbington 1992, p. 22). Here, the question is how residents mobilize assets, within their household or at community level, to cope (mainly an instrumental action) or adapt (mainly an emancipatory action) to flood risk. To know what affected communities are currently doing themselves, and with which level of success, is key to determining how community resilience can best be strengthened (Manyena 2006, p. 434). That is why how residents value initiatives, both concerning feasibility (if the assets at their disposition

enable them to implement an initiative) and effectiveness (if the initiatives actually contribute to increase coping and/or adaptive capacity) plays a role within our analysis.

Again however, "while human beings should be at the center of any resilience program, they do not live in a vacuum but instead are part of systems that impact on losses and the locality's ability to deal with them" (Manyena 2006, p. 444). The presence of assets and the level of agency to mobilize them depend on the extent to which residents are constrained by broader social, economic and political processes, at community level but also above. As put by Norris et al. (2008, p. 130), "adaptive capacities are resources with dynamic attributes". External socioeconomic vulnerability factors play a key role in shaping adaptive capacity, as they make those resources, or assets, static, instead of dynamic. They hamper the introduction or enhancement of the "fundamental values, assets and resources that can be applied to the process of adapting to diverse circumstances" (Manyena 2006, p. 439). Residents of informal settlements are more likely to face many and strong external biophysical and socioeconomic vulnerability factors, being confined to risk-prone environments without secure tenure, often outside of formal jurisdiction and excluded or discriminated from formal decision-making processes and DRR activities (Ahammad 2011; Bulkeley et al. 2011). A point underlined by Steinberg and Miranda (2005, p. 166): the poor suffer "directly from the lack of management and planning systems that address their problems and adequately deal with the growth of cities".

To summarize, all four types of vulnerability factors deserve attention. Resilience cannot only be achieved by reducing specific external threats to the system. It is also increased by building the system's coping and adaptive capacity in a manner which is coherent with how the system currently functions and the difficulties, intrinsic to the community or resulting from external forces, it faces. Internal socioeconomic vulnerability factors determine the core of community resilience (being able to cope with external shocks and stresses when they arise), while external socioeconomic vulnerability factors are paramount to assessing the level of adaptive capacity (ability to change input factors, to innovate, so as to become resilient).

Resilience and adaptive capacity in Sweet Home

We now address the research's empirical findings, starting with the resilience of the socio-ecological system Sweet Home in its restrained sense – as a spatially delimited community encompassing residents and their assets. Füssel's conceptualization of vulnerability (2007) will serve as framework to assess which factors lead to flood risk in the settlement. As external socioeconomic vulnerability factors originate in the broader context of Cape Town, they will be presented later in our analysis.

Flood impacts on the community

> "Sweet Home is the sour home now, because of rain" (Ziyanda, Sweet Home resident 2013).

Like clock-work, floods are expected in Sweet Home every winter, and deeply disrupt the residents' livelihoods year after year. Among the interviewed residents (2012 and 2013), majority experienced water entering their shacks every winter, flowing in from the roads and alleys or directly coming from the shack ground and/or through the roof. Sewer blockages also lead to greywater spilling over into storm water channels. The health hazard posed by stagnant water was cited most often as a negative consequence of the flooding both during interviews and participatory sessions (2013); causing bad odors but also stress, flu, asthma, diarrhea, tuberculosis, cholera and rashes, especially for the children playing in it. One case of a child drowning in the water was even reported. The residents' mobility is also impacted, with flooded alleys and residents confined to the relative shelter of their homes; children are unable to attend school and employed residents sometimes have to stay home to take care of their shack, for instance emptying buckets before they overflow and the dampness damages their shack structure and moulds their furniture, clothes and groceries. Sales at informal street businesses drop as a result of this decreased mobility.

Figure 10: Restricted mobility in Sweet Home informal settlement. Source: Dixon 2013, p. i

The frequency of electric power failures on the other hand increases during the winter months, some related directly to floods as illegal connections and fuse boxes get wet. As a consequence, some residents have to refrain from using electrical appliances, which makes

cooking difficult (DiMP 2009, p.11). Crime rates tend to go up during winter, as *skollies*[14] move unnoticed through deserted alleys and the sound of rain masks shacks being broken into and victims' cries for help.

Biophysical vulnerability factors

Several biophysical factors explain why Sweet Home is highly prone to flooding during the winter months. The situation of Sweet Home on a mountainous peninsula, with its inherent high levels of precipitation, is the main external biophysical factor. Internal biophysical factors count the location on a former landfill site in a wetland area with high water tables (leading to quick saturation), sandy soils, non-existent vegetation covers due to the high population density, and undulating topography with shacks built directly on the ground in low-lying sections. An especially low-lying area in the middle of the land acquired by the CCT in 2012 often gathers excess water, the same applies to a retention pond on the south-western corner of Sweet Home.

Shack density and presence of services (drainage infrastructure, as well as solid waste collection points and ablution blocks where waste water should be disposed of) also show important levels of spatial variation across the settlement. Within the settlement, land ownership plays a determining role as it relates directly to shack density and presence of sewage and drainage infrastructure – those internal biophysical vulnerability factors thus have their root in an external socioeconomic factor (cf. fig. 11/12a/12b). Shack density decreases and the density of services increases depending if the land is owned by the railway company Transnet, by the CCT since 2012, or by the CCT for a longer period of time. This situation should soon be remediated in the CCT 2012 area as plans for re-blocking are under way, lack of services and high shack densities will however persist in the foreseeable future on the Transnet section, even if according to residents (2013), the CCT is currently negotiating with Transnet to buy the land.

Flood risk is acute in the Transnet and CCT 2012 areas, as excess water is not channeled within drains and the distance to ablution blocks and waste collection points is especially high, potentially leading to littering and increased health hazard following the flood. Density also influences flood risk and how it can be dealt with; more households are impacted and narrow alleys make some areas inaccessible to large vehicles such as pumping trucks. High shack density also means households feel the brunt of structural changes operated by those living close to them, for instance if a neighbor elevated his shack and the water subsequently gets redirected towards one's own dwelling place.

---

[14] Name given to local small-scale criminals, mostly robbers
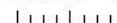
Figure 11: Variation of topography, density and presence of services depending on land ownership within Sweet Home. Source: Author 2013

Figure 12 : Large streets, open drains and ablution blocks with flush toilets in the area owned by the CCT (left), a narrow lane blocked by a truck pumping out human waste from the chemical toilets on the Transnet land (right). Source: FliCCR 2013

It should however be noted that flood risk remains high even where open drains (called hyson cells) have been installed, as those can end up being blocked. Reasons for blockages are numerous. One of those reasons is that residents dispose of their waste and waste water, sometimes even night soils, on open land, in storm water drains, in gullies and in manholes, next to waste containers instead of in them (cf. picture below, Sweet Home residents and CCT officials from various departments, 2013).

Figure 13: Waste accumulating next to the waste containers in Sweet Home. Source: FliCCR 2013

 In some cases, the blocking of drains is premeditated; at a small scale when residents fill the open drains with rubble or sand to improve access from the street to their shack, at a larger scale and with farer-reaching consequences at the street intersection close to the

grouping of shacks known as C section. This is a low-lying spot to which most drains in the settlement converge, the excess water being eventually linked up to the major underground drainage system after crossing a privately owned plot of land (CCT officials from the Transport, Roads and Stormwater (TRS) Department and Water and Sanitation Department 2013). The water crossing the property through the single open drain being dirty and smelly, the private owner blocked its entry, resulting in large amounts of water being pooled at that particular intersection up to several days after a major downpour (cf. fig. 14). Nearly all residents living in C section cited the private owner's behavior as main cause for flooding, highlighting again the social co-construction of flood risk. The same can be said for the 'sunken floor' shack construction practices prevalent in the entire settlement: one mostly steps down on bare soil when entering a shack, increasing the risk for water to rise up directly through the floor (councilor 2013).

Figure 14: Flooding in C section on the 13th of June 2013. Source: FliCCR 2013

Internal socioeconomic vulnerability factors

Internal socioeconomic vulnerability factors influence the level to which the community will be impacted once flooding strikes – if the assets at their disposition enable households and the community to enact initiatives to proactively limit the impacts described above, or to recover quickly. Initiatives are to be understood widely, implemented punctually or on the long-term, consisting in material structural changes or not. The factors can be summarized in two broad categories: low socioeconomic status at household level, although it varies by household and location of that household within the settlement, and a particular lack of social capital at community level due to leadership tensions.

At household level

Additionally to interviews and focus groups, asset identification exercises (cf. figure 15) conducted with both a female and male group pointed to the importance of a broad range of assets which can contribute to a household's resilience to flooding.[15]

Figure 15: Asset identification exercise. Source: FliCCR 2013

Material assets were cited first and most often; buckets, wheelbarrows, 240L refuse bins (called 'black wheelie bins'), spades, wood, corrugated iron sheets (called 'zinc'), plastic covers and nails for the roof, as well as sand and rubble are instrumental in protecting one's dwelling place for the flood. So called 'wendy houses', ready-made wooden structures which can be elevated on pillars, are assessed as particularly effective for coping with floods. Most of these assets can be purchased in the vicinity of the settlement, whilst rubble and stones are often collected along Duinefountain Road and Vanguard Drive, the two major roads bordering Sweet Home on the Western side. The residents living close to those transportation axes are thus advantaged, also as it is easier for them to catch taxis to shops and their working place.

The main constraint to get the materials is however a lack of financial assets:

> "If I can tell them 'no if you can put the concrete in your shack, and maybe you can do the tiling, and having the stoep[16] that is going up'… then they are going to ask me 'where am I going to get that money to do that?'" (Aviwe[17], Sweet Home resident, 2013).

Many of the residents we interacted with were unemployed and had to engage in informal activities, such as selling chicken feet, to make ends meet. The employed ones earn low salaries as low-skilled labor, and have to spent large amounts on transportation to and from the working place. Money covered everyday expenses and could hardly be saved.

---

[15] Resilience was explained to participants as 'being prepared': If there is a flood, this person does not have a problem because she/he is prepared. What does she/he have which makes her/him prepared, what is this person like?

[16] Little solid barrier at the entry of a shack

[17] Aviwe is also the wife of Sweet Home's current chairperson, a non-negligible factor.

Participation in saving groups as well as adapting one's livelihood strategy (e.g. taking on additional work during summer to save money for medical expenses during winter) can contribute to a household's resilience by allowing more financial flexibility. However, statements hinted that only households with a more solid existing asset base, those which are also more organized when it comes to preparing their shacks for flooding, gain real long-term benefits from saving groups. During an initiative ranking exercise, female participants thus differentiated between saving groups which lead to resilience, and others which put an additional strain on the already high burden households have to carry. For those households, long-term planning would disrupt day-to-day activities too profoundly. Faith-based organizations, such as church congregations, can also be of some financial support, as trust levels among members are high and facilitate money lending.

Human capital was recognized as playing an important role in the form of health, education, character traits. Residents have to be strong to face adverse circumstances and retain, or further develop, their asset base. Except a crèche and a few health facilities which are of more informal nature (a mobile clinic in particular), there is a lack of educational and health facilities in the settlement, residents have to travel to go to school or to the *Philippi Public Clinic*, about 2.5 kilometers away. The residents are highly isolated. This isolation takes form in a purely spatial sense, i.e. remoteness from education and health facilities, from economic nodes with employment opportunities. With their low level of educations and with the current economic situation, the job market is even more difficult to attain for residents. Accessing opportunities and assets outside of the settlement is not only costly in time and money, but also dangerous, as communal taxis sprint on the highways, sometimes causing crashes. *Skollies* themselves are particularly active robbing and attacking commuters close to train stations and along major transportation axes (Sweet Home residents 2013).[18]

Education and character traits in particular influence awareness level and attitude towards flooding, such as if one is still fighting or has given up hope. They also impact on behavior, for instance if someone will make the effort to walk the long distance to the ablution blocks, or will dump waste water in the adjacent drain or open land. This is linked to the concept of *ordendlikheit* (decency), i.e. norms of living to which women in particular have to comply in South African informal settlements[19] (Ross 2010, p. 17). It seemed that religion plays a major role in giving strength and faith that the situation can be improved, thus fostering agency. Still, the overall theme was residents' helplessness towards the floods, and feeling of being abandoned by (local) government when provision of proper houses and services, or

---

[18] Sweet Home is not well connected to Cape Town's economic hubs (city centre, northern and southern suburbs), as this quote by Nazibuko (Sweet Home resident, 2013) shows: "People they are commenting with the transport here. You see, it is difficult to get the transport here". Travelling into town can take hours if one does not own a car.

[19] Such as keeping one's shack clean and tidy, keeping to the settlement, not drinking wages away.

relocation, would actually be the only way to solve the issue. In many cases, this leads to residents' attitudes of passivity.

Finally, social capital enables to cope with flooding, as networks of friends, family, fellow church or mosque goers and neighbors can be of support by complementing assets which lack in a household:

> "I have a friend who owns a rubble business… he sometimes drops off stones next to my shack" (Imitha, Sweet Home resident, 2013).

Help from men, who were considered by a few as the only ones able to carry out certain activities such as repairing the roof, is particularly valuable in a settlement where female-headed households exceed male-headed households (DiMP 2009, p. 5). Friends who help without expecting anything in return were highly valued.

When one or many of these assets are lacking, the situation quickly becomes untenable, as for this unemployed resident living at the bottom of a slope and not supported by her husband:

> "I cannot do it. I am finished, I am falling into pieces… He is a lazy man" (Margaret, Sweet Home resident, on being proactive to gear her shack for the floods, 2013).

This general lack of assets is also reflected in the initiatives implemented at household level to cope with flooding (cf. table 2 and figures 16a and 16b). It is interesting to note that most initiatives named by residents are reactive (initiatives marked by a red dot) and small in scope. The three initiatives which stand out (using buckets to collect water, drying up and swiping water out of the shack, doing nothing) require very little effort/assets. In contrast, initiatives which involve deep livelihood shifts (including saving larger amounts of money to invest in a wendy house) are barely mentioned. The household initiative which according to both residents and external stakeholders was most effective in reducing flood risk, namely elevating floor levels, comes in tenth position in terms of implementation. One initiative actually contributing to flood risk (marked by a purple dot) comes in fourth position: eight residents (2012 and 2013) admitted to not disposing of their waste and/or waste water correctly, most often because the distance from their shack to ablution blocks is too important, or because the shipping containers in which waste should be disposed of are always locked.

Table 2: Household initiatives impacting on flood risk[20]

Frequency of initiatives implemented at household level

Initiative	Amount of times an initiative was cited by residents
Adapt livelihood strategy	1
Buy a 'wendy house' (wooden house on pillars)	1
Prevent own children from playing in greywater	2
Follow the weather forecast	2
● Contact a councillor/lodge a complaint a sub-council office	2
Dig a trench around the shack	3
Turn around the shack so that water does not flow in through the door	3
● Contact the CCT	4
Correctly dispose of solid waste/ waste water	5
Invest in raingear such as gumboots	5
Elevate shack floors using sand, rubble, self-mixed cement or bricks	5
● Visit the (mobile) clinic	5
Build a dyke using wood, sand, rubble or self-mixed cement	6
● Contact a committee member	6
● Place cement blocks and crates/stones to walk on inside the shack	6
Water-proof the roof (with plastic sheets)	6
☆ Do not dispose of solid waste/waste water correctly	8
● Do nothing, expect others to act	10
● Push out the water and dry up the shack	13
● Place buckets under leaking roof	14

● Reactive initiative

☆ Initiative increasing flood risk

Figures 16a and 16b: Sweet Home residents constructing dykes to prevent water from entering the shack (left, proactive measure, Source: FliCCR 2012), and using buckets to catch water from leaking roofs (right, reactive measure, Source: Resident's photo)

---

[20] During interviews, initiatives were not prompted but cited by respondents themselves – the frequencies thus do not inform on the actual amount of households carrying out an initiative, but on the initiatives households carry out and judge worth mentioning (answering the question "what do you do in your house to prepare for the flooding, or once it floods?").

Residents considered the overall effectiveness of their own initiatives as low. Essentially, they enable households to cope with flooding up to a certain level only, and contribute to making the problem 'less worse, but not good':

> "It's the only alternative. It makes a difference it doesn't make a difference. It just means I can move around in my kitchen" (Margaret, Sweet Home resident 2013, on putting stones within her shack to walk on).

At community level

The extent to which social capital is present at community level deserves particular attention – households do not only receive supports from their own private social networks (friends and family living within or outside of the settlement). On the contrary, residents do in some cases pool or transfer assets, mostly spontaneously and informally. Exceptions would be saving groups with very strict participation rules, and initiatives coordinated by each of the nine section's sub-committees (called 'street committees' by residents), or by the main committee with representatives of the seven sections, headed by the community leader. Solidarity and care between residents manifests itself by residents watching over their neighbors, mostly the elderly and sick, and passing on knowledge on hygiene, waste disposal, as well as preventing children from playing in greywater. According to a CSO member (2013) active in Sweet Home with *The Warehouse* since 2007, there is a lot of collaboration and cohesion in Sweet Home. The community is united across divides: residents belonging to the minority colored population group are well integrated (DiMP 2009, p. 5), and community members prevented external Xhosas from coming into the settlement and taking foreigners out during the xenophobic attacks of 2008.

But community solidarity should not be romanticized either. For instance, chemical toilets supposed to be shared between households are sometimes 'hijacked' by single households who place them within their yards. Also, the chairperson pointed out that residents living on the south-eastern edge of the community, known as 'Z-section', are not officially part of ward 80, thus of the community; political marginalization does take place at an informal level within Sweet Home. [21] Collective action issues come into play when residents do not understand why they should employ their household assets (incl. manpower) to increase flood resilience in public spaces. An Informal Settlements official (2010) thus stated that residents expect to get paid by the CCT to carry out an initiative benefiting the community, such as digging a trench from a tap to the closest drain. Solidarity is especially not a matter of course during the cold and dark winter months, synonymous to less social interaction

---

[21] This was not confirmed when checking on the CCT's internal Geographical Information System (GIS) (Corporate ISIS Viewer 2013): According to the interactive map, all shacks within Sweet Home (defining Sweet Home through the boundaries on figure 6 in the contextual chapter) are part of Ward 80. It may be that the GIS is not accurate. The chairperson (2013) reinforced that residents of the Z section vote for the ward called Samora.

with family and friends. When it gets cold and dark, shacks transform into islands whose inhabitants have to struggle on their own (Dixon 2013, p. 53). Gossip and pride also prevent some residents from accepting offers, such as shelter at a friends' shack when one's own is flooded, or a neighbor's advice on waste disposal. The following quote shows that advice is seen especially negatively when it comes from the leadership, being interpreted as a "bad attitude", an abuse of power, a will to "control" others:

> "This works [educating residents on correct waste disposal], but sometimes this make me to be a target to them. When I say, sometimes they think like 'ok, this one is trying to control us', coming with a bad attitude. But I didn't worry about that. Always when you are leading the people, they think what you are not thinking" (Sweet Home Chairperson 2013).

These are a few factors explaining why initiatives carried out in collaboration with neighbors were scarcely mentioned by residents, and never unprompted. During the transect walk in particular, only two sites of community level collaboration were found: (1) the scattering of large stones and crates in alleys so that people can walk on them (cf. figure 17), and (2) the digging of a trench from a communal pump to the closest drain. Both aim to improve mobility in the settlement's public space, by mitigating flood consequences (1) or preventing small-scale flooding from happening (2).

Figure 17: Community-level initiative: Residents placing bricks on paths. Source: FliCCR 2013

Sweet Home's community leadership clearly plays the lead role when it comes to improving coping and adaptive capacity at community level, helping to access assets outside of the socio-ecological system Sweet Home, and also ensuring a fair allocation of assets within the community. Residents which are part of the leadership structure act as brokers in that "they

use assets furnished by the state", in our case local government, CSOs and academia, and "provide the means for others, less able, to gain access to these" (James 2011, p. 318). That is done at various levels. Street committees do so between households within each sections; the main committee and its chairperson are the main gatekeeper and brokers towards external stakeholders. According to various reports from residents (2013), fair allocation was a distant dream before the leadership shift in the community, the situation has now however improved, with street committees undertaking long-term proactive as well as disaster response activities.

The leadership undertakes long-term proactive initiatives conducive to resilience as it aims to tackle broad underlying vulnerability factors to flooding: targeting an internal biophysical vulnerability factor by keeping household numbers and shack sizes stable within the settlement, or addressing an internal socioeconomic vulnerability factor by taking on a peace-keeping role which can help improve ties within the community. This can contribute in strengthening the resident's asset base. As reported by the current chairperson (2013), the committees are also thinking about putting in place a "punishment", a dissuasive fee which would "make people scared" of not using services correctly, thus lowering the risk of blockages and health hazards.

The leadership also engages in reactive initiatives. In the aftermath of flooding, the committees notify the CCT on behalf of residents and precisely monitor the distribution of blankets, soup as well as materials provided by the CCT and CSOs:

> "When it's raining, as a committee they must walk around and check, which side is hurt. [...] Each committee member goes door to door in their section, they know their section. They check who needs what. For instance if the water comes in through the roof or the floor. If it comes through the floor, you don't need a plastic sheet to cover the roof" (Aviwe, Sweet Home resident, 2013).

The members of the street committees are in touch with the needs of each household within their section, they inform the residents of the presence of supplies in the community hall by going through the settlement with a megaphone, and also open the community hall so that temporarily homeless residents can spend a few nights there.

Yet, frictions between supporters of the new and the ANC-related old leadership remain. According to resident Aviwe (2013), political leadership tensions disrupt initiatives to increase resilience to flooding, as highlighted by the following statement relating to the distribution of supplies after a disaster strikes:

> "That is corruption, [the previous chairperson] takes the blankets [brought in a truck by DRMC], he gives it to people from the C section directly from his house. Then people think it is not from [the CCT]. Also [the current chairperson] was on the TV for

that report about flooding. [The previous chairperson] tells the people: '[the new chairperson] he doesn't care about you he is in Jo'burg or he talks to the people on the TV' ".

These internal frictions constitute an internal vulnerability factor, and explain why, as put by Luxolo, another Sweet Home resident (2013) the place "doesn't move".

> "Because here in Sweet Home farm that is there are too many politicians you know. So he's fighting about if you, you come here to help the Sweet Home farm, but your political party is DA and they are ANC […] That is why this place […] doesn't move really. Because someone is going that way, someone is going that way. […] don't work together, with the people."

Conclusions

We unpacked the broad concept of 'flood risk' into 'conceptual problem areas' - more tangible observable building blocks which are summarized in table 3 below. The community of Sweet Home is akin to a textbook case, clearly showing that flood risk arises from much more than rainfall, but rather from a complex interplay of internal vulnerability factors, both of biophysical and socioeconomic nature. We find that biophysical factors mostly explain what leads to the flooding phenomenon per se (or the nature and intensity of the "stressor" according to Norris et al. 2008), while socioeconomic factors account for why residents cannot deal with that phenomenon, both at household and community level (focusing there on their "resources", or assets in our case). In Sweet Home, the balancing act between stressors and assets leads to a tipping on the side of "crisis" every winter, as proved by the extensive list of flood impacts..

Table 3: Flood risk in Sweet Home, unpacked into conceptual problem areas

Internal biophysical vulnerability factors	Internal socioeconomic vulnerability factors	Flood impacts
Location on a former landfill site	Residents lack of financial assets (linked to hunger)	Health hazards (physical and psychological)
Undulating topography	Residents lack of social assets	Destroyed material assets
Shack structures	Residents lack of material assets (incl. building materials, tools)	Residents not able to stay in their shacks
Lack of services, especially in the CCT 2012 and Transnet sections	Residents lack of human assets (not including awareness)	Mobility in and around the settlement
Blocked drains, due to poor usage, maintenance or deliberate blocking by residents and external stakeholders	Residents lack of human assets - low levels of awareness surrounding flooding/use of services in particular	Electricity power failures
Shack density,narrow alleys and non-existent vegetation cover	Political tensions in the leadership	Higher crime rates

This is even more unnerving for two reasons. First, flooding is *expected* every winter. Second, such a crisis leads the community on a downward spiral, as floods in turn lower coping capacity, destroying and/or re-directing assets towards the mitigating flood impacts, rather than addressing vulnerability factors at the root of flood risk

Figure 18: Spatial distribution of vulnerability factors across Sweet Home informal settlement. Source: Author 2013

47

Flood risk is also complex as the factors and impacts show spatial variations across the settlement, as illustrated on the map below. For instance, the drain blockage just north of the privately owned land (framed in red on fig. 18) leads to a major flooding hotspot at the so-called C section. The threshold for coping is then set higher for residents living in such areas, more assets are necessary to face even more adverse biophysical circumstances. That risk is an inherently spatial phenomenon requiring spatially adapted solutions is by no means a discovery (Chen et al. 2003, p. 546). Still, the fact that not only biophysical, but also socioeconomic factors have a spatial component is worth highlighting. A community is often romanticized, for instance described as a "small spatial unit, as a homogenous social structure, and as shared norms" (Agrawal and Gidsen 2005, p. 630). Here, leadership tensions divide the community, a phenomenon which also translates spatially: the leadership, both present and past, plays a brokerage role in allocating assets, and favours or excludes specific households depending in which sections they live (cf. map). This reflects a lack of what Satterthwaite and Dodman (2013, p. 291) call the "political dimension of resilience", according to which authorities are "genuinely responsive to the priorities and needs of all residents" – a dimension which is often overlooked (Welsh 2013). Despite the current chairperson's obvious efforts, it would seem that not all residents' needs are taken into account in the present case.

Our analysis rested at first on a static rigid framework, identifying the components making up vulnerability, but gained in dynamism as interlinkages were drawn between these components, linking assets towards feasible or un-feasible household and community initiatives, and towards coping and adaptive capacities. Human assets for instance play an important role, not all residents are fighting and try to change their lot, therefore lacking individual characteristics paramount to the "process of adapting to diverse circumstances" (Manyena 2006, p. 439). But households' adaptive and coping capacities are greatly dependent on power relations within the settlement. Viewing a community as a 'network of households', community level processes can be beneficial for coping capacity, as solidarity occurs to some extent, with the pooling and redistribution of assets. Moreover, how united a community is shapes adaptive capacity: a stable cohesive community is more likely to take action, address problems and bring about innovation than when processes are slowed down by internal fights and corruption. Both processes can coexist, as shown in the present case. On the one hand, the current leadership structure plays a key coordinating and monitoring role. But social community structures also lower households' coping and adaptive capacities. Leadership tensions especially challenge social cohesion; initiatives' feasibility is decreased as internal tensions derail processes. We can thus fall in line with community resilience discussions which note that "that a collection of resilient individuals does not guarantee a resilient community" (Norris 2008, p. 128). Households can achieve more together, they can also achieve less.

Being oblivious to the resilience approach, our analysis of flood risk in Sweet Home could very well have limited itself to capturing biophysical processes – and as a result, asked for

the implementation of 'hard' physical measures only. Now, looking at the community through the lens of resilience, our account was holistic and captured socioeconomic processes leading to vulnerability as well. Yet, this first empirical chapter also points to the short-sightedness of looking at *community* resilience only. As Welsh (2013, p. 6) points out, such approaches often "operate on the normative assumption that communities can and should self-organize to deal with uncertainty". Davoudi (2012, p. 305) goes as far as stating that resilience scholars over-emphasizing the role played by individuals and communities, and down-playing governments and state institutions, are guilty of a "misguided translation of self-organization in ecological systems into self-reliance in social systems". At present, the conclusion that Sweet Home's residents do presently not dispose of assets at household nor community level to cope, and face many internal difficulties when trying to adapt, leads us to a dead-end where not much can be done. An important point, however, is that residents need not tackle these issues all by themselves. That is especially the case in an urban context, where local governments play a major role mediating the "space between global abstract forces and everyday lived space" (Lefebvre 1974, cited in Kennedy 2011, p. 5). As opposed to rural areas, where it is perhaps more justified to draw a quasi-impermeable boundary around studied communities, it is urban local governments which navigate pressures originating at various scales, thus co-shaping the livelihoods of urban dwellers.

Sweet Home's chairperson (2013) aptly summarizes the situation:

"We wish there is a lot we could do ourselves, but we do not have the resources to do things on our own. All we can do is to cry out to the government and tell them about the problems affecting us."

The question now is, do "the government" and other external stakeholders hear this cry for help, are they of support in increasing Sweet Home's coping and adaptive capacity?

RESILIENCE FROM A GOVERNANCE PERSPECTIVE

Theoretical framework to capture efforts of external stakeholders

We go forth with our analysis extending the boundaries of the socio-ecological system from Sweet Home informal settlement itself to include also the stakeholders which play a role in shaping the resilience of the community. The socio-ecological system is then less understood in spatial terms, and more in a functional sense. The differentiation between the internal and external spheres still applies, but the external stakeholders bringing in their assets within a wider urban governance network form integral part of the socio-ecological system. The word 'stakeholders' then also takes its full meaning. The stakeholders which are considered as part of the system do not necessarily live within the physically delimitated area that forms the unit of interest, they are not the direct risk-bearers of the floods. But they have a *stake* in the ability of those who live within that unit to cope and proactively adapt to external disturbances. This stake manifests itself for various reasons, ranging from legal obligation in the case of local government, to a sense of moral obligation in the case of most CSOs. Let us now specify what 'resilience' means in relation to this re-defined socio-ecological system.

Resilience and governance

Resilience has rapidly established itself as an important urban policy discourse over the last few years (Evans 2011; Davoudi et al. 2012, p. 300). This discourse takes the normative stance that governance processes and institutions should foster the resilience of the socio-ecological systems they govern, managing its capacity to cope with and adapt to change (Berkes et al. 2003; Smit and Wandel 2006). Yet, quite provokingly, Davoudi (2007, p. 299) states that "it is not quite clear what resilience means, beyond the simple assumption that it is good to be resilient". Scholars of the opinion that resilience is just another buzzword are numerous (Xu and Marinova 2013; Welsh 2013, p.2). We understand that criticism, not in relation to resilience at large, but with regards to governance debates. Too often, policy-oriented (and some academic) documents on resilience limit themselves to tying up resilience to an important amount of well-sounding words, such as 'flexible', 'redundant', 'proactive', 'dynamic', 'innovative', frequently without even defining them (cf. for instance an inventory of conceptualizations of resilience made by Bahadur et al. 2010; Manyena 2006; Norris et al. 2007). How useful that is in practice can be questioned - 'let us be dynamic!' hardly provides a plan of action. Instead, we propose here to shape our conceptualization of resilience not around the adjectives which can qualify a system once it is resilient, but on its structure and inner workings.

Walker and Salt (2006) provide the starting point for that structure. They highlight three dimensions characterizing a governance system conducive to resilience: (1) diversity, of people and institutions, thus also of functions and responses, (2) modularity, i.e. linkages between the components of the system, and (3) tightness of feedbacks, referring to "how quickly and strongly the consequences of a change in one part of the system are felt and responded to in other parts" (Walker and Salt 2006, cited in Pisano 2012, p. 30). We leave that third dimension aside, as it refers to a quality of the system once it is resilient, not to its structure.

As with the vulnerability framework before, we can once more approach this typology through the lens of assets. First, diversity refers to the variety of assets present within the socio-ecological system. If many diverse stakeholders are involved in the flood risk governance system, they bring in assets which can be of support to the community at risk. This holds true both in a quantitative sense (e.g. more stakeholders can bring in larger amounts of funding), and in a qualitative sense (e.g. a local government has different capabilities than a CSO for instance). Second, modularity, or linkages between stakeholders, enables the exchange of those assets. The system is flexible in the sense that assets are mobile and can be transferred to those who need it, re-organization takes place. The modularity is what we study when looking at initiatives implemented by external stakeholders and their valuation: which assets are exchanged, to which effect. From this perspective, the governance system enables the community to absorb the disturbances caused by flooding if it disposes of the asset which can strengthen the community (diversity), and of channels to transfer those to the community (modularity). An optimum level of redundancy is instrumental in fostering resilience (Berkes et al. 2003). Indeed, if similar transfers of assets are carried out by different stakeholders, the failure of one initiative will not leave the problem completely untackled. Yet, redundancy and diversity should not be so high that initiatives disturb one another.

When the two dimensions are present (cf. figure 19), the socio-ecological system would have the capacity to flexibly exchange assets present within the system to address specific problem areas, proactively and reactively, so that the system would have the capacity "to alter non-essential attributes", here the location of assets within the system, "in order to survive" (Manyena 2006, p. 439).

(1) An external stakeholder bringing in its own assets

(2) Linkages over which assets can be exchanged, i.e. initiatives take place

vulnerable community

End result:

The effective and feasible transfer of assets before, during and after the system is confronted to the unexpected

Figure 19: A resilient socio-ecological system from a governance perspective. Source: Author 2013

Governance for resilience in Sweet Home

As visible on the figure below, a variety of stakeholders were identified as involved in governing flood risk in Sweet Home.

Centrally involved CCT Departments: DRMC,Informal Settlements, Environmental Health, TRS, Solid Waste, Water and Sanitation; Electricity; Law Enforcement Unit

In the community: Residents, community groups (such as savings groups or faith based institutions), informal leadership structures

CCT stakeholders belonging to the political realm: Mayor, City Council, Sub-council, Ward councilor

Civil Society Organizations: *Mustadafin Foundation; South African National Zakah Fund; The Warehouse; Red Cross Society of South Africa, Jungle Theatre; Ubuale Bakha Ubuhle*

Private sector stakeholders: Private donors (mainly retailers); weather forecasting offices; the media; private companies to which the CCT has outsourced tasks; care givers; ESKOM

Figure 20: Stakeholders involved in increasing resilience to flood risk in Sweet Home, according to our respondents. Source: Author 2013, also adapted from FliCCR 2010-2013

The table makes apparent that these include stakeholders outside of our circle of respondents, for instance the CSO *South African National Zakah Fund*, or private retail companies. Additional stakeholders which are involved but not listed on the figure count academia (whose initiatives will be the object of the third empirical chapter) and government institutions at provincial and national level (which lie outside of the scope of our study). Yet, it should be mentioned that the *Western Cape Government* comes into play by funding health care and affecting the land ownership situation, and that the *South African Government* supports socioeconomically vulnerable residents financially through state grants allocated by the *South African Social Security Agency*.

Presentation of the diversity of stakeholders

The point was already made in the contextual chapter, but deserves to be reiterated here: the CCT is not one, but rather constituted by a multitude of councils, directorates, departments. The main mandate of the six departments assessed as centrally involved in increasing resilience to flooding are specified in table 4.

Table 4: Main tasks of CCT departments

CCT department	Main tasks relating to increasing resilience to flooding
DRMC, in particular the *Flood and Storms Task Team*	Coordinate departments and CSOs all along the disaster risk continuum (from the developing of risk reduction strategies for high-priority informal settlements at risk from flooding to the coordination of DRMC volunteers reacting to emergency calls, over awareness raising activities)
Informal Settlements	Organize temporary relocation of residents, distribute flood relief kits, trauma counselling (Engineering branch of Human settlements plans for infrastructure)
Transport, Roads and Stormwater	Build infrastructure, maintain roads and stormwater channels
Water and Sanitation	Build infrastructure, maintain ablution blocks and water and sewage channels
Solid Waste Management	Keep the settlement free of solid/bulk waste
Environmental Health	Monitoring and awareness raising
Electricity	Repair the electricity connections
Law enforcement Unit	React to emergency calls
Environmental Resource Management	Coordinate awareness raising activities

While three CCT departments, namely Water and Sanitation, TRS and Solid Waste, are responsible with keeping the settlement clean and maintaining infrastructure, the tasks themselves are mostly carried out by external contractors, one for each department. Moreover, these contractors are liable to employ residents through the Extended Public Works Program (EPWP). The EPWP is a national policy implemented by the CCT, providing short-term employment for residents to carry out work directly within their community. The department of Environmental Health is tasked with constantly monitoring services, residents' health status, flood risk and flood impacts in settlements, then "putting pressure" on other departments to address identified problems (Environmental Health official 2013).

At various administrative and geographical levels, Mayor, council, sub-council and ward councilors oversee CCT departments (councilor 2013). They give instructions on the development and implementation of the large amount of policies which can be linked back to resilience to flood risk, as we have defined it: concerning capital investments on infrastructure, service delivery and maintenance in informal settlements, residents levels of education and awareness, flood relief. Albeit preparedness at a local level is generally recognized as crucial, there is no ward level disaster plan (councilor 2013). Ward councilors' initiatives surrounding flooding are thus at their own discretion. For ward 80 and Sweet Home, this has profound consequences. This is the case during a flood event, when the ward councilor fails at monitoring the situation and mobilizing external support, but also concerning resource allocation and long-term plans addressing internal vulnerability factors (Sweet Home residents 2013; DRMC official 2013). The following statement by a councilor (2013) sheds further light on the situation:

> "I think the ward councilor.. who's my friend.. who's my colleague. We're from different parties.. but when it comes to service delivery.. it's.. politics.. […] Because I can see his action on the sub-council is not so active. In his ward, in-fighting for his… or not 'fighting'… but.. demanding what is right for his people in his ward, I think the problem is him. He don't want to go and work in the areas. […] what I've discovered [in informal settlements] was.. the politicians is… 'ah, that's not my [Voting District].. you don't vote so much for me.. I got only 20% of your vote, so you're not important. I'm more worried about 80% of the vote. For instance when we have a sub-council meeting, we call it an activity day. Then we will ask him [ward councilor] what is the challenges in the ward [80]. Then he will say 'no! I must.. uhh… electricity..' you see. But that's in the pipeline already. That's on his program. So what other thing? He's got none.. ." (DA councilor, 2013).

The quote also highlights the extent to which the ward councilor's actions, or rather lack thereof, are dictated by political calculations. He, as an ANC member, does not work with a community in which an ANC chairperson was put down. As is the case at various governance

levels in South Africa, the community is hostage of political agenda which derail local priorities (Zuern 2011, p. 7).

According to respondents, a total of six CSOs are active in Sweet Home to deal with flood risk. The *South African National Zakah Fund* as well as the *Red Cross Society of South Africa* are primarily relief organizations which come into play once activated by DRMC. They distribute blankets and soup at the community hall, hand out one pair of bedding and food parcel per impacted household, and are involved in the additional distribution of two meals a day if needed. The distributed goods are funded by the CCT and/or donors from the private sector and civil society. The same applies to the *Mustadafin Foundation*. However, the latter is also present in Sweet Home all year round, with the daily distribution of food to those residents that are most in need. While risk reduction is only one of their missions, they do their best to foster synergies:

> "it's related to our feeding projects as well. […] So what we then do is run regular awareness programs in the queues of our feeding schemes. So that people who are there to come and collect food, they're also a captive audience. And they… it's an opportunity to engage with them. We engage with them not only with regards to reducing disaster risks around fire and flooding. But we also do so around health care, and how they are managing their health.. around finances.. " (member of the *Mustadafin Foundation* 2013).

The *Warehouse* is a local Anglican CSO which had direct ties to the settlement, the current chairperson and his wife being former members of the organization. A truck would bring blankets, soup and porridge when the organization was notified by the leadership. The *Warehouse* is further present in the community by running a soccer club for children and visits by a Community Evangelical Health club. Whether these initiatives will carry on was unclear at the time of fieldwork, as the chairperson and his wife are now devoting their time to the CSO *Ubuale Bakha Ubuhle,* recently co-founded together with a British national. That CSO is even more grounded in the community, its flagship project currently in the planning phase being 'sandbag houses'. That project consists in the upgrading of shacks into two-story houses with a cement foundation and walls solidified with sandbags to be produced by local labor. Finally, the *Jungle Theatre* is a company engaged by DRMC to transfer key messages on flooding to informal settlement communities. The resulting initiative is the interactive play 'the Spirit of Water', acted out in Sweet Home before each winter season since 2011.

Stakeholders from the private sector have a supporting function. Some enter the flood governance structure punctually. The media influence awareness levels, sometimes relaying messages from CSOs or the CCT following press briefings. Retailers donate goods to CSOs when a major flood event occurs, thus also improving their image (member of the

Mustadafin Foundation 2013). In addition to the private companies to which the CCT outsourced tasks, three other private stakeholders play a more substantial role: weather forecasting offices which directly alert the *Task Team,* care givers, and the semi-public electricity company ESKOM.

A diversity of assets

All these stakeholders bring assets into the socio-ecological system in its wider sense. Which assets exactly will be detailed in two steps. First, focusing on human assets, then detailing the more tangible bundle of financial and material assets. Beforehand, let us however stress the following. External stakeholders are unable to contribute the most crucial natural asset:

> "Land is the same dilemma, year after year" (DRMC official 2013).

Because of a shortage of land[22] on which the CCT could increase the offer of accessible formal housing and services, as well as the massive in-migration and uncontrolled urbanization rates faced by the CCT, the probability for the initiative which would solve the problem in the view of all respondents (residents, CCT officials, politicians and CSO workers alike-2013), is close to zero. Residents cannot be relocated to an environment which is biophysically less flood prone in the foreseeable future.

Human assets

Quite simply, more stakeholders equal more individuals coming in with their talents and ideas. The resilience literature underlines the importance of innovative leaders, champions who "reconceptualize issues; generate and integrate a diversity of ideas, viewpoints, and solutions; communicate and engage with key individuals in different sectors, [and] move across levels of governance and politics" (Anderies et al. 2006, p. 26). According to our own assessment but also as voiced by some respondents, those leaders are especially well represented within the *Flood and Storms Task Team*, within the department of Environmental Health, and within CSOs. A councilor for instance pointed to the role of key leaders within the *Task Team*,

> "who want to learn, want to be creative, want to change things, who listen to the community".

The *Task Team* was nearly always named unprompted, and always very highly valued, by all respondents from the CCT and CSOs. This is also reflected by the 35 South African municipal delegations that visited Cape Town to learn about the CCT's disaster risk management approach, "just to see how we tick" (DA councilor 2013).

---

[22] Many shacks are currently built on land which does not belong to the CCT, or on which is it legally not allowed to build services (e.g. road reserves).

Environmental Health´s high level of innovation manifests itself through extensive collection and analysis of data (including development of specific indicators, long-term trend analysis and spatial analysis), as well as constant reviewing of activities. Environmental Health officials (2013) assigned their success to flexibility. This flexibility is due to their position in the CCT, granting them independence in budgeting and offices close to communities, but is also core to their own approach:

> "It's no use planning all and then doing. You have to plan, do and review all the time".

Environmental Health is also innovative in how it makes the most of few resources. Being the only officials regularly interacting with residents does put them in a situation where they are "not popular with anybody", stuck "between a rock and a hard place", between other CCT departments whom they constantly have to report their failures to, and residents whom they cannot support directly.

> "We haven't got the means, the authority or anything to change their [residents'] situation. […] We always remind each other not to make any promises to the people […] But if I can say one thing, it is sometimes quite amazing what we get out of the limited resources we have [laughs, others nod]. We have to be very creative" (Environmental Health official 2013).

CSOs bring in many enthusiastic and passionate people. According to a member of the CSO *Mustadafin Foundation* (2013),

> "maybe it's because you really have to choose if you want to be in the [CSO] sector. Whereas if you work in government you might have other motivations.. maybe security and upward mobility".

Environmental Health being innovative

The 'squeezy bottle', showcased on the picture below, perfectly encapsulates what can be achieved out of "limited resources". Consisting only of a recycled bottle and a rubber straw (an investment of ZAR2.50, or about 25 euro cents), the device is one of those "realistic and applicable little ideas" implementable within household means. It enables residents to wash their hands without contaminating water and without having to walk to the tap every time. Water is also saved by the same occasion. The Environmental Health officials (2013) relate how, when they first proposed the idea, other officials laughed at the idea, stating that alcohol disinfectant was the only effective solution. Five years later, officials come back to ask why the diarrhoea figures decreased so dramatically. "We tell them, it's the squeezy bottle! [general laughter]".

Source: FliCCR 2013

What drives CSO members is mostly their will to make a difference in people's lives, as we could witness when interacting with passionate individuals, be it from the *Mustadafin Foundation*, the *Jungle Theatre*, or *Ubuale Bakha Ubuhle*. CCT officials and politicians recognized the "fantastic contribution" made by CSOs when it comes to flood prevention and relief (DRMC official 2013), highlighting their ability to collect funds from the private sector, and to mobilize volunteers. The skills of CSOs also help to facilitate stakeholder buy-in.

Still, shortcomings remain. The following quote from a CCT official (2013) with regards to Winter Preparedness Plans hints that the CCT's present DRR approach is not really solving issues:

> "It's like, the same problem, we're telling about it over and over and over. That's what it amounts to."

Innovation is sometimes hampered by external stakeholders, mostly CCT officials, who want to stay in their comfort zone:

> "coming up with a new idea doesn't always appeal to everybody. It's just extra work […]. The drawback is that often these problems have been going on for so long, that people are comfortable dealing with it the way they have always dealt with it" (member of the *Mustadafin Foundation* 2013).

Financial and material assets

Implementing these innovative ideas is not only difficult as some stakeholders block the movement forward. Lack of a more proactive approach, for instance implementation of initiatives addressing waste blockages, can also be traced back to a shortage of financial assets:

> "In an ideal world there are proactive things and reactive things that can be done. Proactive measures are easy in concept, departments […] just have to clean more, but that is an issue of budget" (TRS official 2010).[23]

Another TRS official (2013) states that costs is often why a solution cannot be implemented. Funding, just like infrastructure, is mainly brought in by the CCT. CSOs do not dispose of many material assets, do however contribute financial assets by mobilizing the private sector and collecting donations. Still, these funds are negligible in comparison to the billions of ZAR invested by the CCT every year. A DA councilor (2013) details the CCT's funding mechanisms:

---

[23] This quote is not a word to word transcription of the respondent's statements.

"the ward allocations. That is money that is given by the City to ward councilors and PR councilors to use in the community. But it's always cosmetic, it's for little things. […] the City's <u>big</u> budget is really designed to allocate things like infrastructure and ensuring that it doesn't flood. And there are millions and thousands of rands that are put out there. […] there is also just so much money that the City has."

Several CCT officials and CSO members pointed to the need of further involving the private sector when it comes to fund flood risk reduction and relief efforts. For instance, one DRMC official states (2013):

"I sometimes feel that the private sector needs to get more involved, man. That's my thing. These big conglomerates that's got deep pockets. Their social responsibility.. they have a social responsibility".

At present, departments remain under-resourced. This results in the inability to make certain investments, for instance in material assets, but also in departments being spread too thinly geographically. Moreover, as another consequence of insufficient funding, CCT departments represented on the *Task Team* are largely understaffed. Many officials described in interviews how they have to work long hours or spend most of the day travelling from one end of Cape Town to another, because they lack the human resources to delegate. This shortage in capacities becomes especially salient as working in informal settlements necessitates even more resources, for instance when carrying out awareness raising initiatives:

"With communities it's very difficult because you can't go into a community and do a program. You have to first get the community leaders involved, the councilor, the street committees, the sub-council, the ward council. […]With communities no, it's a loooong kind of lead process before you can actually go in and do the intervention. So it's not balanced enough because of the time, and we don't always have the capacity" (Environmental Resource Management official 2013).

An Environmental Health official (2013) reinforces the point:

"In our case, the resources are stretched to the limit."

Lack of finances reflects on the material assets at disposition in the socio-ecological system. The major asset brought in by CCT departments, especially in comparison to what CSOs and residents are able to contribute on that level, is infrastructure: pumping, sewage and waste trucks, drainage and sewage pipes, water taps, and many more. These assets are very important, especially as they enable to tackle biophysical vulnerability factors through large-scale structural initiatives (DRMC official 2013).

Modularity

Recalling the various vulnerability factors eventually leading to flood risk in Sweet Home, it becomes clear that flood risk can and should be addressed through many different ways, tackling both biophysical and socioeconomic factors and involving a variety of external stakeholders. Taking a resilience, thus holistic, approach, various initiatives, listed on figure 21 next to the colored blocks, could be implemented to tackle flood risk in C section .[24]
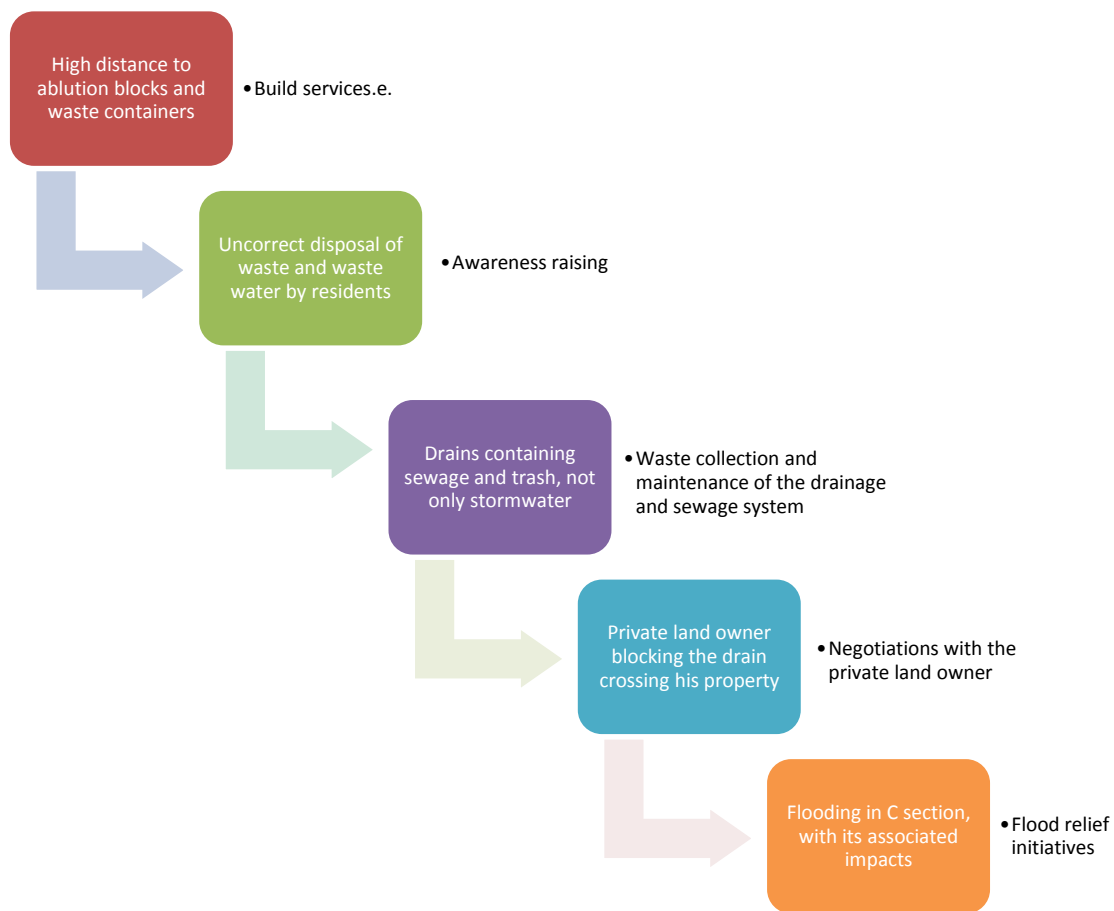
Figure 21: Causal chain of vulnerability factors leading to the flood hotspot in section C, and initiatives to tackle them.
Source: Author 2013

As an entire chapter could not do justice to a detailed description of all assets transferred within the studied socio-ecological system, we will only elaborate on the initiative types listed on fig. 21. Three detailed tables, putting in parallel all conceptual problem areas identified in Sweet Home with a list of external stakeholders' initiatives addressing each problem area, can be found in the appendix. An important message conveyed via the tables is that, with the exception of political disputes between community leaders and with the ward councilor, efforts are underway to tackle all problem areas. We counted 17 initiatives

---

[24] The causal chain was put together by the author, based on interview findings and a causal flowchart exercise carried out with a group of female residents.

addressing internal biophysical factors, 14 initiatives addressing internal socioeconomic factors, and 13 initiatives addressing flood impacts. Some initiatives bear more fruits than others. The problem area of increased criminality when the settlement is flooded, for instance, is only superficially tackled through ad hoc patrols from the CCT's Law Enforcement Unit. The issue of risky shack construction practices is yet to be addressed in practice through the sand-bag house project just launched by the CSO *Ubuale Bakha Ubuhle*.

Building of services

To tackle flood risk in C section at its very root, more ablution blocks, drainage and sewage infrastructure should be built in the settlement – i.e., a transfer of material assets. A major factors influencing to which extent material assets can be transferred from CCT departments to the community are funding, but also the local procurement system and local specificities.

Concerning funding, a DA councilor (so hardly unbiased, even if he only joined the DA very recently and has a strong 'community background'), states

> "Let me tell you, this City of Cape Town is pro-poor. And I was also a little bit sceptic about it, but when I sit in council now.. and I can honestly say… we are working for.. we are pro-poor. Coz most of the budget is going to the poor."

Indeed, when studying the CCT's total budget for 2013/2014 (de Lille 2013a), it appears that large portions are directed towards poorer areas, with provision of free basic services for households with a gross monthly income of ZAR3,000 or below, and 11.17 billion out of the 19.6 billion ZAR allocated for total service provision (i.e. for refuse, sanitation, water, electricity) spend in informal settlements.

To which areas capital investments (constituting 17.24% of the total budget, for instance in the form of new infrastructure) are directed to is not specified. Currently, material assets are insufficiently present in informal settlements, or in a poor state:

> "The challenge is the infrastructure, in the informal settlement we don't have the infrastructure, the capacity of the drains to deal with the floods. It's so very poor"
> (DA councilor 2013).

In the case of Sweet Home, many investments are yet to be made. Fig. 22 shows that in comparison to adjacent formal areas, the coverage of the bulkwater, sewage and reticulation system (open drains) is scarce in Sweet Home informal settlement. One highly possible explanation is the lack of dedication of Sweet Home's ward councilor.
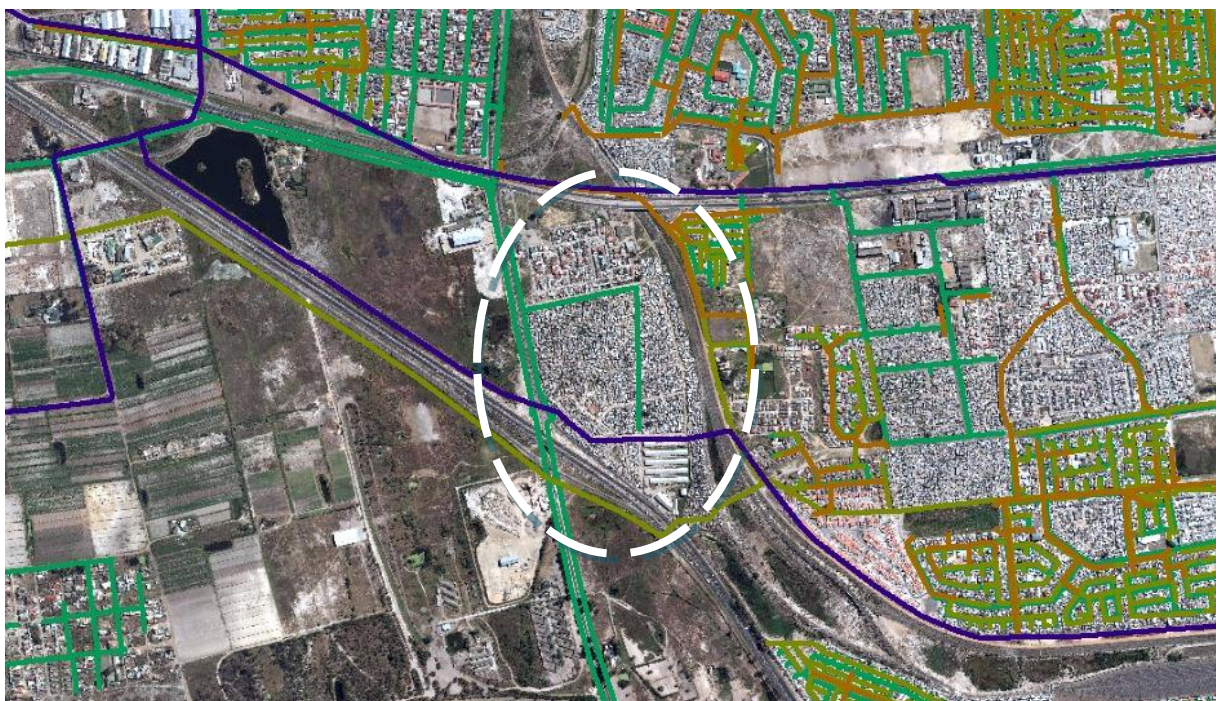
Figure 22: Bulkwater (dark blue), sewage (kaki), stormwater (brown) and reticulation (light green) in Sweet Home (in the white dotted lines) and surroundings. Source: CCT 2013e

In addition, local conditions, in fact internal biophysical vulnerability factors themselves, make it difficult to downright impossible to extend the drainage and sewage system. Concerning the building of additional taps, into which waste water could amongst others be poured:

> "now one might say, why don't you put taps in here [pointing at areas in the unserviced land that are right in the middle, without taps]. As I said, this is a formal landfill site. So the saturation is so bad. So if you have no infrastructure. Stormwater or sewerage infrastructure. What happens to the greywater? You can't just put standpipes all over the show. Coz then you're actually causing more problems there than solving the problems" (Water and Sanitation officials 2013).

The high shack density also hampers the building of additional infrastructure, because people would have to be relocated to make room for facilities, and because trucks to service facilities could not drive through. According to the same official,

> "your biggest problem here.. [*unserviced private land*]. This is your densest area. And you can only put toilets on the tracks where the service provider can get to it. Inside here, what can you do here? Nothing."

Awareness raising

Bringing back to mind the specifics of the C section flooding hotspot, changing residents' behavior when it comes to waste disposal is paramount. If waste water is poured into the taps build to this purpose, solid waste put into refuse bags in containers, the drains will not be blocked and filled with smelly greywater, and the private land owner might let excess (clean) storm water exit the settlements via his property. But awareness raising, a transfer of human capital from external stakeholders towards residents, does not only address the issue of waste disposal. The campaigns touch on various topics, for instance: how to contact the CCT in case of an emergency or when drains are blocked, how flooding and health hazards can be prevented (use of services, children's behavior), how to act in case of flooding. Overarching topics conducive to resilience, such as how to save money at household level or keep your place clean, are also addressed by CSOs. The overall aim is thus to increase residents' adaptive capacity. Through awareness raising activities, external stakeholders transfer human assets so that residents can help themselves:

> "It's not kits [that we give to residents] no, it's to make people aware and prepared. So it's a little kind of fact-sheet thingy saying 'to prepare yourself you need to have the following'. So [DRMC] don't give them the kit, they give the information to build together a kit. So that's a massive campaign that they run annually" (Environmental Resource Management official, 2013).

For once, initiatives implemented by external stakeholders are redundant when it comes to address residents' low levels of awareness. Redundancy is especially valuable when it comes to changing people's behaviors, as put by a member of the *Mustadafin Foundation* (2013):

> "coming from an education background myself. I know the importance of repetition […] *there's got to be more than one medium*".

Different CCT departments and CSOs implement programs using various channels, such as door-to-door pamphleting, stickers with emergency numbers pasted on public facilities, theatre plays, community meetings and health and hygiene projects organized by Environmental Health. Sometimes, residents are addressed indirectly, for instance when DRMC organizes press conferences to brief the media, which will relay the messages via their own routes, or when the Mustadafin Foundation develops cartoons on flooding, to be printed in major tabloids. Although awareness raising initiatives had to be prompted in most cases, overall they ranked high in effectiveness, even among departments such as TRS and Water and Sanitation, which mostly engage in technical issues.

Awareness raising initiatives were also highly valued because assessed as innovative. This applies to the 'community hand-overs' organized by Environmental Health. Once a toilet has been built, or fully repaired, the Environmental Health Practitioner responsible for the

district would 'hand over' the toilet to the adjacent households now responsible for caring for it. This has shown its fruits, the need for constant repairs decreased (Environmental Health CCT officials 2013).

Figures 23a and 23b: The various mediums used by the CCT uses to carry over their messages: Zibi the mascot of awareness campaigns on littering carried out by Solid Waste (on the left); a pamphlet put together by Environmental Health (on the right). Source: FliCCR 2013

Another extremely innovative awareness raising channel is the 45-minute play presented by the CSO *Jungle Theatre*. It is called the 'Spirit of Water' and is

> "'a typical Cape Town scenario [in which a] family moves from the Eastern Cape, during the summer period. And it looks perfect. And then they realize they're in a natural water course, when it rains. And then the play plays out the flooding scenario and.. why they are flooded […] And also going into the protective measures that they can put in place as a family. Raise your floor levels. Sandbags" (DRMC official 2013).

DRMC officials (2013) assessed the play as fun, lively and interactive, for instance when residents are asked to take out their phones and type in the emergency numbers during the representation. However, they also stated that the theatre company acting out the play is expensive, and that adults tend to find the "mickey mouse stuff" boring. According to a DRMC official (2013), adults are less appreciative, consider pamphlets as trash, their mindsets are more difficult to change than those of children. Similarly, an Environmental

Health official (2013) was disappointed by the turn-out at some of the health education events organized in Sweet Home.

Waste collection and maintenance of the drainage and sewage system

While contractors carry out the weekly waste collection and infrastructure maintenance tasks, the departments of Water and Sanitation, TRS and Solid Waste jump in for monitoring purposes and when specifically called by residents, for instance if a sofa blocks a drain, or if a storm water pipe is broken. As stated by a Solid Waste official (2013), the extent to which his department comes to the settlement to remove bulk waste and illegal dumping very much depends on availability of materials and funding. TRS on the other hand is usually proactive in paying particular attention to the drainage infrastructure before flood season:

> "usually this time now they [TRS] will very much focus on storm water channels, the storm water inlets, and drains and things like that, to clear it now, preparing for the winter season. And also, their programs, I know in Sweet Home they have carried out repairs on the storm water inlets there, and pumps and things like that. So everybody is now very much gearing up for the winter season" (Environmental Health official 2013).

These structural interventions were highly valued by external stakeholders; the answer of this DRMC official (2013) being quite representative of what respondents answered to the question 'which initiative makes the biggest difference concerning flooding?' [25]:

> "Solid Waste. Also. It's like fixing the taps. Roads and Stormwater. Also yeah. Coz that's what makes a difference. And that's what people can see… 'yeah. The City's coming and they're doing..' especially if it's a big engineering intervention where they can see the difference in terms of flood […]Coz it's hardcore stuff."

Some residents carry out the tasks themselves as part of the EPWP (cf. fig. 24). Additionally to taking care of the weekly removal of solid waste, of unblocking and cleaning the storm water and sewage system, of cleaning sanitation facilities and preventing greywater from entering storm water channels, socioeconomic vulnerability factors are addressed by the same token. The EPWP builds up residents' coping and adaptive capacity, providing wages, but also enhancing skills, self-esteem and enlarging the participants' social networks (Parnell et al. 2005). Financial, human and social assets are strengthened in the community.

---

[25] Three main answers were given to this question: first, collaboration and the Task Team; second, hard-core and engineering initiatives. The third type of answer reflected what should ideally be done: provide residents with proper housing, eradicate informal settlements.

Figure 24: EPWP works emptying a waste shipping container in Sweet Home. Source: FliCCR 2013

Negotiations with the private land owner

This paragraph is relatively short, as there is not much happening in Sweet Home to the effect of negotiating with the private land owner – an important finding in itself. A TRS official often present in Sweet Home for monitoring purposes, thus somebody who should be aware of local doings, stated that he did not know who exactly was responsible with resolving the blockage issue in C section (2013).

According to the chairperson's wife (2012), the chairperson had paid a visit to the land owner together with the Mayor, when the latter came into the settlement at the end of 2012. If any progress was made during that meeting is not clear.

Initiatives targeting flood impacts

Reactive initiatives can be categorized in two main groups. Firstly, those supporting residents' physical and mental well-being: CSOs engaged in trauma counseling, clinics and mobile clinics treating sick residents, and Informal Settlement officials (2010) coming in to provide "peace of mind" in the aftermath of a disaster. Secondly, there are initiatives of a more structural nature. For instance TRS providing sand so that residents can elevate the floor levels in their shacks, or bringing in a storm water pump which operates permanently in C section, discharging the water into the retention pond on the Western side of the settlement.

Again, DRMC and Environmental Health, together with the community leadership, play much of a coordinating role, monitoring which households are in need of which assets. On paper, the same should be said for the ward councilor, but cannot be stated in the case of Sweet Home. As in relation to biophysical vulnerability factors, the CCT plays the lead role

when it comes to implementing 'hard-core' initiatives or conducting dramatic rescue activities (cf. image below). CSOs mostly serve as channels to distribute assets funded by the CCT to residents: blankets and soup, bedding, food parcels, meals (CSO member 2013). While several CSOs are involved in flood relief in Cape Town, one cannot really talk of redundancy concerning the manner in which the identified flood impacts are tackled. The CCT assigns CSOs to specific areas.

Figure 25: A disaster response team in action in an informal settlement. Source: CCT 2013d

Overall, reactive interventions were classified into the category 'no change' by interviewed CCT officials, councilors and CSOs (2013), the main argument being that they only constitute quick-fixes. For instance, the sand provided by Informal Settlements washes away quickly, the problem of bad shack construction practices remains (DA councilor 2013). Flood relief kits containing materials for residents to improve their shacks (nails, plastic sails…) are also distributed by Informal Settlements but not viewed as particularly effective by officials from the same (2010) and other (2013) departments. Kits are expensive and do not always contain assets addressing the specific needs of residents. Moreover, only one kit is issued per household, and distribution provides opportunity for much corruption and mistrust.

A TRS official (2010) assessed the costs of CCT hand-outs (approximately half a million ZAR for plastic sheets to reactively cover shack roofs only) as low in comparison to other running costs[26]. A valuation which was not shared by a member of the CSO *Mustadafin Foundation* (2013), criticizing a resource allocation which in his view balances too much towards flood relief:

> "The City spends billions of rands every year. It cost the City last year, for just the one
> area, 27 million. And that was must in one area that they fed them six times… just for

---

[26] The repair and maintenance budget of TRS is around 100 million ZAR for one district only, about which 50 million are used to pay contractors for direct cleaning. The value of infrastructure is close to 15 billion. On capital, the investment is probably around 50 million per year (TRS official 2010).

feeding. And sandbags and all that. That 27 million could have bought how many houses. So if it's going to be ongoing that they have to supply relief every year instead of having a budget, building them proper housing. And they [are] not going to have that problem."

Temporary relocation, to the community hall or outside of the community, is another contentious issue managed by Informal Settlements and DRMC. As stated by a DA councilor (2013),

"people don't want to relocate. […] Because they say 'no, when we go out, that you gonna destroy our hut'. That is the thing. And when they relocated for.. and come back, their things is missing. So it's a lot of things that need to be managed."

Horizontal modularity: Exchange of assets between external stakeholders
It should by now be clear that modularity occurs not only from external stakeholders down to the community (what we term vertical modularity), but also between external stakeholders themselves (horizontal modularity).

Stakeholders pool their assets through various ways. For instance, CCT funds are complemented with private donations collected by CSOs, and CCT departments rely on CSOs' assets to transfer department hand-outs and information to residents. As stated by a Environmental Resource Management official (2013) coordinating awareness raising initiatives:

"I've got a 120 service providers that I work with. External people. Because we can't do it as city people alone, we need to work with… NGOs, CBOs, government, other government departments".[27]

The sandbag project, starting as a local CSO initiative, is another interesting case of several stakeholders working together. The funds for the houses are to be provided through community saving groups, some materials by CCT departments, with backing from sub-council. That this is the sole internal biophysical factors tackled by a CSO reflects a legal inhibition faced by the CCT: city departments are not allowed to spend public money on private property (TRS official 2010). The CSO thus comes in to fill that gap.

Within the CCT as well, financial and material assets have to be combined with human capital - knowledge on which infrastructure is needed where, present mainly in the engineering branch of the Human Settlements directorate:

---

[27] Most respodents use the abbreviation 'NGO' (non-governmental organization) in place of what we name 'CSOs'. "CBO" stands for community-based organization, referring to community groups.

> "[Human Settlements] give us the plan, we do the work. [*laughs*] that's what was done. Coz they haven't got the infrastructure to do it" (Water and Sanitation official 2013).

On a flexible basis, a department can support another department with their human and material assets. For instance Water and Sanitation field officials jumping in for the TRS department:

> "It's Roads and Stormwater [who should be in charge].. but [laughs].. it depends on whether they have the infrastructure. Unfortunately.. they have big plants and stuff, which they can't necessarily move around fast enough. So we would get involved.. because we've got small plant. [...] we've got people out in the field actually.. so they closer than maybe the Roads and Stormwater" (Water and Sanitation official 2013).

The described horizontal modularity can however also be viewed in a negative light. One can rarely talk of redundancy, meaning that if one initiative fails, another would still be present for damage control purposes. On the contrary, stakeholders often depend on one another to carry out an initiative; if one node fails, the entire problem area can remain untackled.

Valuation of external stakeholders' initiatives by residents

The extent to which residents witness initiatives of external stakeholders, and how they describe those, is a good overall indicator of how successful those initiatives are. Still, let us not forget that other factors might largely explain why initiatives are not cited by residents, or criticized. Those are among others low levels of education (e.g. not linking up an initiative such as waste collection to flood prevention), and the deliberate intention to picture the CCT in a negative light. Overall, 35% of residents[28] were quick at saying that nobody from outside their community was helping them in coping or adapting to flooding. For instance, one Sweet Home resident translates for another resident during an institutional mapping exercise (2013):

> "She doesn't get help from outside. She helps herself".

The same exercise showed that stakeholders within the community were assessed by residents as playing a more important role to manage flooding than external stakeholders.[29] When initiatives of external stakeholders were mentioned, those were mostly in the realm of reactive relief activities. For Sweet Home resident Balara (2013) for instance:

---

[28] Out of 16 individuals and one focus group with seven participants (so percentage calculated based on N=17).
[29] Only three of the eleven participants named external stakeholders, and prompting was needed to direct attention to institutions outside of the settlement.

"I notice that they bring the blankets.. the grey blankets to the community […] the City if they can help more. Because they just do something for that time, if they see [flooding]. So if the City can come and do more than they do now.. then the City can make it a better place for me".

Hand-outs distributed by CSOs and funded by the CCT alone constitute 17% of all initiatives named by residents, notwithstanding other relief activities carried out by CSOs and the CCT (cf. graph below).

Proportion of stakeholders

- Mainly the CCT — 56%
- Mainly CSOs — 25%
- CSOs (distribution) and CCT (funding) in the case of relief hand-outs — 17%
- South African Social Security Agency (SASSA) — 2%
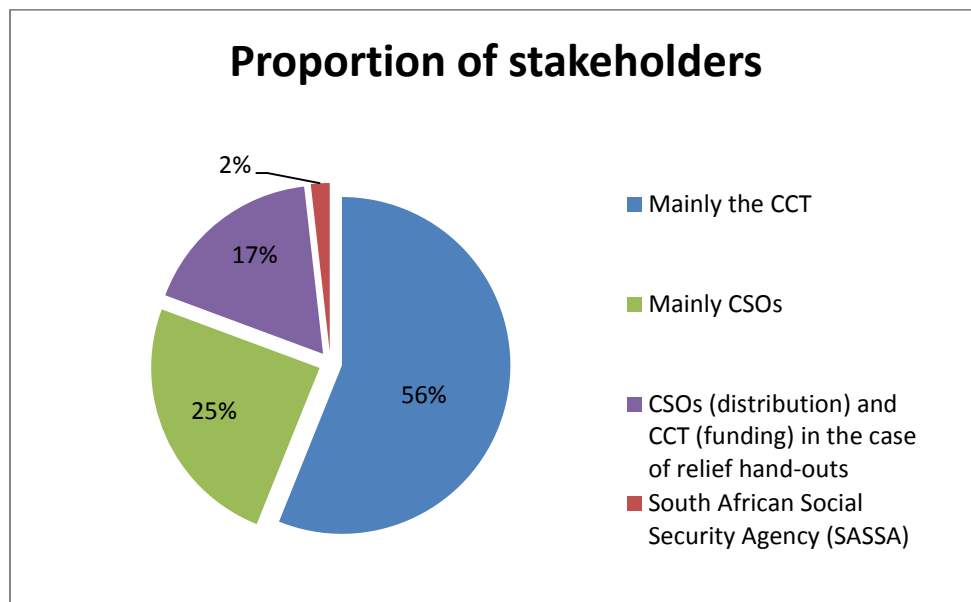
Figure 26: External stakeholders implementing initiatives, as cited by residents. Source: Author 2013

In the realm of relief activities, the DRMC's ability to respond to emergency calls was highly valued, response times assessed as short:

"they don't do the empty promises" (Sweet Home Chairperson 2013).

This does not apply to 'less spectacular' initiatives. In particular, residents raised their frustrations with relief handouts such as blankets. They complained that relief activities only address the symptoms, not the root causes. For instance, Aviwe (2013) stated that when she brings her child to the clinic after he caught rashes playing in the greywater, health practitioners always tell her that they cannot really help, because conditions in the settlement itself make residents sick.

There was a differentiation in valuation of hand-outs which are distributed once flooding happens, and long-term distribution of food and other goods. On the one hand, nearly all residents cited and welcomed the regular distribution of food 'from the Mosque' (i.e. *Mustadafin Foundation*), especially the most marginalized, the unemployed:

"The best is the food, because everybody is looking for food here in the squatter camp. […] Everybody that is not working. So that is the best for me" (Luxolo, Sweet Home resident 2013).

On the other hand, and for the community leadership (and CSOs) in particular, reactive emergency hand-outs were assessed negatively because creating a state of dependence.

"It makes people rely, so it's a bad change. Because there is the people they will say 'I wish it could be winter now, because I need that soup, I need that blanket'. See? […] Those people [stakeholders distributing relief hand-outs] they just come on that time of need, you see. These people [the CSO *The Warehouse*], they assisted the people to come out of that need" (Sweet Home Chairperson 2013).

Instead of being in a receiving positions, residents should be empowered and share responsibility. This will of people to "want more than simply to attain the minimum standards associated with coping" reflects that resilience is something they strive for as well (Manyena 2006, p. 446). Several other dimensions of resilience could be traced down in residents' statements. Here are two of such quotes by Sweet Home's chairperson (2013), the first highlighting the need for a holistic approach, the second for proactive and long-term plans:

"You can't put you in a problem because your aim is to gain at some point. Even if you're helping somebody you need to look full sight, not just in one side."

"I think the government should implement effective strategies to help us cope with the floods. For example, if they only give us a blanket, that will not help us because our shacks are flooded with water, and the provided blankets are not even warm. The government must fulfill its leadership role and perform its duties to serve people, not just provide minor gifts pretending to be helpful."

The last sentence in particular drives the point home. "Minor gifts" are seen as poor substitute for more proactive interventions which would directly tackle vulnerability factors. Amongst the rare occurrences of residents able to cite such proactive initiatives, the expressed sentiment is mainly that those do in effect not reduce flood risk either. Initiatives targeting biophysical vulnerability factors were cited less often than those targeting socioeconomic vulnerability factors – and that while those should be the initiatives "that people can see", as pointed out by a DRMC official before. Several residents stated that Sweet Home remains a dirty place notwithstanding the CCT's efforts to maintain services and clean drains:

"I see the workers here in [the] squatter camp clean those drains. But, they clean today, tomorrow do not clean, and then again the people is throwing the rubbish in there. So this place is not good, is bad" (Luxolo, Sweet Home resident, 2013).

Residents' frustration concerning the blocked drain in C section, and the lack of action to resolve the issue, was high. Concerning the ward councillor specifically:

"We called him, and he didn't come. So we don't know where we can report. Because he's the one who's supposed to be responsible, and take the matters of Sweet Home up… " (Donna, Sweet Home resident 2013).

On initiatives targeting socioeconomic vulnerability factors, valuation of CSO initiatives is more positive than of CCT initiatives. That might be, as already mentioned, because some CSOs distribute goods all year over, but also because some CSO initiatives have in essence a deeper more lasting effect, for instance strengthening social ties between residents by organizing community activities such as the soccer club and group excursions. What is especially interesting is that such initiatives, described positively by residents, were not brought up by CCT officials at all. Awareness raising initiatives on the other hand, so highly valued by CCT officials, could almost never be cited by residents, even after prompting. One resident, Margaret (2013), showed us a squeezy bottle that had been brought to her the week before. She had not used it yet though, because she was "busy". Most residents had never heard of the play or community health talks, or had not been able to attend because of work. Aviwe (Sweet Home resident, 2013) had seen a play, could not witness other present residents making particular arrangements after it though. In her view, this might also be because the play is shown just before the harshest winter months, when it is often too late to make arrangements. In general, residents discarded awareness raising activities, which they assess as repetitive and ridiculous in comparison to what they really need, such as houses, toilets, electricity, jobs:

"Are we going to be told this thing for the twenty years to come, how to clean the drain? We need some ways to…" (Ongama, Cape Flats resident 2013).

Conclusions

A diversity of CCT departments, CSOs and other external stakeholders bring in various assets. The *Task Team*, Environmental Health department and CSOs in particular contribute with key leaders which try, in fact, to mainstream resilience thinking within their organizations. Amongst others, the importance of proactive planning, of flexibility through constant adjusting of initiatives, as well as a holistic approach was voiced. However, this spirit of innovation loses some backwind as the CCT, only stakeholder capable of funding and

implementing large-scale structural initiatives, faces a shortage of financial assets coupled with insufficient material assets and manpower. Moreover, vulnerability factors as identified interacting with residents reappeared, sometimes being the reason why structural initiatives, such as building additional infrastructure, are not feasible.

Modularity, via the transfer of assets between stakeholders, does occur, taking various forms. Horizontal modularity consists of external stakeholders pooling assets to implement certain initiatives, within the *Task Team*, but also outside of the CCT. DRMC for instance provides the funding and input for awareness raising initiatives ultimately carried out by CSOs. Stakeholders complement each other. This further increases flexibility and the feasibility of initiatives, but can also constitute a disadvantage when stakeholders become dependent on each other. Vertical modularity aims to address conceptual problem areas in Sweet Home. An important finding is that one linkage which should be instrumental, namely the channeling of assets via the ward councilor, is missing. This converges with other studies demonstrating how the South African ward structures often fail at enhancing participatory democracy (*Islanda Institute* 2012).

Putting in parallel the internal vulnerability factors and flood impacts identified in the previous chapter with initiatives implemented by external stakeholders proved a valuable exercise. Broad patterns, such as the fact that efforts are underway to address all problem areas but one (the leadership tensions), and that some level of redundancy is present, should point towards an increase in the community's resilience. Framed as a transfer of assets, initiatives should increase adaptive capacity (e.g. as the Extended Public Works Program further extends the asset base of some residents, providing employment, skills and social contacts) and coping capacity (e.g. the punctual transfer of assets in the aftermath of a disaster, restoring residents' physical and psychological well-being).

Still, negative valuations of initiatives could be traced back within external stakeholders' statements, and are especially forceful coming from residents. The most striking ones are summarized in table 5.

Patterns in the valuations, but also in the perceptions of residents (which initiatives are named, which are witnessed on the ground) sometimes starkly depart from external stakeholders' descriptions. As pointed out by Canon and Müller-Mahn (2010, p. 625) priorities diverge among stakeholders. But convergences exist as well. CSO members and residents in particular agree that reactive initiatives do not contribute in solving the problem. Both external stakeholders and community members agree that the maintenance of infrastructure could be effective, if carried out properly. Most stakeholders agree that relocation, or in situ 'hard measures' are the solution, yet cannot be implemented.

Table 5: Notable divergences and convergences in the valuation of initiatives

Initiative	… from an assets perspective, initiative is a transfer of	Valuation of external stakeholders (officials, politicians, CSO members)	Valuation residents
Building services	material assets	would be highly effective, yet not feasible for technical/funding reasons	would be highly effective
Raising awareness	human assets	highly effective, even in the view of officials trained as engineers/technicians	not effective
Collecting waste and maintaining the infrastructure	material assets, as well as social, financial and human assets through EPWP	would be highly effective, yet not feasible because of residents behaviour	Not implemented to satisfaction at the moment EPWP welcomed though
Negotiating with the private land owner	employ social capital to increase social capital	would be highly effective, is it happening?	would be highly effective, is it happening?
Flood relief initiatives	material, human and social assets	moderately feasible, yet does not contribute in solving the problem (especially in view of CSO members and residents)	
Weekly distribution of food coupled to awareness raising	material, human and social assets	highly effective and feasible (with responsive audience) - YETnot mentionned by any official nor politician	highly effective (except when residents miss the distribution because they have to work)
Organization of community activities	social assets	highly effective - YET not mentionned by any official nor politician	highly effective
Relocation	transformation' of the socio-ecological system	currently not addressed - yet would be highly effective in view of all	
Poor shack structures	material assets		
Leadership tensions	social assets		

The collected valuations hint that lack of resilience is due to a combination of low effectiveness and feasibility of initiatives. The exchange of assets occurs, yet these assets are not always arriving at destination (low feasibility), or not effectively addressing root factors when they do. While diversity and modularity are present in Cape Town, there is a discrepancy between the extensive efforts and dedication we observed when interacting with CCT officials and CSO workers, and the stated changes residents witness on the ground. Empirical findings thus clearly underline that diversity and modularity are necessary, yet not sufficient, conditions, for a resilient governance system.

ADAPTIVE GOVERNANCE AND COLLABORATION[30]

Theoretical framework to capture adaptation processes

The last chapter concluded on a mismatch between external stakeholder's descriptions of initiatives, and what residents witness on the ground. It results that adjustments should be made. Adaptation of the governance system, modifying or changing "its characteristics or behaviour so as to cope better with existing or anticipated external stresses" (Brooks 2003, p. 9) is needed. Following our conceptualization, this translates in the need of changing the input of assets present within the system, as brought in by various stakeholders, and in changing the conditions within which they are transferred between stakeholders. Stakeholders already collaborate in the sense that assets are exchanged, pooled, sometimes channeled from one to another through a third party. However, this chapter stresses that these more superficial asset exchanges need to be nested within stronger and deeper rooted ties between stakeholders, and that barriers of various kinds currently lie between stakeholders. We make the case for a more restrictive definition of 'multi-stakeholder collaboration', and argue that were it implemented, it could play a central role in improving effectiveness and feasibility of initiatives in Cape Town.

Multi-stakeholder collaboration

Collaboration could be framed as modularity, albeit of a very specific type. We set three main criteria to be fulfilled before a linkage between stakeholders can earn the denomination 'collaborative'. First, collaboration is a flow of human and social capital which takes place through lasting relationships (Cowan and Arsenault 2008, p. 21) and generates in turn new knowledge and social capital (Pisano 2012, p. 29). It is therefore more profound and fruitful than a punctual and/or superficial exchange of funding or infrastructure. The pooling of knowledge results in more than the sum of its elements; it often holds the promise of creating something new. Second, collaboration differs from other types of engagement and communication because it embraces notions of multiple stakeholders coming together and working collectively towards a clearly defined common goal, as opposed to just supporting each other in reaching each one's goal (Lopez-Marrero and Tschakert 2001; Cowan and Arsenault 2008; Hardoy et al. 2011). Third, that same goal has not been decided on and enforced by one stakeholder only. Even if that is often difficult to achieve, stakeholders should define the problem, the goal as well as take decisions in consensus (Ansell and Gash 2007, p. 543). Collaborative projects thus take dialogue, that is two-way or multi-directional communication, one step further (Cowan and Arsenault 2008,

---

[30] An earlier version of this chapter was submitted as a paper written by I. Desportes, J. Waddell and M. Hordijk at the *ClimUrb International Workshop* in Manchester, September 2013, under the title "Improving flood risk governance through multi-stakeholder collaboration: a case study of Sweet Home informal settlement, Cape Town".

p. 21). One of their key outcomes is their ability to "breed social trust, foster norms of reciprocity, and create stores of goodwill that can prove invaluable during times of crisis", and that even across socio-political divides (Cowan and Arsenault 2008, p. 23).

Communities often have different priorities to the external stakeholders wishing to protect them from risks (Canon and Müller-Mahn 2010, p. 625), social learning therefore is a critical process to ensure stakeholders are able to inform each other of their understanding of risk, their unique needs (which assets would make a change, would be effective?), and priorities. If the problem is assessed holistically, taking into account different perceptions and different contextual singularities, blueprints are less likely to be carried out – a plus for resilience (Manyena 2006, p. 439). Drawing on the present study context, it is about both external stakeholders raising the awareness and knowledge of residents, and residents informing others of their needs.

Also, collaboration, by bringing stakeholders closer together, will increase feasibility. Diverse assets will not only be present in the socio-ecological system in the wider sense (diversity), and channels not only exist to exchange those assets (modularity). Owing to collaborative efforts, stakeholders can exchange assets quickly through the right channels. This fosters flexibility, a key characteristic to resilient systems (Bahadur et al. 2010). External stakeholders can closely monitor the impacts of asset exchanges, and thus constantly reflect on and adapt their initiatives if needed. Moreover, new knowledge is likely to lead to new action, thus innovation.

One notices the parallels between collaboration/social learning and external socioeconomic vulnerability factors. Collaboration is a manner to bridge the distance between the community and external stakeholders, most notably by shifting the center of decision-making closer to the people. But collaboration is also conducive to resilience as it helps to overcome barriers to resilient and adaptive governance.

Barriers to adaptation

The barriers to adaptation[31] framework developed by Ekstrom et al. (2011) is useful to identify "obstacles that delay, divert, or temporarily block the adaptation process, but which can be overcome with concerted effort, creative management, change of thinking, prioritization, and any related shifts in resources, land uses, or institutions" (Ekstrom et al. 2011, p. 1). We therefore include these barriers into our conceptual framework (cf. fig . 27).

---

[31] Although Ekstrom et al. (2011, p.1) focus on adaptation to climate change specifically, their definition of adaptation is broad enough for their framework to be of use to us. They state that adaptation consists of "changes in socio-ecological systems" (including shifts in governance arrangements) which result from "strategies and actions" ranging "from short-term coping to longer-term, deeper transformations". The definition thus encompasses the presently studied initiatives to cope and to adapt.
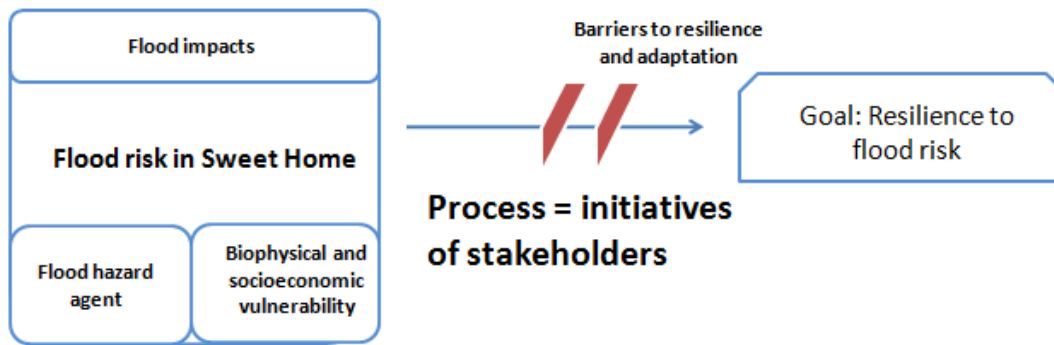
Figure 27: Conceptual framework as enriched by empirical findings. Source: Author 2013

It is interesting to note that multi-stakeholder collaboration, reflected in the aforementioned quote through the terms "concerted effort, creative management, change of thinking", is not only central because it helps in overcoming barriers. A lack of such collaboration itself constitutes and creates most of the barriers. Indeed, Ekstrom et al. (2011) argue that five main cross-cuttings barriers hamper governance efforts to adapt. Overall, the five barriers are:

1. *Resource barriers:* shortages of staff and required skills, the lack of capacities to carry out certain initiatives, and the lack of funding or funding mechanisms to support governance processes;

2. *Institutional and regulatory barriers:* the laws and formal structure (or lack of) in place, which can impede and delay governance processes;

3. *Cultural and behavioral barriers:* the way people might think about and define an issue, and the information and knowledge they value which shapes their perception;

4. *Participation and engagement barriers:* who is or is not allowed to participate, taking into account the logistics as well as the politics which might discourage active participation;

5. *Information and communication barriers:* absence of correct channels of communication, lack of information or information misinterpreted or inappropriately communicated.

Collaboration for adaptation in Cape Town

The *World Design Capital* title awarded to Cape Town for the year 2014 has put innovative out-of the box 'design thinking' high on the agenda of high-placed politicians and CCT officials. As stated by the two World Design Capital officials (2013), collaboration, defined by them as bringing multiple stakeholders and perspectives together, is central. They list voices

which usually do not get heard, yet can prove paramount in resolving specific problems in addition to CCT departments: "residents at household level, NGOs, [faith-based organizations], […] community organizations, universities". New solutions need to be found, as

> "today's issues are very different to the issues we dealt with in the past. We got these complex problems and these wicked problems. And yet, currently the solutions that we are employing […] were created for another era, for another time. […] You want to find the solution to a problem, and only the people [including residents] who are actively involved with that can contribute" (World Design Capital official 2013).

Collaboration as described and lived by respondents

It was astonishing how many statements of external stakeholders could be linked back to collaboration according to our restricted definition. Of course, year-long interaction of CCT officials with the Flooding in Cape Town under Climate Risk team (FliCCR), and collaboration being a fashionable topic in Cape Town since its bid for the World Design Capital title, might partly explain this keen interest. Still, respondents' pleas for collaboration were firmly set within descriptions of their own personal experiences and difficulties. For instance during a presentation held at a meeting with CCT officials from Environmental Health, where the speaker from that same department illustrated the complex puzzle of stakeholders which have to work together to address the service backlog and poor maintenance of infrastructure in Cape Town's informal settlements (cf. fig. 28).
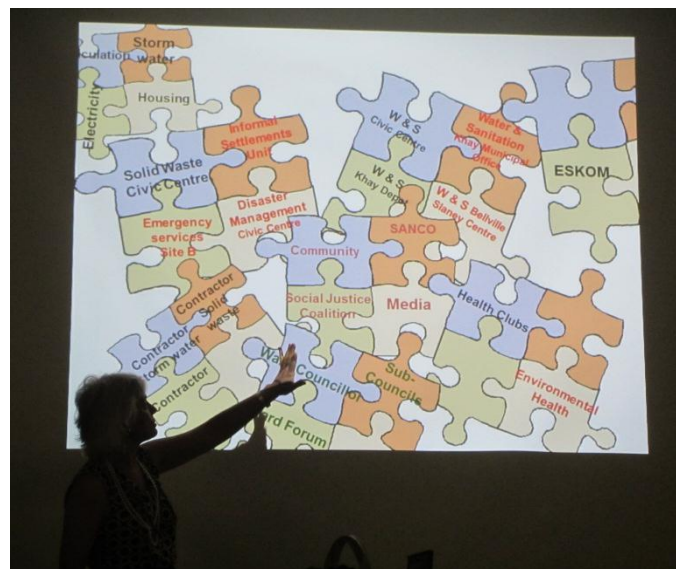

Figure 28: Presentation during a meeting with Environmental Health Practitioners in May 2013. Source: FliCCR 2013

According to an Environmental Health official (2013), social ties between stakeholders are primordial. The extent to which assets can be exchanged flexibly depends on

"how you work with the departments, and who you know as well. If you've got a good relationship with water and sanitation, then you can see, they give priority to address the problems" (Environmental Health official 2013).

The wish to unite forces to attain a common goal, echoing one of the collaboration criteria, was also expressed by respondents. The goal was often broadly defined, such as "the common good, the good cause" (DRMC official 2013), or, in the words of a member of the Mustadafin Foundation (2013):

"so I really just believe it's about partnership. And collaboration, you know, between NGOs, the community, the City, and corporates. […] I'm a firm believer that it takes us getting everybody who's got anything to do with the fact that this is our country… who's not invested? To step up and say, what can I do?"

Existing collaborative platforms within the City of Cape Town

The need for collaboration is not only reflected in respondents' statements. In practice, collaborative platforms have been flourishing within the CCT over the last few years. Those relating, directly or indirectly, to flood risk in informal settlements include the *Task Team* headed by DRMC, but also the *Environmental Education and Communication Forum* coordinated by Environmental Resource Management and the *Urbanization Forum* coordinated by Environmental Health. Each of these platforms are a space for various CCT departments to address a commonly identified problem together, namely flooding, low awareness levels and the service backlog respectively. The collaboration criteria of 'a common goal' is thus fulfilled. Moreover, the fora aim for more than just a pooling of material and financial assets to achieve that goal. The following quote underlines how the *Task Team* is a platform where exchange of knowledge takes place for consensus-oriented decision-making between departments:

"there's not just one approach. You have various approaches.. various experiences that you combine… and then all can combined make a decision. Then you'll accomplish more.. than just one department trying to do some… make a difference…" (Water and Sanitation official 2013)

"Various approaches" and "experiences", thus types of knowledge and information gathered through the perspective of separate departments, are "combined" to "make a decision". Also, a common understanding of the problem, and "interdepartmental" approach to solving that same problem, is fostered:

"we follow the integrated approach, so that we can be the eyes and the ears of every department. So that we [are] not isolated and say well, this is not our problem, and it's nothing to do with us" (Water and Sanitation official 2013).

"[At the Task Team] they look at the problem holistically. And they address the problem interdepartmentally. And that makes a big difference. And I think it's good because no line department can do it on their own. It's an integrated approach" (DA councillor 2013).

These quotes echo the two additional collaboration criteria: flows of knowledge (1) between (theoretically) equal partners (3). Similarly, another CCT official on the *Task Team*, this time based in DRMC (2013), compared the *Task Team* to a body, which cannot reach an optimal performance if all senses are not activated. Different senses are for instance combined during the pre-winter field visits with team members from different departments (Environmental Health official 2013). The *Task Team* seems to improve the feasibility of initiatives; problems are addressed, resources spread more equitably across space (DRMC 2013). According to an Environmental Health official (2013):

"funnily enough during the winter season, because of having this meeting [the task team meeting], you tend to get that things are addressed because all the directors and management are present."

Concerning the *Environmental Education and Communication Forum,* an official from DRMC (2013) points to the integration of the different messages departments wish to carry:

"We work with the other City services […] [on] a team, where reps from the various services, all to do with education and awareness… […] [we] integrate, so that we.. there's one message. And that we don't duplicate materials. And that we share our materials with each other. And that we join forces".

During the monthly *Urbanization Forum*, where Environmental Health practitioners report on the status of the informal settlements in their district, focusing on flooding in particular during the winter season, "partners" from other departments are "made aware" and can thus tackle the problem together (Environmental Health official 2013). For, according to another Environmental Health official involved at the *Urbanization Forum* (2013),

[To tackle a lack and poor maintenance of services is] a transversal issue. […]. I can't say that it's been us alone, but working together on a daily basis […] It is a combination of many steps which help move into the right direction".

The various quotes highlight how these platforms share improved inter-departmental collaboration as overarching aim. The three criteria are fulfilled to some extent at least: Information and knowledge is exchanged and integrated (1), departments try to agree on a common definition of problems and goals (2), and they aim to do that in consensus (3). Again, what comes out from the fora is more than what the different participating stakeholders bring in.

Collaboration between the City of Cape Town and other stakeholders

This is more than can be said concerning collaboration of the CCT with residents and CSOs. All CCT officials stressed the need for working with communities in informal settlements. Back in 2010, an official from Informal Settlements pointed out the advantages of "participatory planning partnerships" with CSOs and residents, launched by his department.

> "Where partnerships are working, it is beautiful to see how people are willing to contribute to their own lives. We need networks, we can't just work with the City and residents. […] When [the Informal Settlement department] started, […] there was a strategy meeting and the outcome was that we need partnerships and participatory planning. For instance when we build toilets and the next days they were all vandalized. The community admitted to it. We asked why, and they replied that they never asked the community, they never consulted about the toilets. It is easy to sit and plan in an office in town what must be done but there are people living there every day, we will go back to our houses but they will still be there. We need to plan with them. NGOs facilitate the stakeholder buy in. More NGO companies must come to the fall." [32]

A Sweet Home resident (Lindiwe, 2013) living on the land bought by the CCT in 2012 did indeed mention that facilitators from Informal Settlements came to discuss the process of temporally relocating residents while the depression in the middle of the area be filled and shacks re-blocked. Still, that is only one-sided communication, not two-sided collaboration.

In the case of Sweet Home, this lack of interaction is mainly due to the fact that the ward councilor is the missing node in the institutionalized participation and communication chain between residents and the CCT. In Sweet Home, residents doubt that the local government cares for them, they feel abandoned. In reaction, they have to resort to alternative ways to bridge the distance to those able to support their community. The community leader increasingly constitutes a direct link between residents voicing their specific grievances and the relevant CCT department directly. Protest actions and marches to CCT offices are organized about once a year in order to direct attention towards grievances and non-kept promises (Sacks 2012). As violent destruction, protest actions and marches to CCT offices become the preferred channel of communication, tensions and negative feedback between CCT departments, the Mayor of Cape Town, and informal settlement residents increase. CCT officials get "scared" of entering informal settlements (DA councilor 2013). Sometimes,

> "[residents] say 'oh, you work for the DA'. But he's just coming to do his work. He's got nothing to do with politics. Absolutely nothing. You know, then they chase them away. Set a fire. Set a truck on fire. Agh! I don't understand.." (DA councillor 2013).

---

[32] This quote is not a word to word transcription of the respondent's statements.

And so the vicious circle of disrupted initiatives, of blame, of frustration ("Agh!"), reinforces itself.

The relationship between residents and CSOs, the media and academia holds more promises. Sweet Home's chairperson further tries to strengthen relationships with external stakeholders by interacting directly with the media, with incoming researchers and during the collaborative workshop organized with CCT officials, as well as with other community groups in Cape Town and over the country (Resident interviews 2013; Sacks 2012). He can rely on a wider network, being former member of a CSO called *The Warehouse*, current member of the South African shack-dwellers movement *Abahlali baseMjondolo*, and recent co-founder of the CSO *Ubuale Bakha Ubuhle* which counts members both within and outside Sweet Home. This strong involvement of the community leadership in trying to decrease the community's isolation gives hope concerning adaptive capacity. There is a will to innovate, and a will to change the set of available inputs that determine Sweet Home's adaptive capacity (Yohe and Tohe 2002, cited in Pelling 2011 p. 36).

Concerning the interaction between CCT departments and other stakeholders, the Task Team also aims to improve engagement with locally elected politicians, contractors, weather forecasting teams, the media and CSOs (DRMC officials 2013). This linkage balances more towards 'plain modularity' than collaboration though. A paternalistic stance from the CCT towards CSOs prevails; those stakeholders being "activated" (DRMC official 2013), and hardly involved in problem definition and strategic planning.

> "The City's got a definition about flooding meaning if the water is knee high or shin high, in your house, that constitutes flooding. Not if you just wet. So flooding is defined by them, and not by us. And if they decide it's flooding, then we obviously need to assist" (CSO member 2013).

The wording is interesting: the CCT 'decides', they define the problem; the CSO 'assists', they follow the orders.

Barriers to resilient and adaptive governance

The CCT is aware of various external socioeconomic factors hindering their ability to effectively reduce disaster risk across the city: in-migration and urbanization, service and housing backlogs, unavailable land for development, and high levels of poverty and unemployment. The scope of the problem is massive, and Sweet Home is just one of hundreds of informal settlements that external stakeholders have to support (TRS official 2013). Local government, CSOs and residents still do have room left to maneuver and adapt their flood risk governance system. However, barriers lie on the way and will now be described using the framework by Ekstrom et al. (2011). It is important to note that classifying the barriers into the five categories is not a clear-cut process; a certain barrier

might have its origin as a cultural and behavioral barrier (e.g. distrust of residents towards government), but the outcomes could be seen as a participation and engagement barrier (e.g. residents and government not being able to engage constructively with each other).

Resources

According to Moser and Ekstrom (2010, p. 4), "inadequate resources are often the first response practitioners give when asked why they have not yet begun adaptation planning". This can certainly be endorsed for Cape Town. Both residents' and external stakeholders' insufficient assets in dealing with flood risk have already been addressed in the previous empirical chapters. It is worth highlighting here that CCT officials felt themselves that they lacked appropriate skills for engagement, conflict resolution, and facilitation:

> "This is a skill that project managers need to learn, people skills, getting people to work with you" (Informal Settlements official 2010).[33]

This holds true for politicians and residents as well. Aviwe (Sweet Home resident, 2012) recalls how one resident was consulted by the TRS contractor building infrastructure on the land owned by the CCT:

> "it was one of the ladies who was staying that side who [interacted with the contractors from TRS]. So the people of the community said she was always saying 'yes, yes, yes, yes'. Up until the end of the thing. But the community members didn't expect this kind of road. They were expecting the tarred roads. Because she didn't understand English, she was saying 'yes, yes, yes'. If they said the gravel road… 'yes'. Everything 'yes'. Open channels, 'yes'. "

The language barrier but also limited knowledge on infrastructure and their use and maintenance (for instance of the open drains) proved to be important shortcomings in this case. Residents' lack of knowledge, on the CCT and political institutions, on citizens' rights and responsibilities is acute as well:

> "the literacy level of the people is still here [*holds his hand low*].. where they cannot establish between the party, and the community.. and the ward councillors' functionality.. […] But this is what we've inherited" (DA councillor 2013).

Amongst others, this inheritance prevents residents from tackling the external socioeconomic vulnerability factor of the absent councilor:

> "[I am not trying to resolve the problems with the councilor] because I don't have any plan how to, I don't know how to resolve" (Sweet Home chairperson 2013).

---

[33] This quote is not a word-to-word transcription of the respondent's statements.

Institutional and regulatory barriers

The CCT is an institution which can be difficult to maneuver, even after years of experience. It was compared to an "elephant" by an Environmental Health Practitioner, to a "giant animal" by a World Design Capital official (2013). The latter, concerning budget allocations decided on by ward councilors, stated:

> "It has to go through the system, that can take up to three months. […] So it is the system that is for fairness, transparency and quality. So it is there for a reason, and it works incredibly well. However it is not a system that works incredibly well for innovation. Because as we have been discussing, everything has to be compliant and everything has to be pre-approved. And if you look at these two issues, there are in a way contradictory to new ideas, to piloting, to prototyping, to experimentation, to iteration."

Red tape and a slow bureaucratic procurement system can partly explain the witnessed inertia. But institutional barriers specifically prevent departments from working with each other. According to the same official,

> "currently the mechanisms do not exist that much for line departments to work together. So the systems have been designed, and we always get this metaphor, silos, coming up. And again, it is not negative, it supports something powerful and strong and stores a lot of knowledge. But we often talk of jumping across the silos, and creating mechanisms that don't have to go all the way to the top to cross over, or all the way down to the bottom to cross over".

Collaboration is easier to achieve between officials on the ground, and between the Departments' Executive Directors who meet regularly at so called Executive Managerial Team meetings. In between, collaboration is moreover hampered as departments are based in spatially-segregated offices all over town and make use of directorate-based financial and reporting structures. Also, the administrative boundaries (called 'city regions') of the different departments vary, and do not match the political boundaries of sub-councils and wards. The map below (cf. fig. 29) illustrates how confusing the boundaries drawn around Sweet Home are: a multitude of service regions are listed in the legend, the boundary lines do not overlap, and the settlement falls within the TRS service region 'Khayelisha', the Electricity service region 'Gugulethu', and in DRMC's 'Area Central', to name but a few. A DRMC official (2013) states, on the very same subject: "It's actually ridiculous".
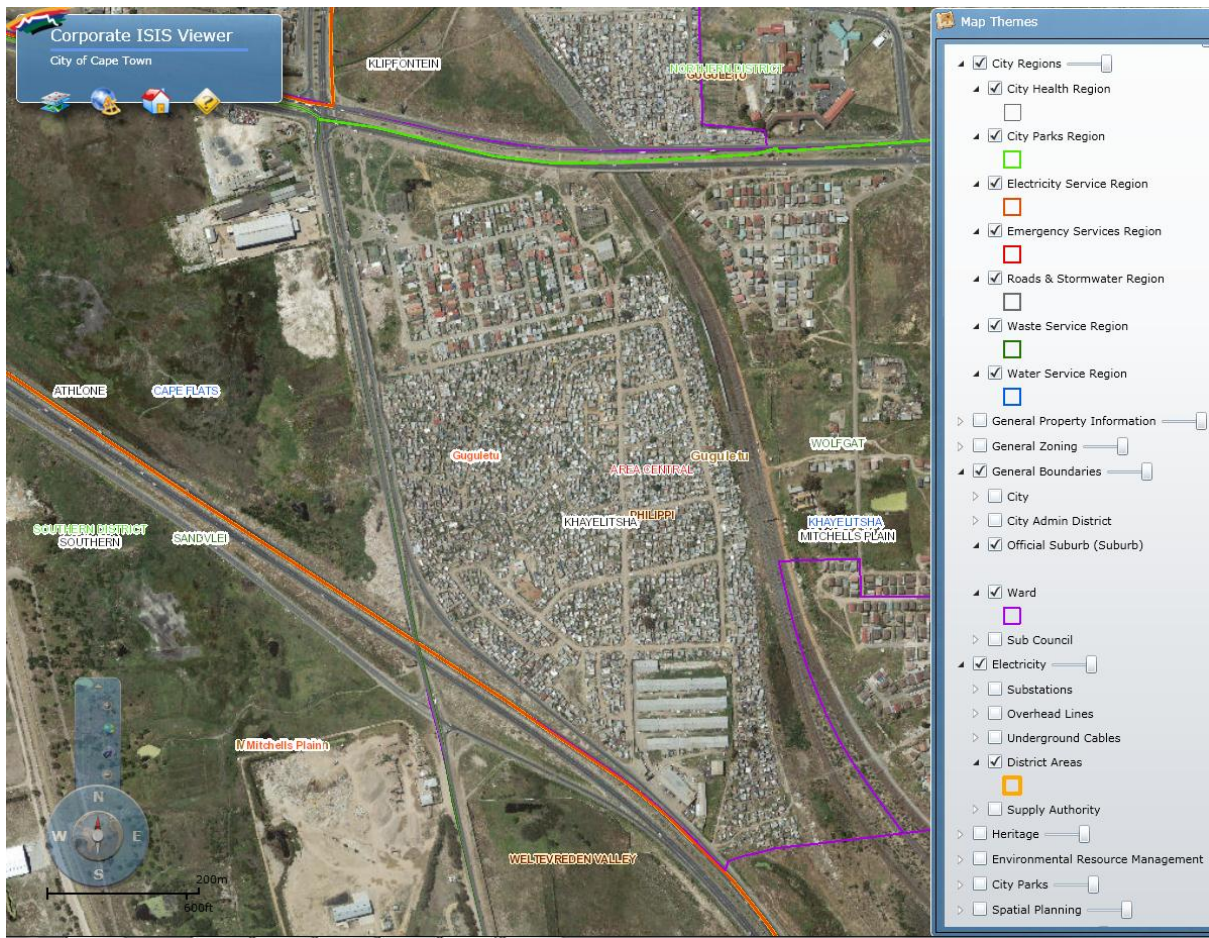
Figure 29: The 'boundary mess' around Sweet Home informal settlement. Source: Corporate ISIS Viewer 2013

While departments might strive together to achieve a common goal, they still have to fulfill their varying mandates, leading to tensions and negotiations about "priorities":

> "what might be a priority to us is not a priority to somebody else. Or for another department. […] Everyone else got their own priorities. And unfortunately we just have to wait until the others come and deal with our problem" (Environmental Health official 2013).

Another example of mandate specification not conducive to resilience: the Human Settlements department is tasked for developing infrastructure plans, while other departments later maintain that infrastructure. The case of open drains exemplifies how what may be practical for one department can become "a nightmare" to maintain (TRS official 2013) for other departments. In the view of an Informal Settlements official (2010), the open drains are simply an ideal fit for informal settlements, as hyson cells can flexibly go around corners and fit in tighter spaces. But

> "they [top up managers] live in an ideal world, except we see it's not functioning properly. We can see it on the faces of the community, they think we are responsible" (CCT official 2013).

The distribution of mandates, across and within departments, is thus not always conducive for working towards a common goal.

That is also true concerning the way politics have been made integral part of and interfere with the work of the CCT. In the words of an interviewed DA councilor (2013):

> "at the end of the day, it's not the politician who's going to suffer, it's the poor people that's suffering. […]. They are crying out for help. But we are playing politics.. and petty politics for that […] but I think it is the system in the country that is not right. […] Coz the more I want to be apolitical, the more the system force me to be political ".

Political short-termism puts a strain on proactive planning. First of all, ward councilors will be less supportive of proactive planning as it does not pay off electorally (councilor 2013). On an even larger temporary scale, questions about climate change did in some cases elicit laughter from CCT officials. Apart from awareness raising activities which are rolled out by DRMC and the Environmental Resource Management, climate change is not taken into account when external stakeholders develop initiatives.

Rumors and finger-pointing between parties the ANC and the DA are ripe. Two councillors (2013) talked very openly about how, in their view, party politics impact on service delivery, budget allocations, urbanization:

> "we're from the DA [laughs] but we don't wanna talk political things, pro-DA, except to say that often the inability of the City to perform its task is due to political influence and so on. And the worse that you make the City look, the more mileage for the opposition".

These issues are likely to remain lurking in the background for a long time, partly as politics are institutionalized, and partly as the majority of CCT respondents firmly stated that they do not try to resolve problems with political roots, even on a more punctual basis:

> "I don't try and get involved [with community leaders or committees]. […] very politically charged these areas. I don't wanna [be] part of that. […] I'm just more on the technical side, and that's it" (TRS 2013).

Coming back to the issue of department mandates, in some cases, these partly overlap, or are not correctly defined. Unclear and contested roles and responsibilities within and across CCT departments, as well as amongst residents, greatly lower the feasibility, that is the

actual implementation, of initiatives. The cleaning and maintenance of storm water drainage systems illustrates this barrier, and how over-redundancy can become a challenge. When asked who is responsible for unblocking storm water channels, CCT officials as well as residents (2012 and 2013) were unsure whose mandate it belongs to. Solid Waste officials argue that if there is solid waste blocking the storm water channels, then it is TRS' responsibility to unblock their storm water channels; whilst TRS on the other hand, argue that if there is solid waste present, it is Solid Waste's responsibility to clear the waste.

Finally, a critical institutional and regulatory barrier impacting on the ability of stakeholders to work collectively to address flood risk is that of monitoring, at all levels. Monitoring fosters accountability and transparency (Lebel et al. 2006); it also provides valuable data on basis of which initiatives can be adjusted, system inputs adapted, new knowledge acquired (Resilience Alliance 2010, p. 37). Yet, there is a lack of monitoring structures, especially of ward councilors, of contractors providing services on behalf of the CCT (e.g. waste removal) and of local leadership in informal settlements. Monitoring community leaderships is especially far-fetched as informal structures are not legally recognized. Moreover, concerning contractors:

> "I don't know what is wrong in the city.. but there's not [a] project manager who signs off the job. [...] They first pay the contractor [...] and give them the money, and say thank you for doing a good job. But then the job did not even start yet. You see. And then if I was that contractor, I would not clean any single drain" (councillor 2013).

The same issue became salient in Sweet Home at the end of 2012, when the head of the contractor appointed by TRS died, leading to the settlement not being serviced for several months without checks nor balances. This in turn nurtures a culture of distrust, disillusionment, and blame, which we will now turn our attention to.

Cultural and behavioral barriers

Cultural and behavioral barriers encompass the profound "identity, core values, and worldviews that constrain adaptability" (Folke et al. 2010, p. 23). The way one stakeholder perceives the others is part of that worldview. In Cape Town, the present climate of distrust and frustration is the result of a long history of oppression, and broken promises since 1994 (Zuern 2011). Tensions are running high and are politically charged, as described in the contextual chapter. This proves to be a barrier for adaptive governance, as levels of trust between stakeholders play a prominent role in coping with social dilemmas (Ostrom 2010, p.2). In our case, the dilemma takes form as stakeholders do not accept the joint responsibility to manage flood risk, or do not perceive the others as pulling their load. As a

reaction, stakeholders put in less effort themselves to carry out their present tasks, or do not see why they should bother in being innovative and try to adapt the governance system.

To put it bluntly, those which should be partners in tackling flood risk are often perceived as enemies derailing one's efforts. That applies between departments with different mentalities, between CSOs, but especially between the CCT and residents. Among CCT respondents (2013), some stated that other departments were "causing the problem" for their department, that other colleagues do not "realize", that it is tough to make them do "their bloody job". A strong statement by a CCT respondent was that " the city contradicts itself". CCT departments are clearly not always on the same page.

Suspicion also manifests itself between CSOs:

> "There's one of the things, as a new person in this field, that I'm discovering, is the suspicion that different role-players have of each other. […] people want to know why I told those people that idea, when we could be doing my idea… agh. So I don't get that thinking" (member of the *Mustadafin Foundation* 2013).

Concerning the distance between local government and residents, A DRMC official (2013) uses the strong term 'barrier' himself:

> "There is a constant barrier: It's us and them".

A large collection of quotes substantiates that prejudice towards residents is present in the CCT, across departments, at various levels, and both in the political and the administrative realm. While these allegations are to some extent not completely unfounded rumours, some statements were quite heavy.[34] The perception could also be traced back in CSO statements, although in a more nuanced form:

> "it's not that I believe everybody in the community is that way. But we've experienced where people are just unwilling to take responsibility to move things forward. […] there's a whole collapsing of different values and different expectations" (member of the *Mustadafin Foundation* 2013).

The perception from the Sweet Home community towards the CCT is not rosy either. We have already described residents' low valuation of the CCT efforts. This can take a very emotional form, as reflected in this statement of the chairperson (2013):

---

[34] Stating, for instance, that in general residents dump more to create more EPWP jobs, build their shacks in flood-prone areas intentionally to get relocated quicker, violently destroy CCT infrastructures, or spend their time sitting around passively waiting for external support.

> "If the government still <u>loves</u> its people, they must show it by fulfilling their promises."

The gulf of misunderstanding widens even more as departments can define problems in a very abstract manner, miles away from residents' reality of hardship and need. For instance, the CCT guideline is to provide one toilet to five households, and one standpipe to 25 households, but

> "then you said ok, that's the number of toilets and standpipes [that we need to install in order to respect the guidelines]. And that's the backlog. If you said now ok, because of the density of the area, you cannot provide any more [...] if you cannot put in more toilets, then actually there is no backlog. [...] That is an academic approach to the problem.. [laughs]" (Water and Sanitation official 2013).

Even more seemingly surreal is TRS' reluctance of servicing roads which are not represented on the official map, as pointed out during this exchange of two CCT officials (2013):

> Official: "the issue of the Roads is that.. because these roads are not proclaimed, they will not... [...] if somewhere on the map"

> Another official: "it's an unmade road, so it doesn't belong to them [...] So they don't have to maintain it. It's ridiculous. How can we get our services in there?"

This abstract problem framing is difficult to grasp for other CCT Departments and lower-placed officials, not to mention residents. Communication and behavioral barriers thus relate not only to the way people think about each other, but also to the information and knowledge they value, shaping their perception. According to a DRMC official (2013):

> "I think sometimes, we as officials and City services, we have our own opinion of things and how things should be. And sometimes.. that's not what the community wants. They have their own.. and sometimes.. there isn't a platform where we can actually.. where the two can meet... and we can... um... what's the word I'm looking for? Where we can meet and make positive change. In realizing our needs and their needs. Coz sometimes we, as City officials, come in very headstrong. [...] But there are things that I think also, the community knows best".

Participation and engagement barriers

The last quote ties up to issues of participation and engagement, frequently recognized as being integral part of 'good governance', and also especially central to achieve context-specific management of socio-ecological systems (Lebel et al. 2006). However, in the present case, external stakeholders' interventions, whether proactive or reactive, often exclude consultation with CSOs and residents. The paternalistic approach towards CSOs has been elaborated on before. The lack of consultation with residents exacerbates the

disjuncture between the needs of residents and expectations of CCT officials described in the previous chapter. When external stakeholders highlight the need for interactions with residents, they mostly argue that it is to "create consensus around management initiatives" implemented top-down, rather than to "understand system dynamics" and learn from residents – a key difference between conventional and adaptive governance (Resilience Alliance 2010, p. 37). The following quote points out that there is 'no way around' including residents, else initiatives are disrupted:

> "If you don't do that, don't even try to put a toilet down. I'll put it that way! [laughs.. other CCT official joins in] [...] don't try and put a toilet down. And tomorrow... it's either in the nearest channel, or it's thrown out. No. community involvement is paramount in these areas" (Water and Sanitation official, 2013).

The rationale behind community involvement is more feasibility than effectiveness, more reaching fixed targets than defining and fixing the targets together. The problem is defined, solutions devised and decisions made without consultation with communities. Engagement between residents and formal structures can exist, but then mostly on an ad hoc basis, as resident participation is not institutionalized other than through the ward councilor. For instance, no direct resident input is required during DRMC's elaboration of risk assessments. It would seem that in defining the problem, expert knowledge is higher valued than lay knowledge. According to DRMC officials, those assessments "are not child's play" (2013), they are "comprehensive, scientific-based disaster risk assessment [...] and that information rests on scientific study" (2010).

Further along the planning continuum, residents (2013) complained about the lack of collaboration when it comes to devising strategies and taking decisions. They are only passive witnesses to initiatives decided from above, for instance when a company contracted by TRS comes to upgrade roads.

Information and communication barriers

Ongoing information and communication is needed during the adaptation process, concerning the problem and implemented solutions (Moser and Ekstrom 2010, p. 4). Regarding 'solutions to the flooding problem', Sweet Home residents find it frustrating not knowing which department to call when issues such as solid waste blocking channels arise. A lack of clarity and transparency in this regard results in delayed interventions or no assistance at all:

> "We work with the city, yeah, but problem is only ... It's depending when you say city, which city" (Sweet Home chairperson 2013).

"I want to know who to talk to if we need help, because there are times when you call the department and you cannot get hold of the person you need to talk to, and you end up not getting any assistance" (Sweet Home chairperson, May Workshop 2013).

At community level, unclear roles and responsibility often causes confusion for CCT officials trying to identify the relevant local contacts. Several CCT officials and councilors, residents, and CSO members (2013) mentioned instances of proposed initiatives either being delayed, vandalized, or failing completely because 'local authorization had not been granted'. This statement by a DRMC official (2013) underlines how the leadership situation is at the root of miscommunication, thus low feasibility:

"Sweet Home.. […] They've got a political issue there. At the moment. Where there's a clash between two political parties. And somehow, they jeopardized our program. Coz they didn't want us to come. Coz we didn't liaise with the one. We only liaised with the ANC, and we didn't liaise with the other one. And they weren't happy, and said they must leave, otherwise they're going to boycott the show."

Communication problems do not only occur in both directions between the CCT and residents, they also exist within the CCT itself. Unclear or overlapping mandates lead to delays, as visible from this exchange on how officials first turn to the Human Settlement, even if Water and Sanitation should actually resolve the issue:

"I think that everyone says that the informal settlements actually belong to Human Settlements. But because we're Water and Sanitation, they said no, you must provide the water and sanitation. So that is that.. I wouldn't say conflict.. […] Communication. If there's a problem in the informal settlements, then they'd normally go to Human Settlements and complain. And then they'd come over.. [back to us] and say no, why aren't you doing your job? So.. yeah. Maybe there is some tension. […] You [the residents] will have to wait. Because you informed now the call centre, they go to Human Settlements, and Human Settlement comes to us" (Water and Sanitation official 2013).

According to a CCT official from DRMC (2013):

"The official that receives the first call, if it does not fall within his area, he should pass on to the next colleague. But he doesn't".

Information on which departments base their initiatives differ, and is not always shared with everybody. Human Settlements for instance updates GIS layers, which are not always easy to access for other departments (DRMC official 2013). The case of diverging household counts, critical to determine how many sanitation blocks etc. are needed, is evocative:

Water and Sanitation official: We've tried and we can't count. [laughs]. It's never the same.

Another Water and Sanitation official: Health has their counts, we have our counts, and Solid Waste have their counts. I think last year we decided to go for Solid Waste. But now when everybody's happy.. and we accept that figure. The 2011 census came and said no… we've got a different number (2013)

The count differs among departments, but also with the national census. This single case raises an important question: How can flood risk effectively be tackled in unison if the various departments base themselves on diverging information on the scope of the problem itself?

The role multi-stakeholder platforms could play in overcoming barriers

We have identified a large number of barriers to adaptive governance. Adaption is difficult to achieve, due to institutional inertia, deeply rooted prejudices, and many more. But these barriers are not only numerous, they are also deeply rooted. In the given context of interwoven elements of prejudices, misunderstandings and frustrations, stakeholders find it difficult to reach out and truly collaborate. That is where the FLiCCR research group, coming in as an additional external stakeholder, could play a role and contribute its own assets. In the words of a high-ranking DRMC official (2013), FliCCR was an external body "looking in from the outside", yet adding value in putting pressure on stakeholders:

"You guys are challenging us in terms of engaging with the public".

Did this "challenging" bear its fruits, to which extent did the workshops contribute in overcoming barriers to adaptive governance?
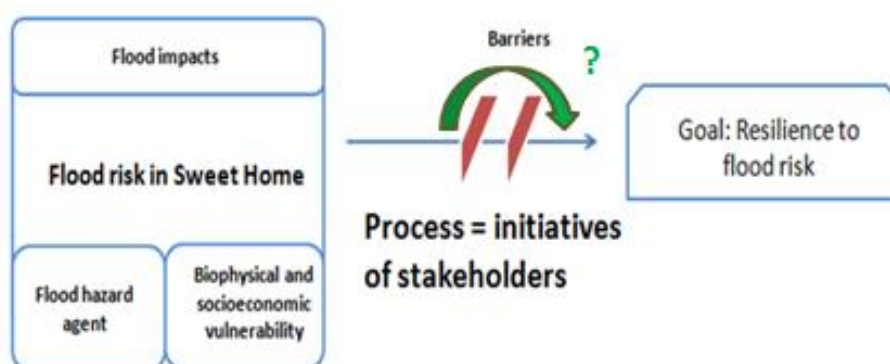

Figure 30: Conceptual scheme as enriched by empirical findings II. Source: Author 2013

Resources

Obviously, FliCCR's resources could not compensate for the shortage of assets faced by all stakeholders. The main asset brought in by FliCCR was a 'safe space for engagement'. Indeed, by organizing multi-stakeholder platforms, FliCCR acted as an intermediary which brought about social innovation not in silo-based, individual sectors, but in the spaces in-between (Nambisan 2009). This 'space in-between' held a lot of potential because it was new and lacked a history of past failures and tensions. FliCCR being the group of researchers behind the workshops meant that that space could also be perceived by stakeholders as less biased and more politically neutral, as opposed to spaces which might be convened by other stakeholders such as the CCT (DA oriented in the view of some residents) and CSOs:

> "with NGOs,… they also getting so politicised that you don't know which is NGO and which is just a normal extension of a political party" (DA councillor 2013).

Moreover, FliCCR is a group independent from the CCT (unlike CSOs who often enter into more permanent relationships with the CCT, thus having more to win or to lose if acting as brokers) and respected and grounded in the local context (unlike CSO which are sometimes perceived as 'foreign influences').

However, it was important for the workshops' agendas not to be dominated by the FliCCR team which, as part of academia, is accountable for objectivity and high ethical standards (King et al. 1994). This was partly achieved by funding an external professional facilitator and using specific facilitation tools to provide a 'voice' to all the participating stakeholders. One of these tools was *Open Space Technology*, a manner of organizing workshops where participants set the agenda themselves, emphasizing that they are best equipped to highlight salient topics (Owen 2008).

Participation and engagement

The resulting FliCCR initiatives were four workshops (cf. Annex 1) during which multiple stakeholders could enter into dialogue – an achievement in the view of many, including the facilitator who was at pains to make the third workshop happen (2013):

> "we just kept getting this feedback that it's not gonna work […] from many people, you know. Actually from all sides. […]] Stakeholders were saying] 'we've <u>tried</u>, people don't listen, people aren't coming to Philippi, it's too much of a risk, it's just too time consuming'".

According to UNISDR (2007) and Djalante et al. (2012), multi-stakeholder platforms are a good alternative for governing those issues on which stakeholders have been 'hitting their

heads' for years. Multi-stakeholder platforms are seen as a more flexible and participatory governance method whereby different stakeholders are brought together to interdependently, yet collectively, agree on strategies for solving problems (Djalante 2012; Steins and Edwards 1999). They bring together a diversity of stakeholders, at different scales, to collectively work towards more coordinated and integrated DRR activities. This diversity was present during the final two FliCCR workshops in particular, with interaction between *Task Team* departments, but also CSOs, residents and academia.[35]

Collaborative platforms needed for social innovation can take on many forms: exploration platforms aim to define the problem, experimentation platforms aim to test possible solutions, and execution platforms aim to disseminate those solutions (Nambisan 2009). The platforms facilitated by FliCCR were exploration platforms, because they aimed to bring together diverse stakeholders who all held a piece of the bigger puzzle, in order to bring those pieces together to get a broader understanding of the issue and to frame the problem more accurately and completely. Residents' problem framing was shifted to the foreground during the final workshop held directly in Sweet Home. This sessions' agenda was set by the residents prior to meeting with CCT officials, in order to ensure that residents were empowered to speak about their own experiences and concerns (cf. figure 31a and 31b).

Figures 31a and 29b: Fourth and final workshop held in Sweet Home's community hall. Residents prepare the agenda(left), and meet CCT officials on the *Task Team* (right). Source: FliCCR 2013

As Nambisan (2009) highlights, it is only once a shared definition of the nature of the problem is developed that stakeholders can collaboratively work towards possible solutions. For instance, attention was turned towards engagement processes and the shortcomings of the official (politicized) channel of participation:

---

[35] The first two workshops did not provide the space for the participation of stakeholders external to the Task Team, and their agendas and selection of participants were carefully guided and dictated by the FliCCR team and the Task Team. This because, before 'unleashing' residents, officials, councilors and CSO members on one another, issues needed to be addressed within departments on the Task Team themselves, and needed to be known by FliCCR members.

"We have said that the government must check with the people regularly. We also want them to send someone who is passionate about helping people so that they do their job properly. It would be better if they got someone who's a community member and not involved with politics, someone who has people's interest at heart" (Sweet Home chairperson, May workshop 2013).

However, given the *ad hoc* nature of the FliCCR workshops, limited in time and scope, stakeholders' problem framing came second, and effective dialogue – reacting on other stakeholder's statements and reaching consensus as defined by Ansell and Gash (2007, p. 543) - was non-existent. A majority of the time was devoted to reassuring each other, as we will now see.

Cultural and behavioral

Although the FliCCR team used external facilitators trained to facilitate dialogue, bringing multiple stakeholders into a 'neutral' space to the challenges and possible solutions to flooding is almost impossible. The stakeholders participating in the workshops bring with them their preconceived notions, experiences, and even frustrations; factors that make it even harder to maintain levels non-bias in collaborative platforms. A member of the *Mustadafin Foundation* (2013) thus states, concerning some CCT officials present at the third workshop in March:

"they were so committed to how right they are about their view.. that they couldn't hear any other view. And…and so they didn't experience that their experience on the ground had validly been heard.. or had been heard as valid either. They only heard they were invalidated. […] they were clearly so angry".

Still, in the view of the external facilitator coordinating that same workshop (2013), debate (i.e. exchange with the aim to make the other adopt your view-point) did not completely outbalance dialogue:

"there is always a place for debate and dialogue, just as long as we don't stay stuck there. And my impression that we managed to move into a certain level dialogue. It wasn't you know deeper dialogue, but you know, there were many moments today where people could have gotten stuck. There were a couple of moments today when I thought 'oh we're gonna get caught up on this one', but we didn't. And I think there was… an awareness to listen that was beyond expectations on my sides".

Some prejudices could be deconstructed during the workshops. Those helped to clarify that, contrary to popular belief, it is not true that officials and residents do little and expect the other to resolve the flooding problem. An understanding of the challenges faced by the others was fostered, some residents (2013) stating after the workshops that 'their

temperature had gone down', that it 'made them happy' to see that others are trying. Most importantly, stakeholders became aware of the role they can play themselves in removing constraints faced by the others when trying to carry out initiatives. Among others, contested areas of responsibility between departments but also with other stakeholders were highlighted. Consensus on problem framing could also be reached and some perceptions contradicted or reinforced. Illustrating this was a discussion by residents and CCT officials on solid waste:

> "We are filthy. We just dump. We don't care. We are very careless, and we take responsibility for that" (Mandisa, Sweet Home resident, May Workshop 2013).

It was useful to turn attention away from outcomes (and broken promises) towards processes and opportunities to improve the DRR process and escape the present vicious circle of unsatisfying results, low expectation and prejudice. The CCT openly acknowledged their shortcomings and expressed their will to meet a middle ground:

> "There are things that we've put together.. the measures.. but we haven't succeeded in working with them. That is why we are happy that the city is here. so that you can hear from us, and then you can suggest some of the things that we can take forward. We trust that now that you are here, you are committing yourselves that you are not alone in this. We are here as the city to commit together with you. Because we are all living in the city of cape town" (DRMC official, May workshop 2013).

This again highlights cultural and behavioral factors (trust, commitment), a willingness to learn, but also a goal all stakeholders strive for, because they are "all living in the city of cape town". Residents could express their goodwill as well:

> "I would like to send my message to the city we are not fighting with you. We would like to work with you. We want to set an example to other townships that it is possible to work with the city" (Sweet Home chairperson, May workshop 2013).

Information and communication

Very pragmatically, the final workshop helped clarify stakeholders' roles and responsibilities. Some external stakeholders, such as this official from Solid Waste (2013), were updated on the current leadership structures during the final workshop:

> "sorry.. sorry.. so does that mean I don't speak to [name previous community leader] anymore? Coz the councillor always tells me, call [name]"

Following nervous laughter and chatting, residents interjected "no, no, speak to [name of the present chairperson]". This quick exchange also pointed to the problems posed by ward

80's councilor, otherwise intensely reflected through his absence at the workshops, despite invitations and follow-up. His absence was a clear limitation to resolve communication issues, and reflective of broader political tensions and frustrations in Cape Town.

CCT mandates were also made more transparent for all involved stakeholders. Residents typed contact numbers into their mobile phones directly during workshops and were able to meet CCT officials face-to-face. As put by Sweet Home's chairperson,

> "to meet this guy… [first name of TRS official] was my dream."

A few information and communication barriers remained unaddressed, such as data collection and data sharing. This also as such processes have institutional roots.

Institutional and Regulatory

Institutional and regulatory barriers are the hardest to overcome through collaborative platforms, especially if those platforms do not include stakeholders in positions where they can change policies or raise the political agenda on the issue. Lack of monitoring, unclear or overlapping mandates and silo-based reporting structures are just a few examples of the types of institutional and regulatory barriers which require higher-level support within the CCT to be removed. The need for such changes was however made salient during the workshops. It should not be forgotten that identification of (institutional) problems constitutes an important first step. The role local leadership and CSOs can play was highlighted during the FliCCR workshops, as well as the need, and willingness, to institutionalize their involvement within formal structures.

Still, although the absence of the councilor for instance raised the issue of monitoring and accountability of politicians, there was little commitment from CCT officials at the final workshop to really take this issue forward. A highly evasive response given by a CCT official during the final workshop in Sweet Home illustrated the issue of red-tape and reluctance by more junior CCT officials to make decisions without consulting their seniors:

> Sweet Home chairperson: "Is it the end today? Or is it something that could continue? If it's not the end… who's supposed to organize something like this again? Is it the community, the residents, or is it the city of cape town?"

> CCT official: "Can we discuss that, [names official], at our next meeting, because that's a … that's one of the touching issues that we need address… as I say… but I won't comment on that."

Conclusions

Resilience thinking and the wish for more collaboration is well represented amongst some departments. New solutions, that is adaptation, are needed, and all voices need to be included in devising new solutions addressing the problem holistically. Within the CCT, practical innovative steps have been made towards collaboration, partly overcoming a traditionally reactive, top-down, silo-based approach. Notably, the *Task Team* was recently established for departments to work together towards achieving a common goal, by combining their various perceptions and knowledge.

Still, shortcomings remain, in particular a paternalistic stance towards CSOs and residents; those stakeholders being 'activated' and 'consulted' in the best of cases. Most often, the rationale for involvement of residents and CSOs is increasing feasibility, getting benediction for initiatives fully devised by CCT departments, not effectiveness. As pointed out by Mc Entire et al. (2002, cited in Manyena 2010, p. 438), this reflects the way DRR processes are shaped: "a paternalistic mode […] can lead to the skewing of activities towards supply rather than demand", towards bandaging gaping wounds rather than devising initiatives effectively addressing root issues, such as "community capacity building, mitigation and emergency preparedness planning".

Scholars have criticized resilience research as claiming to be "determinedly holistic: it treats social and ecological systems as a fully integrated whole", with the result that researchers are "guided by rationalist assumptions [to] […] overlook the peculiar characteristics of the political system that generates the policies they hope to change and the governance of the ecosystems management that they want to improve" (Harrison 2003, p. 1 and 7, cited in Welsh 2013, p. 3). Using the barriers framework by Ekstrom et al. (2011) disqualifies our analysis from that particular criticism. Strong barriers were identified and show that Cape Town's flood governance system is far from being a "fully integrated whole". Some of these barriers, for instance a lack of monitoring leading to unaccountability and frustrations of stakeholders, originate in the governance structure. Others, for example sentiments of distrust and perceptions that others (residents, the CCT, other CSOs) do not pull their weight, are due to stakeholders' specific worldviews and chosen course of action. All these barriers constitute external socioeconomic vulnerability factors which hamper resilience and adaptation.

It is recognized that overcoming barriers is challenging, given the scope and complexity of the flooding problem in Cape Town. In that context, the FliCCR workshops, an initiative organized by academia, were spaces for stakeholders to build a more solid basis for collaboration, following our restricted definition. In contrast to collaboration as it is often

discussed more superficially in the resilience literature[36], we defined it as consisting not only in the ad hoc exchange of material and financial assets, but in a long-term mutual learning process within which other asset exchanges need to be nested – and which may lead to changes in diversity and modularity. Collaboration can then lead to increased effectiveness (via social learning) and increased feasibility (as some barriers can be overcome) of initiatives. In effect, some prejudices were deconstructed during the FliCCR workshops; a common understanding of problems and solutions was partly fostered. Turning the attention from present negative outcomes to possible future processes, stakeholders expressed their willingness to work together, constituting an important step towards promoting a culture of mutual respect. As the facilitator (2013) states concerning the March workshop:

> "I think today has somehow set the groundwork for people to do something that's more intense. [...] If the <u>City</u> itself convened it, it would send a very powerful signal".

While the feasibility of such platforms, when organized by 'neutral' academics, is high, their effectiveness is low on the long-term. Residents and external stakeholders need to be permanent representatives on platforms such as the *Task Team*, in order to ensure that they are not simply consulted to check a few boxes, but that their input becomes central to decision-making and initiatives. This will also help ensure that all stakeholders have a vested interest in and 'own' the platforms, without the need for intermediaries, such as academics, to initiate, facilitate, and monitor the process. FLiCCR offered a space for experimentation. Whether the CCT is willing to send "a powerful signal", and able to carry on, is something only the future can tell.

---

[36] The reader may again refer here to the review of academic conceptualizations of resilience made by Bahadur et al. (2010).

Final conclusions

During a discussion we had immediately following the multi-stakeholder workshop held with CCT officials and residents in the community hall, Sweet Home's chairperson said the following (2013):

> "You know why I am laughing [when you talk of hope]. It's because, I'm still thinking it's a lot of things we need to do before […] You see, there is a lot of things. […] it is not something that can happen by tomorrow".

Our analysis certainly confirms that, from where stakeholders are currently standing, the road to a resilient Sweet Home is still long, and full of obstacles. This is true both from a community perspective, as described through the lens of internal vulnerability factors, and from a governance perspective, relying on the barriers to adaptation framework which allow to unpack external socioeconomic vulnerability factors with more detail. Borrowing from the livelihoods approach, it became apparent that it is very difficult for residents to cope and adapt to flood risk on a very weak asset base, at both household and community level. Enlarging the boundaries of that system to also include external stakeholders showed that residents are by far not left alone to deal with flood risk. Diversity and modularity are well developed: Several CCT departments, CSOs as well as members from the private sector contribute with human, financial and material assets, which are transferred towards the community, but also between external stakeholders. However, these efforts stand in contrast to what residents (state they) witness. While initiatives' shortcomings were also named by external stakeholders themselves, a mismatch could be observed between the perceptions and valuations of residents and of external stakeholders. Following our operationalization, none of the initiatives to increase resilience to flood risk can be called 'successful'.

Following this observation, our third empirical chapter identified barriers which can partly explain low resilience (a quick feasible and effective exchange of assets) and adaptation (changing the set of input factors, increasing modularity and improving collaboration in its restricted definition). Cape Town's current (flood) governance structure is not conducive to changing the status quo. The barriers underline the point that flood risk in Sweet Home is not so much due to insurmountable amounts of rainfall, but to the low ability of stakeholders to cope with these amounts, by devising effective and feasible plans together. Sweet Home residents are not only isolated in spatial, economic and social terms, which constraints them from accessing additional assets. The remoteness between residents and external stakeholders also manifests itself in abstract terms, relating to distances between government and citizens, between spaces of decision-making and spaces of action. Distance is sometimes also manifest in the disconnect between field and high-placed CCT officials

within a CCT department, between departments, between the CCT's administrative and political realm, even between some CSOs.

Aware of resilience's buzzword status, we took certain precautions when handling the concept. First, we were critical of *community* resilience. While it is crucial to concentrate first on the community to identify its context-specific vulnerabilities to a specific hazard at a specific time, focusing on community resilience only when it comes to the assets at disposition to cope and adapt has strong shortcomings, especially in developing urban context.

Second, we departed from the frequent conceptualizations which consist in a fuzzy listing of 'characteristics of a resilient system'. The framework developed in this thesis took a more functional approach, distilling key components: various stakeholders bringing in their assets (diversity), with exchanges of assets (modularity) nested within strong collaborative ties. We find that the higher analytical value of the framework rests in its clarity and simplicity (it is easy to operationalize), but also in a certain degree of pragmatism and context-specificity. The building blocks were given by answers to the basic questions "what is the problem" and "who does what and how well does that work". As opposed to frameworks were authors themselves determine beforehand what makes out a resilient system, the valuation of initiatives and identification of barriers by those first involved, stakeholders themselves, did here play the lead role.

Third, we took care in countering the frequent use of the resilience discourse in line with neoliberal managerial thinking, naively framing all processes as clear-cut, and turning a blind eye towards messy contradictions, power and conflict (Welsh 2013). We find that a reflection on the spatial, institutional and mental distance between stakeholders is lacking in much of the resilience literature. Going beyond an identification of conceptual problem areas, stakeholders and initiatives, we did not only list sets of capacities, as Norris et al. (2008) for instance do, but also questioned the nature of the exchanges between stakeholders, the political, institutional and cultural structures from which they originate, and the barriers which lie on their way. Within the community, processes of exclusions and power relations between informal leaders contribute in putting people at risk. The same can be stated concerning the flood governance system at large, with the prominent example of party politics dictating the actions of the ward councilor. Moreover, contradictions also arise in the tensions between the informal and the (dysfunctional) formal political system.

The downside of an analytical framework partly capturing 'messy reality' is that, often, stakeholders take 'it is complicated' as excuse for not addressing a problem at all. Yet, our rigorous framework of analysis makes policy recommendations straightforward. Specific vulnerability factors and flood impacts which need to be (better) addressed were identified

through intensive interaction with Sweet Home residents. Also, we listed concrete barriers which must be overcome to make effective use of diversity and increase modularity. For instance, the CCT would do well in improving its monitoring structures, in particular of ward councillors and private contractors. Ways to resolve political community tensions should be sought, one option being to inform residents on their political rights and structures. Supporting the sandbag house project which originated in Sweet Home is advisable, and might lead to savings in relief hand-outs. Outcomes of multi-stakeholder platforms organized by FliCCR showed that collaboration can play a key role in overcoming barriers. Ad hoc workshops organized by academia cannot compensate authentic sustainable collaboration processes. Overcoming barriers to adaptive and resilient governance takes a long time to be resolved, with ongoing, sustainable in-depth dialogue and multi-stakeholder engagement.

Table of References

Adger, N. W., 2000. Social and ecological resilience: are they related? *Progress in Human Geography*, 24(3), pp. 347-364.

Agrawal A. and Gibson C.C., 1999. Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development*, 27(4), pp. 629-649.
Ahammad, R., 2011. Constraints of pro-poor climate change adaptation in Chittagong city. *Environment and Urbanization*, 23, pp. 503-515.

Anderies, J. M., Walker, B. H. and Kinzig, A. P. Fifteen weddings and a funeral: case studies and resilience-based management. *Ecology and Society,* 11(1), pp. 21-33.

Ansell, C. and Gash, A., 2007. Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory,* 18, pp. 543-571.

Bahadur, A. V., Ibrahim, M. and Tanner, T., 2010. *The resilience renaissance? Unpacking of resilience for tackling climate change and disasters. Strengthening Climate Resilience Discussion Paper 1.* Brighton: Institute of Development Studies.

Bebbington, A. ,1999. Capitals and capabilities: a framework for analysing peasant viability, rural livelihoods and poverty. *World Development*, 27(12), pp. 2012–2044.

Berkes, F., Colding, J., & Folke, C., eds., 2003. *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge: Cambridge University Press.

Bouchard, B., Goncalo, A., Susienka, M. and Wilson, K., 2007. *Improving Flood Risk Management in Informal Settlements of Cape Town: an Interactive Qualifying Project*. Bachelor of Science. Worcester Polytechnic Institute.

Brooks, N., 2003. *Vulnerability, risk and adaptation: A conceptual framework.* Working Paper 38. Norwich: Tyndall Centre for Climate Change Research.

Bulkeley, H., Schroeder, H., Janda, K., Zhao, J., Armstrong, A., Chu, S. Y. and Ghosh, S., 2011. The Role of Institutions, Governance, and Urban Planning for Mitigation and Adaptation. In: D. Hoornweg, M. Freire., M. J. Lee, P. Bhada-Tapa, and B. Yuen, eds. *Cities and Climate Change: Responding to an Urgent Agenda*. Washington D.C.: The International Bank for Reconstruction and Development / The World Bank. Chapter 5.

Cannon, T. and Müller-Mahn, D., 2010. Vulnerability, resilience and development discourses in context of climate change. *Natural Hazards,* 55, pp. 621–635.

Carpenter, S., Walker, B., Anderies, J. M. and Abel, N., 2001. From Metaphor to Measurement: Resilience of What to What? *Ecosystems,* 4, pp. 765–81.

CCT, 2007. Planning Districts Socioeconomic Analysis 2007. In: E. van Heyningen, ed. 2007. *Strategic Development Information and GIS Department.* Cape Town: CCT.

CCT, 2005. *Study on the social profile of residents of three selected informal settlements in Cape Town*. [online]. Available at: < http://www.capetown.gov.za/en/stats/CityReports/Documents/Informal%20Settlements/Main_Report_2722006113759_359.pdf> [Accessed 15 October 2013].

CCT, 2008. *January 2007 Informal Settlements*, 1:2,000. CCT [online] Available through: CCT <http://www.capetown.gov.za/en/stats/Documents/Informal%20Settlements%20Map.pdf> [Accessed 12 September 2013].

CCT, 2011. *City of Cape Town Council Overview*. [online]. Available at: <http://www.capetown.gov.za/en/stats/CityReports/Documents/CoCT_Councillor_handbook_v3.pdf> [Accessed 2 February 2014].

CCT, 2013a. *About Council.* [image online] Available at: <https://www.capetown.gov.za/en/CouncilOnline/Pages/AboutCouncil.aspx> [Accessed 5 May 2013].

CCT, 2013b. Ward 80 Overview: 2011 Census. Strategic Development Information and GIS Department, City of Cape Town (CCT).

CCT, 2013c. *City spends close to R16 million on flood relief efforts.* [online] Available at: <http://www.capetown.gov.za/en/Pages/CityspendsR16milliononfloodreliefefforts.aspx> [Accessed 20 October 2013].

CCT, 2013d. City upgrades disaster preparedness levels. [image online] Available at: <http://www.capetown.gov.za/en/Pages/Cityupgradesdisasterpreparednesssnowfall.aspx> [Accessed 20.09.2013].

CCT 2013e. *Bulkwater, Stormwater, Sewage and Reticulation shapefiles.*[Environmental Resource Management Spatial Database > P:driv > Catchment Management data]. [Accessed 24 April 2013].

Center for Research on Epidemiology of Disasters, 2009. EM-DAT The International Disaster Database. [online]. Available at <http://www.emdat.be/criteria-and-definition> [Accessed 6 January 2014].

Chambers, R. and Conway, G., 1991. Sustainable rural livelihoods: practical concepts for the 21st century, *IDS Discussion Paper* 296, Brighton: Institute of Development Studies.

Chen, K., Blong, R. and Jacobson, C., 2003. Towards an Integrated Approach to Natural Hazards Risk Assessment Using GIS: With Reference to Bushfires. *Environmental Management* 31(4), pp. 546–560.

Corporate ISIS Viewer, 2013. *City Regions, General boundaries and Electricity shapefiles.* [City of Cape Town CityWeb > Development Information Resource Centre > Spatial Information]. [Accessed 24 April 2013].

Cowan, G. and Arsenault, A., 2008. Moving from Monologue to Dialogue to Collaboration: The Three Layers of Public Diplomacy. *The ANNALS of the American Academy of Political and Social Science,* 616, pp. 10-30.

Crutzen, P. J., 2006. The "anthropocene". In: E. Ehlers and T. Krafft, eds. 2006. *Earth System Science in the Anthropocene.* Berlin; Heidelberg: Springer. pp. 13-18.

Davoudi, S., 2012. Resilience: a bridging concept or a dead end? *Planning Theory and Practice,* 13, pp. 299–333.

Dietz, T., Bélemvire, A., van der Geest, K., de Groot, D., Obeng, F., Rijneveld, W., Zaal, F and Bymolt, R. 2011*. PADev Guidebook – Participatory Assessment of Development*. [online] Amsterdam: University of Amsterdam. Available at <http://www.padev.nl/guidebook.htm> [Accessed 4 November 2012].

DiMP, 2009. Community Risk Assessment Report: Sweet Home Farm, July 2009. *Disaster Risk Science Honours Students; Disaster Mitigation for Sustainable Livelihoods Programme (DiMP).* Cape Town: University of Cape Town.

Dixon, J., 2013. Moving through the city: gender and floods at play. A case-study in Sweet Home Farm informal settlement, Cape Town. Master of Science. Central European University, Budapest.

Djalante, R., 2012. Adaptive Governance and Resilience: the Role of Multi-Stakeholder Platforms in Disaster Risk Reduction. *Natural Hazards and Earth System Sciences,* 12, pp. 2923-2942.

DRMC 2009. *Winter Preparedness Strategy: Report to MAYCO*. Cape Town: City of Cape Town.

DRMC, 2012. *Municipal Disaster Risk Management Plan* in Cape Town. Revised version 5. CCT. Available at:
<http://www.capetown.gov.za/en/IDP/Documents/Statutory%20compliance%20plans%202012/AnnexC_Disaster_Risk_Management_Plan_Rev_5Apr12> [Accessed 12 September 2013].
Ekstrom, J. A., Moser, S.C. and Torn, M., 2011. *Barriers to Climate Change Adaptation: A Diagnostic Framework.* California Energy Comission: Public Interest Energy Research (PIER) Program: Final Project Report.

Evans, J.P., 2011. Resilience, ecology and adaptation in the experimental city. *Transactions of the Institute of British*
Geographers, 36, pp. 223–237.
Ferguson, J., 2010. The uses of neoliberalism. *Antipode*, *41*(s1), pp. 166-184.

Folke, C., 2006. Resilience: The Emergency of a Perspective for Social-Ecological Systems Analyses. *Global Environmental Change,* 16, pp. 253-267.

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T. and Rockström, J., 2010. Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and Society,* 15(4), pp. 20-29.

Füssel, H., 2007. Vulnerability: A generally applicable conceptual framework for climate change research. *Global Environmental Change,* 17, pp. 155–167.

Google, 2013. Google Maps [Online]. Available: <https://maps.google.de/maps?client=firefox-a&q=google+maps+sweet+home+cape+town&ie=UTF-8&hq=&hnear=0x1dcc445134f668dd:0xa5fd371531ad5f68,Sweet+Home,+Cape+Town,+South+Africa&gl=de&ei=DjcfUsTeN66u4QS5sYD4BQ&ved=0CCkQ8gEwAA> [Accessed 23 August 2013].

Graham, N., 2006. Informal Settlement Upgrading in Cape Town: Challenges, Constraints and Contradictions within Local Government. In: Huchzemeyer, M. and Karam, A. (eds.) *Informal Settlements: A Perpectual Challenge?* Cape Town: UCT Press.

Hardoy, J., Pandiella, G. and Velásquez Barrero, L. S., 2011. Local disaster risk reduction in Latin American urban areas. *Environment and Urbanization,* 23, pp. 401-413.

Huchzermeyer, M. 2010. Pounding at the Tip of the Iceberg: The Dominant Politics of Informal Settlement Eradication in South Africa. *Politikon: South African Journal of Political Studies*, 37(1), pp. 129-148.

IPCC*, with Boko*, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: *Africa. Climate Change2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, eds. Cambridge, UK: Cambridge University Press, pp. 433-467.

Islanda Institute, 2012. *Advancing Active Citizenship: A Citizenship Academy as a Means to Strengthen Local Democracy?* Discussion Paper and Roundtable Report. Cape Town: DIsandla Institute.

James, D., 2011. The return of the Broker: Consensus, hierarchy, and choice in South African land reform. *Journal of the Royal Anthropological Institute,* 17, pp. 318-338.

Jennings, S., 2011. *Time's Bitter Flood, Trends in the number of reported natural disasters.* [online]. Great Britain: Oxfam. Available at: <http://policy-practice.oxfam.org.uk/publications/times-bitter-flood-trends-in-the-number-of-reported-natural-disasters-133491>. [Accessed 6 January 2014].

Jungle Theatre Company, 2011. Spirit of Fire and Spirit of Water. [image online]. Available at: < http://jungletheatre.co.za/category/climate-change-risk/>. [Accessed 20 January 2014].

Kennedy, L., 2011. *Politics of Large-Scale Economics and Infrastructure Projects. A Conceptual Methodological Framework for WP2*.

King, G., Keohane, R. and Verba, S., 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton: Princeton University Press.

Leach, M., ed., 2008. *Re-framing Resilience: a Symposium Report*. STEPS Working Paper 13. Brighton: STEPS Centre.

Lebel, L., Anderies, J. M., Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T. P., and Wilson, J., 2006. Governance and the capacity to manage resilience in regional social-ecological systems. *Marine Sciences Faculty Scholarship.* Paper 52.

Lille, de P., 2013a. *Cape Town This Week: The City's Budget has an overwhelming focus on the poor.* Staff newsletter, 3 June 2013.

Lille, de P., 2013b. *Cape Town this Week: Critics of the City's service delivery program ignore facts.* Staff newsletter, 10 June 2013.

Lopez-Marrero, T. and Tschakert, P., 2001. From theory to practice: building more resilient communities in flood-prone areas. *Environment and Urbanization,* 23, pp. 229-249.

Manyena, S. B., 2006. The Concept of Resilience Revisited. *Disasters,* 30, pp. 433-450.

Moser, S. C. and Ekstrom, J. A., 2010. A Framework to Diagnose Barriers to Climate Change Adaptation. *PNAS,* 107, pp. 22026-22031.

Moser, S. C. and Stein, A., 2011. Implementing urban participatory climate change adaptation appraisals: a methodological guideline. *Environment and Urbanization* 23(2), pp. 463–485.

Mosse, D., 2010. A relational Approach to Durable Poverty, Inequality and Power. *Journal of Development Studies,* 46 (7), pp. 1156-1174.

Mukheibir, P. and Ziervogel, G., 2006. *Framework for Adaptation to Climate Change in the city of Cape Town.* [online] City of Cape Town: Environment Resource Management. Available at < http://www.erc.uct.ac.za/Research/publications/06Mukheibir-Ziervoge%20- %20Adaptation%20to%20CC%20in%20Cape%20Town.pdf> [Accessed 4 November 2012].

Nambisan, S., 2009. Platforms for Collaboration. *Stanford Social Innovation Review*, Summer, pp. 44-49.

Napier, M. and Rubin, M., 2002. *Managing environmental and disaster risks affecting informal settlements: lessons in innovative practice from South African local authorities*. In: International conference and meeting of CIB Task Group 40 on informal settlements: Sustainable livelihoods in the integration of informal settlements in Asia, Latin America and Africa. Surabaya, 10-13 October 2002.
Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., and Pfefferbaum, R. L., 2008. Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American journal of community psychology*, *41*(1-2), pp. 127-150.
Ostrom, E., 2009. A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science* 325, pp. 419-422.

Ostrom, E., 2010. Beyond Markets and States: Polycentric Governance of Complex Economic Systems, *American Economic Review,* 1000(3), pp. 641-672.

Owen, H., 2008. *Open Space Technology: A User's Guide.* San Franciso: Berrett-Koehler.

Parnell, S., Douglas, S. and Boulle, J., 2005. Institutionalising pro-poor local economic development through expanded public works in the urban environment of Cape Town. *Africa Insight,* 35 (4), pp. 53- (2005): 53-86.

Pelling, M., 2011. *Adaptation to Climate Change, From resilience to transformation*. London: Routledge.

Pisano, U., 2012. *Resilience and Sustainable Development: Theory of resilience, systems thinking and adaptive governance*. ESDN Quarterly Report N°26. European Sustainable Development Network (ESDN).

Reid, H., Alam, M., Berger, R., Cannon, T., Huq, S., & Milligan, A., 2009. *Community-Based Adaptation to Climate Change, Participatory Learning and Action 60*. London: International Institute for Environment and Development.

Renn, O., 2008. *Risk governance, Coping with Uncertainty in a Complex World.* London: Earthscan.

Republic of South Africa, 1997. *Housing Act, 1997* (Act No. 107 of 1997). Pretoria: Government Printer.

Republic of South Africa, 2002. *Disaster Management Act, 2000* (Act No. 57 of 2002). Pretoria: Government Printer.

Republic of South Africa, 2005. SA National Disaster Management Framework. [online]. Available at < http://www.capetown.gov.za/en/DRM/Documents/SA_National_Disaster_Man_Framework_2005.pdf>. [Accessed 15 October 2013].

Resilience Alliance, 2010. Assessing resilience in social-ecological systems. Workbook for practitioners. [online]. Available at: <http://www.reefresilience.org/pdf/ResilienceAssessment2.pdf> [Accessed 23 October 2012].

Ross, F., 2010. *Raw Life, New Hope: Decency, Housing and Everyday Life in a Postapartheid Community*. Cape Town: UCT Press.

Sacks, J., 2012. *Sweet Home Report: An Investigation into the Socio-Political Character of Recent Road Blockades by Protesting Shackdwellers*. Cape Town.

Satterthwaite, D., and Dodman, D., 2013. Towards resilience and transformation for cities within a finite planet. *Environment and Urbanization*, *25*(2), pp. 291-298.

Scoones, I., 2009. Livelihoods perspectives and rural development. *Journal of Peasant Studies,* 36 (1), pp. 171-196.

Sen, A., 1999. *Development as Freedom*, Oxford: Oxford University Press.

Shaw K., 2012. Reframing Resilience: Challenges for Planning Theory and Practice, *Planning Theory & Practice,* 13, (2), pp. 308-312.

Skuse, A., and Cousins, T., 2007. Spaces of resistance: informal settlement, communication and community organisation in a Cape Town township. *Urban Studies*, 44(5-6), pp. 979-995.

Slovic, P., 1992. Perception of risk: Reflections on the psychometric paradigm. In S. Krimsky, and D. Golding, eds. 1992. *Social theories of risk.* Westport, CT: Praeger, pp. 117-152.

Smit, B. and Wandel J., 2006. Adaptation, adaptive capacity and vulnerability. *Global Environmental Change,* 16(3), pp. 282–292.

Statistics South Africa, 2011a. Census in brief. [online]. Available at: < http://www.statssa.gov.za/Census2011/Products/Census_2011_Census_in_brief.pdf>. [Accessed 15 October 2013].

Statistics South Africa, 2011b. City of Cape Town. [online]. Available at: http://beta2.statssa.gov.za/?page_id=1021&id=city-of-cape-town-municipality. [Accessed 15 October 2013].

Steinberg, F. and Miranda, L., 2005. Local agenda 21, capacity building and the cities of Peru. *Habitat International,* 29, pp. 163–182.

Steins, N. A. and Edwards, V. M., 1999. Synthesis: Platforms for Collective Action in Multiple-Use Common-Pool Resources. *Argriculture and Human Values*, 16, pp. 309-315.

Summer, A. and Tribe, M., 2008. *International development studies: Theories and methods in research and practice*. Los Angeles; London: SAGE.

Sustainable Livelihoods Foundation, with Emergent Cities, 2011. *Shebeen, Context Sweet Home Farm maps*. [online]. Available at <http://emergentcity.co.za/context/context-landing.html> [Accessed 20 March 2013].

Sutherland, C., Robbins, G. and Scott, D., 2010. *South African city and country profile, 3. Cape Town. Produced for: Chance2Sustain Methodology Workshop.* Sao Paolo, Brazil, 18-20th October 2011.

Swilling, M., 2010. Sustainability, Poverty and Municipal Services: the Case of Cape Town, South Africa. *Sustainable Development*, 18(4), pp.194-201.
Thomalla, F., Downing, T., Spanger-Siegfried, E., Han, G. and Rockström, J., 2006. Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation. *Disasters*, 30, pp. 39–48.
UNISDR, 2005. *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters – summary*. Available at <http://www.unisdr.org/we/inform/publications/8720>. [Accessed 10 January 2013].
UNISDR, 2007. *Guidelines: National Platforms for Disaster Risk Reduction*. Geneva: United Nations International Strategy for Disaster Reduction.

Walker, B.H, C.S. Holling, C.S., Carpenter, S. R. and Kinzig, A., 2004. Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society,* 9(2), 5.

Walker, B. H., and Salt, D., 2006. *Resilience thinking: sustaining ecosystems and people in a changing world*. Washington D.C.: Island Press.

Welsh, M., 2013. Resilience and responsibility: governing uncertainty in a complex world. *The Geographical Journal*.

Xu, L., and Marinova, D., 2013. Resilience thinking: a bibliometric analysis of socio-ecological research. Scientometrics, 96, pp. 911–927.

Ziervogel, G. and Smit, W., 2009. *Learning to swim: Strengthening flooding governance in the City of Cape Town.* In: 2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change 'Earth System Governance: People, Places and the Planet'. Amsterdam, 2-4 December 2009.

Zuern, E., 2011. The *politics of necessity. Community Organizing and Democracy in South Africa.* Scottsville: KwaZulu-Natal Press.

Annex 1 – Multi-stakeholder workshops (2011-2013)

Date	Workshop Aims	Key Stakeholders Present
9 Nov 2011	Validate data collected on current and ideal flood management interventions. Understand how departments position themselves with regards to understanding the nature of flooding and current response. Unpack challenges and opportunities for strengthening flood governance.	Flood and Storms Task Team (Task Team) representatives; Disaster Risk Management Centre (DRMC), Provincial Disaster Risk Management, Informal Settlements Management (ISM), Traffic, Roads and Stormwater, City Health, Fire and Rescue Services.
21 Jan 2013	Review and assess the Flood and Storms Task Team's activities in 2012. Unpack challenges around implementation of current and past activities. Unpack challenges around collaboration and ways to strengthen collaboration.	Task Team reps.; DRMC, Development Services, ISM, Environmental Health, Roads and Stormwater, Water and Sanitation.
1 March 2013	Present findings from the FliCCR research to multiple stakeholders central to flood governance in Cape Town. Provide a multi-stakeholder knowledge platform to encourage dialogue and engagement between stakeholders. Allow stakeholders to raise issues key to addressing flood risk in Cape Town (defining its nature, recognizing various realities. Organization of six roundtables where stakeholders could collaboratively set the agenda for possible solutions, for instance 'how to include communities?'	CCT officials, including Task Team reps., and a ward councillor. CSOs, including *Public Health*, *Ikhayalami*, *Jungle Theatre*, *Mustadafin Foundation*, *South African Red Cross Society,* and *The Warehouse*. Academic researchers from the University of Cape Town, University of Amsterdam, and the University of Manchester, and IDRC. Residents from Egoli and Sheffield Road informal settlements.
21-22 May 2013	Provide a platform for Sweet Home residents and CCT officials involved in flood risk governance to enter into dialogue on the issue of flooding. Encourage participants to explore ways of working together to address flooding issues in Sweet Home. A pilot project for ongoing multi-stakeholder forums.	CCT officials, including Task Team reps., DRMC, Solid Waste, Environmental Health, ISM, Roads and Stormwater. Ward councillor (invited but absent). Sweet Home residents, street committee reps., and chairperson.

Annex 2 – Initiative tables

Table 1: Initiatives of external stakeholders targeting internal biophysical vulnerability factors in Sweet Home

Internal biophysical vulnerability factors	Initiatives implemented by external stakeholders
Undulating topography and location on a landfill site	- **Human Settlements** and **Sub-council** (keep relocation lists): relocation of residents to higher grounds in or outside SH
Shack density, narrow alleys and non-existent vegetation cover	-**Community leadership** (keeps count of shacks per section) and **Anti Land Invasion Unit** (works closely with **Human Settlements**): control resident influx and monitor shack extensions - **Human Settlements**: plans to re-block the CCT2 2012 sections -**Ubuale Bakha Ubuhle**, with **resident saving groups** and in cooperation with **Human Settlements** (should provide sand and cement) and other **CSOs**: sandbag house project including re-blocking *(yet to be implemented)*
Shack structures	-**Ubuale Bakha Ubuhle**, with **resident saving groups** and in cooperation with **Human Settlements** (should provide sand and cement) and other **CSOs**: sandbag house project including re-blocking *(yet to be implemented)*
Lack of services, especially in the CCT 2012 and Transnet sections	-**Mayor** and **City Council**: pro-poor budget allocation -**Human Settlements**: plan the building of infrastructure , while **Water and Sanitation** and **TRS** build that infrastructure -**Ward councilor**: *supposed to* make demands and allocate budget for services in his ward
Blocked drains, due to poor usage, poor maintenance or deliberate blocking by residents and external stakeholders	-**Environmental Health** with **Sweet Home leadership** and **EPWP workers**: monitor services, health risks, flooding hotspots and report to other Departments using the C3 communication system -**Company** and **EPWP workers** contracted by Solid Waste: weekly removal of solid waste -**Solid Waste**: removal of bulk waste and illegal dumping, most often after being notified by **residents** -**Company** and **EPWP workers** contracted by TRS: unblock and clean formal and informal stormwater system, prevent greywater from entering stormwater channels -**Company** and **EPWP workers** contracted by Water and Sanitation: unblock sewerage system and maintain sanitation facilities (including the servicing of portable toilets) -**TRS**: monitor, ongoing assessment of bulk stormwater system's capacity, provide round stormwater pipes to prevent blockages in front of shack entries, clean gullies and manholes before winter -**Water and Sanitation**: co-monitor and intervene to repair facilities -**Ward councilor**: *supposed* to take care of community complaints which have not been addressed -**Mayor**, **TRS** and **Community leadership**: negotiations with the private land owner

Internal socioeconomic vulnerability factors	Initiatives implemented by external stakeholders
Residents lack of financial assets (linked to hunger)	**-South African Social Security Agency**: provision of grants to the elderly, the unemployed and the disabled **-City Council**, through CCT departments: Implementation of the EPWP, thus providing employment opportunities in the community **-The Warehouse** and **Mustadafin Foundation** (with donations from the **private sector**): ongoing distribution of supplies and food to residents (nearly daily)
Residents lack of social assets	**-The Warehouse, Ubuale Bakha Ubuhle**: organize activities such as a soccer club for kids and community day trips to the beach. The community based planning of the sandbag house project reinforces ties between residents
Residents lack of human assets (not including awareness)	**-City Council**, through **CCT departments**: Implementation of the EPWP, also enhancing residents' skills, self-esteem and social networks **-Care givers, mobile clinic**: visit the elderly and sick, conduct vaccination campaigns **-Environmental Health**: check on residents' health status, and distribute the *squeezy bottle*
Residents lack of human assets - low levels of awareness surrounding flooding in particular	**-DRMC, Solid Waste, TRS** and **Environmental Health**, coordinated by **Environmental Resource Management**: develop and implemented awareness and preparedness campaigns on various themes and using various channels **-Jungle Theatre** in collaboration with **DRMC** (funding, content input): community theatre, in particular the play "The Spirit of Water" about flooding **-Mustadafin Foundation, The Warehouse**: awareness raising during distribution of food, at parents' meetings, through a Community Evangelical Health club. In progress: preparation of flooding manual with pictures, increase rates of pamphleting **-DRMC** (after being notified by the **weather forecasting offices** and/or **TRS**): send out early warnings -The **media:** enable residents to follow the weather forecast via radio or television **-DRMC** and **CSOs** reaching out to **media**: increase residents' awareness and mobilize support from the private sector
Residents lack of material assets – shack structures and tools to improve them	**-Ubuale Bakha Ubuhle**, with **resident saving groups** and in cooperation with **Human Settlements** (should provide sand and cement) and other **CSOs**: sandbag house project including re-blocking *(yet to be implemented)*
Political tensions in the leadership	NO PROACTIVE EXTERNAL SUPPORT

Flood impacts on the community	Relief initiatives by external stakeholders
Overall – need of coordination, monitoring	- **DRMC**: coordinating role, i.e. identify basic short-term interventions and refer to relevant departments, monitor relief measures and make flood assessment after event - **Ward councilor**: *supposed* to monitor the situation and mobilize external support for his ward
Health hazards (physical and psychological)	- **DRMC** with **Law Enforcement** ambulance: react to community calls via emergency numbers - **Red Cross, SANSAF, Mustadafin Foundation, the Warehouse** (activated and with funds from **DRMC** as well as donations from the **private sector**): distribution of blankets and soup at the community hall, distribution of one pair of bedding and food parcel per impacted household, additional distribution of two meals a day if needed - **Mustadafin Foundation** and **Human Settlements**: trauma counseling - **Clinic** and **Mobile Clinic**: treat sick residents, especially children
Destroyed material assets	- **Environmental Health**: assessment of affected households, request of sand and plastic sheets to cover the roofs - **Human Settlements:** distribution of flood relief kits with batons, posts, plastic sheets - **DRMC**: monetary compensation of ZAR500 to flood victims (previously done)
Residents not able to stay in their shacks	- **TRS** (reacting to requests that **Environmental Health** forwards from **community leadership** or residents): provide sand for residents to put in their shacks - used to provide tires as well, but stopped the process because some residents set the same tires alight on the roads during protests - **Community leadership** and **DRMC**: open the community hall, organize additional emergency shelters (**Environmental Health** does evaluation of emergency shelters) - **Human Settlements**: Temporary relocation of residents
Mobility in and around the settlement	- **TRS**: put in place temporary storm water system (pumps, sandbags as damns etc.) and rehabilitate access roads
Electric power failures	- **Electricity Department** with ESKOM: repair the connections
Higher crime rates	- **Law Enforcement Unit**: patrol settlements and engage in rapid response

Key:
- in red, CCT departments and linked institutions such as the South African power utility ESKOM and clinics;
- in purple, stakeholders belonging to the political realm of the CCT;
- in orange, CSOs;
- in blue, stakeholders belonging to the private sector;
- and in green, stakeholders living within the boundaries of Sweet Home.