Chapter 9: From the Hyper-ghetto to State-subsidised Urban Sprawl

Old and New vulnerabilities in Buffalo City, South Africa[1]

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URBAN POVERTY AND VULNERABILITY IN THE SOUTH AFRICAN CONTEXT

Even without climate change, the life of shack dwellers is full of risk due to densification, the poor condition of their housing and vulnerabilities to such hazards as heavy rains or fires. Since the advent of democracy in 1994, the South African government has undertaken great efforts to improve the lives of poor households by means of a massive programme of state-subsidised housing production, the extension of water, sanitation and electricity networks into formerly disadvantaged areas, and the provision of free basic services to households that fall under certain income thresholds. However, official housing policy soon came under criticism due to new settlements being situated in inadequate locations. Despite policy reforms that aimed at sustainable integrated settlements, an initiative set in motion in 2004, for many projects, past mistakes seem to have been repeated. Faced with shrinking budgets, an increasing number of households living in informal structures and growing unrest and demands for lives of dignity, the South African government declared the upgrading of informal settlements a national priority in 2010. So far, however, political expediency, en-

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trenched networks of patronage and vested interests in the public housing complex have prevented a reorientation towards more incremental strategies.

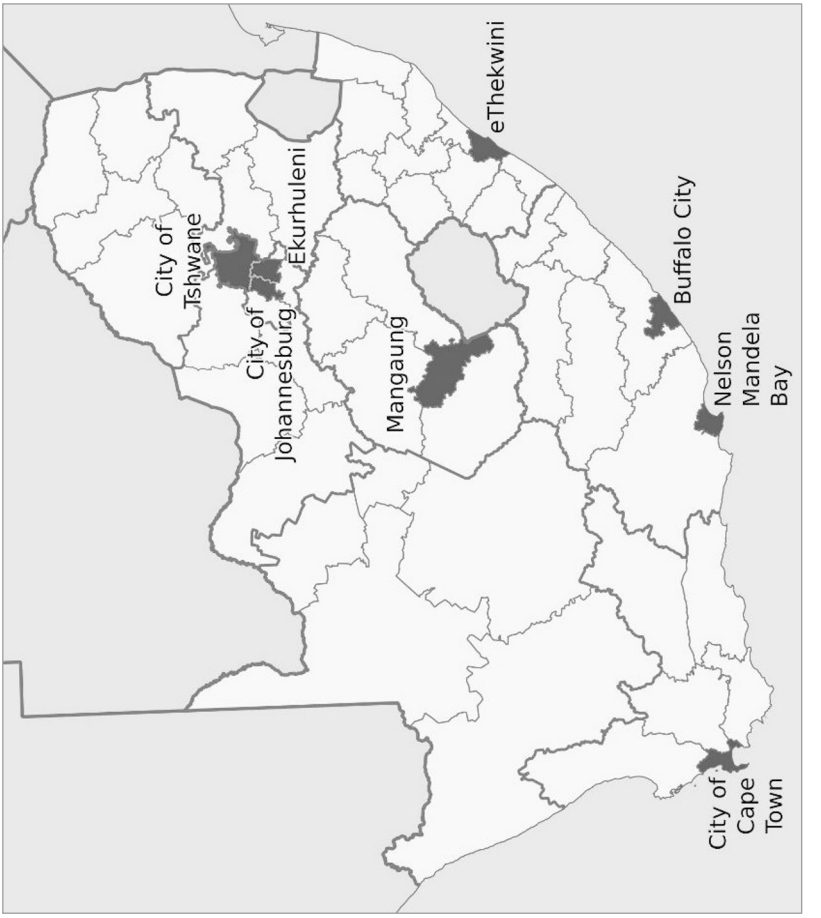
Climate change is affecting South Africa by exacerbating uneven weather patterns, where arid settlements are expected to experience more heatwaves, drought and fires, while coastal areas are likely to suffer from sea-level rise, flooding and landslides. At the settlement level, climate change is likely to aggravate problems caused by poor urban management; for example, poor stormwater drainage systems that cause soil erosion. Increased storm intensity due to climate change will increase the risk of flash flooding in informal settlements in flood-prone areas and on sand dunes (Government of the Republic of South Africa 2011).

Urban planning has played 'a limited role in consciously reducing vulnerability to disasters or everyday risk' in South Africa (Van Niekerk 2013, p. 2). In fact, according to a study carried out by the South African Council of Scientific and Industrial Research (CSIR), in some municipalities, 'planning for everyday disaster resilience [...was not even deemed] part of the planning process, but rather as part of what the "environmental people" do' (ibid, p. 4).The pressure to provide housing and basic services has fixated planners and government on the very near future but it has failed to transform the post-apartheid economy in a sustainable way. Bringing together data on population and economic growth with climatic projections, like the expected change in the frequency of extreme rainfall events, the CSIR has identified regions of socio-economic vulnerability (Van Huyssteen *et al*. 2013).

The CSIR has stressed the importance of identifying in a timely manner the communities and areas at risk of being exposed to hazards, in the hope that geoscience and the application of spatial analyses will help practitioners determine the possible implications of projected risks for settlements and support the respective decision-making (ibid.). More recently, the CSIR was tasked with revising the Guidelines for Human Settlement Planning and Design (CSIR 2000) in order to address the challenges that can be expected as a result of climate change. The council's review points to the need to move toward dense and water-sensitive urban designs, among other initiatives (Van Niekerk *et al*. 2015). In this context, this paper traces a local practice of emergency resettlement and redevelopment, in a densely populated and highly vulnerable informal settlement, that was triggered by everyday natural disasters. It shows how disaster risk, geotechnical assumptions and infrastructural constraints have justified a new project of massive relocation to peripheral areas that have an eerie resemblance and physical proximity to former apartheid townships. Based on interviews with politicians, municipal officials, consultants and shack dwellers, anal-

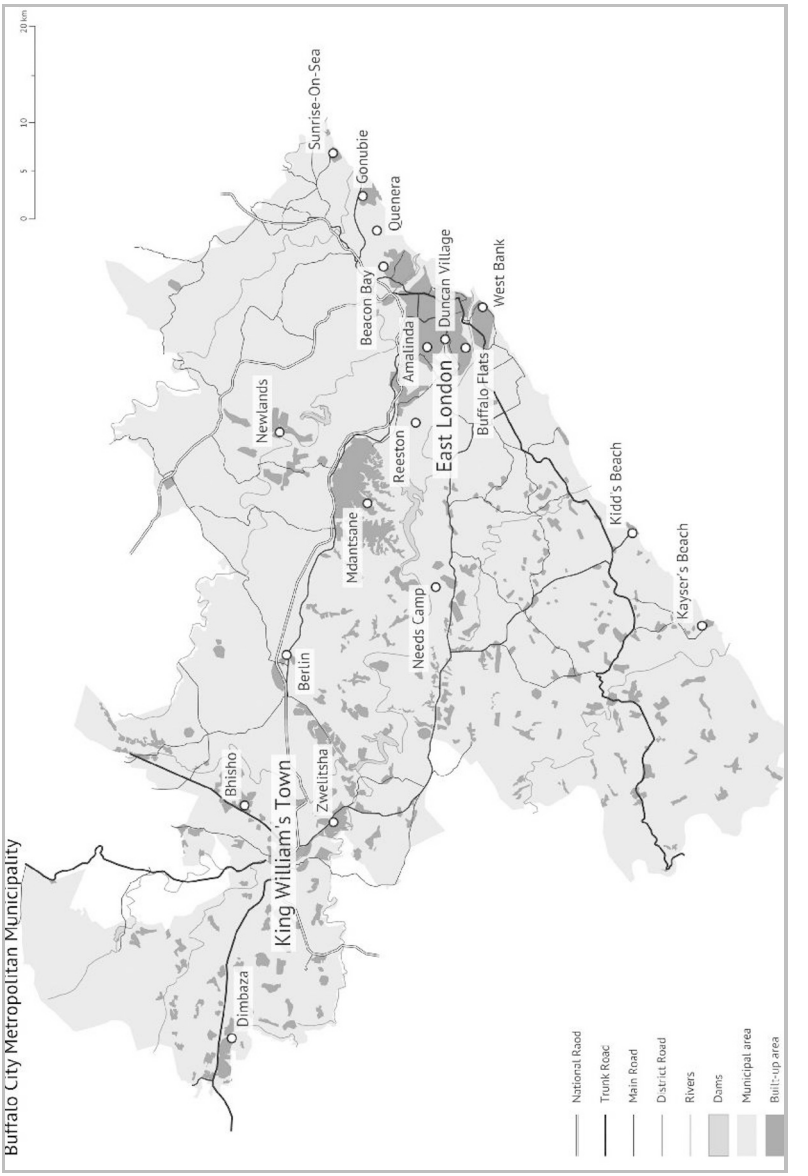
yses of plans and budgets, aerial photographs, newspaper articles, and site visits, this chapter argues that the relocation that has taken place has created new vulnerabilities without doing away with those it was supposed to overcome.

Figure 1a: Metropolitan municipalities of South Africa.



Source: Cartography: J.T. Wongnam based on Map of South Africa with district borders, 2016.svg by Wikimedia Commons.

Figure 1b: Main places and built-up area in Buffalo City 2002.



Source: Cartography: J.T. Wongnam based on BCM 2002 (Map B1 study area).

SOCIAL AND ENVIRONMENTAL VULNERABILITY IN THE LOCAL CONTEXT

Buffalo City: A low-growth, high-inequality environment

With 810,528 inhabitants, Buffalo City is South Africa's seventh most populous municipality (StatsSA mid-year population estimates for 2016, cited in ECDoH 2018). The municipality was only formed in 2000 when East London, King William's Town, Bhisho (the former capital of the homeland Ciskei), several black townships and their rural hinterlands were merged. In 2011, Buffalo City was elevated to the status of a metropolitan municipality. As a secondary city surrounded by former homeland areas, it must be considered one of the 'areas under the biggest population pressure' (Van Huysteen *et al*. 2013, p. 5). Although population growth in Buffalo City has been well below the national average (0.69% compared to 1.44%; Stats SA 2011), the incidence of households living in informal settlements is significantly higher than in other metropolitan municipalities (17% compared to the 12% average for all metro areas; StatsSA 2013 cited by Graham *et al* 2014, p. 12). The apparent contradiction between modest population growth and the high incidence of shacks may indicate that rural migrants use the city as a 'stepping stone' on their way to Johannesburg or Cape Town, where GDP per capita and chances of finding a permanent job are both much higher (Graham *et al*. 2014, p. 11). Notwithstanding the migration flows, Buffalo City is characterised by a discomforting continuity of precarious housing conditions and 'more and more' land invasions (interview with a municipal planner, March 2018).

According to Makiwane (2011; cited by Dlani *et al*. 2015, p. 178), climate change could imply that the municipality is faced with 'more frequent and severe flooding as a result of higher intensity storm events [...]. This will impact on human settlements, infrastructure, human health and place a greater burden on particularly impoverished communities.' The city's climate change strategy (BCMM 2014, p. 44) highlights the potential impact of increased precipitation on informal settlements located on flood plains; the strategy recommends city planners 'remove shacks in flood-prone areas [and] promote climate resilient settlements' (among others). Its authors also think it is 'likely' that droughts will intensify and it is 'almost certain' that there will be more extremely hot days with major consequences for vulnerable people and municipal infrastructure, possibly leading to an increased cost of water services (ibid., p. 126). Thus, they recommend "smart growth" planning a strategy that highlights high density, mixed-use, transit-oriented development [...] and directing city resources toward

existing communities rather than diverting them to new development in outlying areas' (ibid., p. 81). The following case study shows that the municipality is still far from implementing these recommendations.

Duncan Village as a site of struggle and social deterioration

The highest concentration of informal structures can be found only five kilometres from the East London Central Business District (CBD), in Duncan Village, a township in the municipality of Buffalo City, Eastern Cape Province, South Africa (Figure 1). The area, originally known as the East Bank has been the main location of the country's black workforce since the 1880s and it has remained the primary scene of the local housing crisis since the industrial boom in the early twentieth century. The history of Duncan Village may be recounted as having been a sequence of failed attempts at urban renewal, starting with the construction of several hundred municipally managed rented homes in the early 1940s, under Governor-General Duncan, to whom the area owes its name. As the government could not do away with the village's wood and corrugated iron shacks, 'overcrowding and squalor' was blamed for a terrible tuberculosis epidemic (Ntsebeza 1993). In 1952, after police brutally dissolved an African National Congress (ANC) gathering, the area erupted in violent riots that were followed by a police massacre (Mager and Minkley 1993; Bank and Carton 2016).

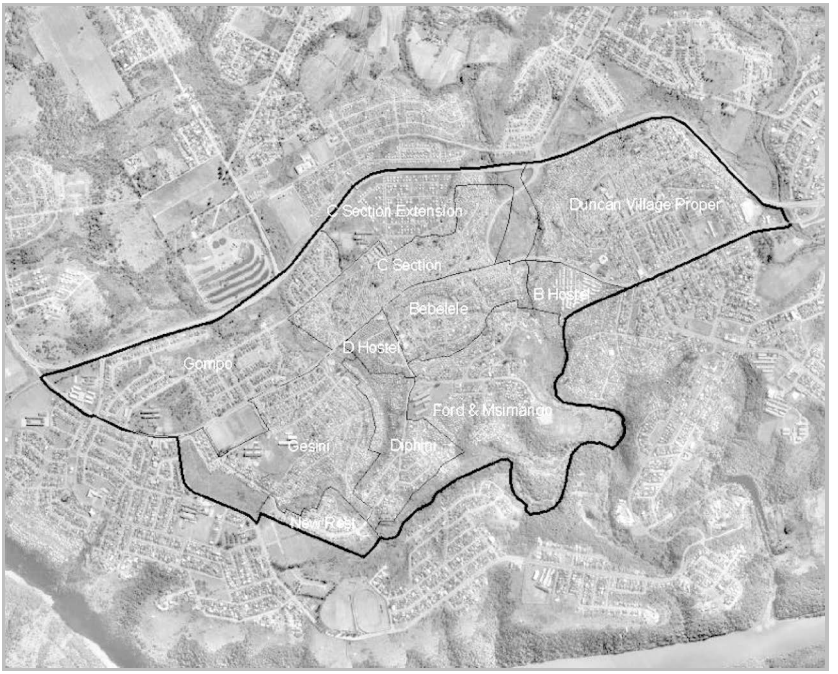
For several decades, the East London council attempted to restructure the area in accordance with the Group Areas Act of 1950. Political activists and people without residence permits for the urban area were deported, black and coloured inhabitants were separated, and the old location was demolished. Duncan Village was supposed to become a settlement of standardised cottage housing where only married men with secure jobs were allowed to stay (Bank 2011, p. 70). In the 1960s and 1970s, the apartheid government built Mdantsane, a huge dormitory town 25 km outside of East London. The government's intention was to remove people from East London's urban areas and mitigate any future rural-to-urban migration. Although at least 8,000 families were displaced from the city (ibid., p. 194) and three quarters of the old East Bank locations were broken down, the state never completed these intended relocations. In 1985, the killing of an anti-apartheid leader sparked a new rebellion. Government forces committed another massacre but lost control over the township. The well-organised Duncan Village Residents' Association (DVRA) galvanised resistance and 'open[ed] up the township for immigration from surrounding rural areas' (ibid., p. 90). Effectively replacing state authority, the DVRA allowed shacks to be

erected in backyards and open spaces, resulting in a population that had more than doubled by the time of the first democratic election in 1994.

In order to 'deliver concrete benefits to violence torn and crisis driven communities in major urban areas at an early stage' (SACN 2003, p. 38), the Government of National Unity embarked on six Special Integrated Presidential Projects (SIPP) and Duncan Village became one of them. Despite the local community's mistrust of the city administration, in an interview conducted in June 2015, the former project manager noted that a lot was achieved: '... we almost had to respond to crisis: Install new bulk infrastructure, build new roads, we even organised new schools, clinics, early childhood development centres, an old age home – still standing today!' Yet, as the project only built 1.000 housing units, it could not do away with the precarious conditions created by apartheid and mass migration. The persistence of high population densities and makeshift housing made Duncan Village highly vulnerable.

The biggest risk was people's dependency on paraffin (petroleum) for light and heating. According to Bank (2011, p. 102), between 1986 and 1992, alone, there were 208 fires in Duncan Village, destroying at least 1,151 huts. During the next six years, the number of destroyed huts doubled, probably due to a further increase in building density, and more than thirty people died. According to an evaluation done for the Human Sciences Research Council, the SIPP had intended to reduce the fire risk by connecting 5,000 illegally constructed buildings to the electrical grid, but electricity was too expensive for the inhabitants (Morrow and Engel 2003, p. 18). In contrast, the city council rejected the electrification of informal settlements even as a provisional measure and, thus, bears responsibility for the continued occurrence of tragedies (Bank 2011, p. 216). A particularly bad fire in June 2001 destroyed more than 400 shacks and killed a young girl. One year later, in August 2002, Duncan Village was hit by heavy flooding when two rivers that ran through the area overflowed. Thirteen people died, 3,000 were left homeless, and infrastructure and buildings worth R100 million (USD 16.6 million) were destroyed (FHISER 2004, cited by Kay 2005, p. 62). For the newly formed Buffalo City, Duncan Village represented a disaster area that needed massive intervention (Figure 2). According to one of the area's council representatives, there was 'intense pressure' to build housing in Duncan Village as quickly as possible (Kay 2005, p. 30).

Figure 2: Duncan Village study area as defined by the Local Spatial Development Framework.



Source: Kay, 2005, p. 17.

The growing impoverishment also added pressure. Due to the abolition of state subsidies to homelands industries after the 1994 elections and the resulting corporate closures, the whole region suffered from deindustrialisation. Thousands of unskilled and semi-skilled jobs were lost. While in the 1950s only a fifth of adults in Duncan Village were jobless, in the mid-1990s almost half of the adult population was unemployed (Bank 2011, p. 111). Despite the investments the SIPP made and the general recovery of the South African economy in the late 1990s, in 2001 only 17.5% of the residents were formally employed and only 11% earned more than R1,600 per month (then about USD 200) (BCM 2009, p. 27). With the term 'hyper-ghetto', taken from Wacquant (2008), Bank characterises Duncan Village as a racially stigmatised space trapped in a downward spiral within a post-industrial city (2011).

Duncan Village between redevelopment and relocation

In order to improve living conditions and reduce vulnerability in the area, in late 2003, the municipal planning department started to elaborate a local spatial development framework (LSDF). The plan aimed at a holistic renewal described as the Duncan Village Redevelopment Initiative (DVRI) in which the construction of state-subsidised housing was to gradually replace the area's shacks.[2] Due to the housing stock's high density, it was clear that the traditional typology of free-standing minimum-standard houses could only accommodate a very small proportion of the local population. Therefore, local urban planners, consultants and councillors agreed on the development of terraced row and semi-detached housing (Figure 3).

Figure 3: Duncan Village urban and housing design by The Matrix, commissioned for the Local Spatial Development Framework.

Source: BCMM 2013b, p.93.

2 It also included the pedestrian-friendly rebuilding of the main transport corridor, the creation of a multifunctional social infrastructure and the promotion of economic activities (Kay 2005, p. 66).

However, the people to be affected had little say in the planning process. Participation was always filtered through the elected ward councillors and thus was prone to political interference (Kay 2005, pp. 109–110; 113–116).[3] As newly elected leaders insisted on favouring native inhabitants over 'newcomers', the density target was reduced. In turn, both the number of families that should have been relocated and the need for suitable land increased (interview conducted 28 May 2015; BCM 2009, p.88; Ndhlovu 2015, p. 59).

According to the LSDF, over a period of twelve years at least 20,000 new homes were to be created. Only one-tenth of the new houses were supposed to be built in Duncan Village itself, yet even these were lacking in infrastructural prerequisites. The municipal engineering department insisted that new construction in Duncan Village and adjacent areas could only be permitted after the commissioning of a regional sewage treatment plant and the diversion of sewage to this plant. As long as these conditions were not met, only about 300 housing units were supposed to be built on this site. Almost 9,000 units were to be built on various sites within a ten-kilometre radius, but even these areas were subject to constraints. The only area where mass construction and resettlement could begin immediately was Reeston, the former buffer zone between East London and Mdantsane (see Figure 1). According to the planners, the area could accommodate more than 9,500 units. In other words, almost half of the population of Duncan Village was supposed to move to a no-man's land (BCM 2009, pp. 89–90, 164–168).

Reeston had been earmarked for low-income housing since the late 1980s (Reintges 1992). From a bird's eye view, the development of the area between the core city and its economically dependent satellite makes sense (Figure 1). However, if one were to have taken a closer look, one could have seen that Reeston was not very suitable for residential development. Deep valleys with irregular shapes and steep slopes prevented coherent development. The ridges where the housing was to be built upon, without the need for expensive foundations, were very narrow (Figure 4). Nevertheless, between 1996 and 1997, plans to develop Reeston were revived (interviews conducted 28 May and 10 June 2015). Even before work on the Duncan Village LSDF had begun, the Integrated Development Plan of 2003 to 2004 had earmarked more than R110 million (USD

3 Based on a 'qualitative attitudinal survey' and a series of consultative meetings (BCM 2009, p. 8–9; 31–33), municipal planners had concluded that 'many people are tired of the constant anxiety and suffering [...] and are becoming more willing to allow the government to provide a formal house located on a safer piece of land even if that means moving out of Duncan Village' (Foster 2004, cited by Kay 2005, p.63).

14 million) for housing construction in the area (BCM 2003, p. 32). Long before the Duncan Village LSDF had been officially adopted, Buffalo City Municipality (BCM) had begun relocating flood and fire victims to Reeston. Further, resettlement was seen as the only option for de-densification and a comprehensive redevelopment in Duncan Village.

Figure 4: Unfavourable topography for low-income housing development in Reeston (Buffalo City).

Source: Google Earth, Image © 2019 Maxar Technologies.
(aerial picture taken 17 May 2018; label 'New Life' added by the author).

Reeston as an example of state-subsidised urban sprawl

Since the early 2000's, Reeston has gradually been developed as another dormitory town that consists of far-flung single-family homes that were built to provide basic needs (Figure 5). However, building standards for the state-subsidised sector have improved over the years. At the beginning of the initiative, government-built houses consisted of corrugated iron roofs but not plaster walls with insulation; now, roofs are tiled and houses are insulated. However, the built environments that have been created still have an eerie resemblance to the apartheid-era township of Mdantsane, which has been described as a monotonous place 'marked by uniformity and separation, by loneliness and hardship, by starvation and unemployment and distance' (Minkley 1999, p. 217). Formal investment is limited to houses, internal roads, basic infrastructure (electricity, water,

sanitation) and a few schools. All other functions that contribute to the village's social life and everyday commodities are provided from transport containers or shack-like structures, similar to the informal settlements Reeston was supposed to replace. (Using state-subsidised houses as shops is considered a misappropriation.) Fifteen years after construction began, it is obvious that the education infrastructure is insufficient as hundreds of school children rely on busses or long walks to attend schools in the town and the only secondary school that was established in Reeston has been extended again and again with corrugated iron structures.[4]

Figure 5: Unauthorised shop operating from a state-subsidised house in Reeston, Phase 3, Stage 3 ("New Life").

Source: Author, 2016.

4 On the basis of government-defined ratios, the authors of the DVLSDF had estimated that there would be a need for twelve elementary schools, five secondary schools, six health centers and two police stations, once the city extension area has reached its target population of 54,500 inhabitants (BCM 2009, p. 103). Due to the lack of coherent official reporting, it is difficult to establish the size of the current population. Based on a May 2015 estimate by a senior housing official, augmented by the recently built settlement known as "New Life" and assuming an average household size of 3.8 persons (a factor used by the municipality with regard to informal settlements), the area may now host more than 20,000 inhabitants. If the social facilities framework of the Duncan Village LSDF had been followed, then at least five primary schools, two secondary schools and two clinics should have been operational by now and a police station should soon be built.

The new housing development certainly does not match the criteria for a 'climate resilient settlement' formulated by the city's own climate change strategy (see above). Its density is too low, there is no mixed-use development and development was carried out without considering people's transport needs. While, so far, Buffalo City has been spared the crisis-level water shortages experienced, in September 2017, in Cape Town due to falling water levels in storage dams; Buffalo City also introduced water restrictions (Daily Dispatch, Sept 8, 2017). If droughts intensify in the future, then they are likely to be felt more severely in an area like Reeston, where almost the entire population depends on a free basic water quota and the low-density detached housing provides little shade.

While those parts of Reeston that are close to the watershed and the main transport artery[5] may be considered reasonably well-located, inhabitants at the bottom of the ridges are not better off than those who had to relocate to Mdantsane in the 1960s or 1970s. Although distributor roads connect the neighbourhoods to the main road, people are even more dependent on the core city than those living in the apartheid-era township, due to the difficult topography and the almost total lack of amenities and commercial activities. The situation is worse in an area officially described as 'Reeston Phase 3, Stage 3' but coined 'New Life' in the vernacular (see Figures 4 and 5). All interior roads were tarred but the main road linking the township to the rest of the city is gravel, which damages cars that are used as taxis, making some taxi drivers reluctant to travel to the area (Daily Dispatch, May 9th 2018). As people living far from the corridor must pay two taxis to take them to town, Reeston is a poverty trap for inhabitants who cannot afford to travel where they may find work.

Although former municipal planners defend their work, stating that they have made provisions for clinics, schools and commercial sites, no one claims to be proud of the outcome. Some blame other government departments for failing to 'follow housing development'. Others describe the project as a mistake 'because in Duncan Village, at least [... people] were close to working opportunities, your taxis, your transport and schools.' Yet, even planners who concede that Reeston is 'a bad example; or a good example of what not to do' seem to see no chance

5 Both Mdantsane and Reeston are located south of the watershed between the rivers Nahoon and Buffalo. Both areas are intersected by irregularly shaped valleys that have formed in the catchment area of the Buffalo River. Good access is only provided in the North, as the railway line between East London and King William's Town, the National Road No. 2 and the older R102 (the so-called Voortrekker Road) all follow the watershed.

to correct the error, stating that 'they have started on it, so we have to see it through now' (Interviews conducted 29 May and 10 June 2015).

Running to stand still: The persistence of informality in spite of housing allocation

The number of households from Duncan Village that have benefitted from this state-subsidised housing programme is unknown. Astoundingly, there are no official figures about relocation. According to a senior human settlement official, by mid-2015, around 4,500 households had moved to Reeston (Interview conducted 28 May 2015). Since then, 1,137 additional housing units were completed in 'New Life'. The construction of another 2,500 units was suspended when the procurement process was challenged (BCMM 2015a, p. 103).

Despite massive expenditures for infrastructure provision and housing in Reeston and other projects in the municipality, Buffalo City Metropolitan Municipality (BCMM) has not managed to reduce its precarious housing conditions. Based on the BCMM's annual reports, the average number of low-income housing units produced between 2007 and 2012 was calculated as 1,438. At this rate, it would take more than 50 years to fill the backlog and provide for future need (CS Consulting / Afesis-corplan 2014, p. 8). By 2015-2016, the municipality had only completed 936 'top structures' (BCMM 2017, p. 15). In Duncan Village, in particular, the municipality had hardly made any progress in reducing its precarious housing conditions. This was also acknowledged by the current portfolio councillor for human settlements who explained:

'... we planned for the redevelopment of Duncan Village [...] but the challenge is the influx. [...] there is land invasion, which is the crisis in the whole metro. [...] As human settlements we are doing our job as per the mandate, but we still have no control measures to stop people rebuilding shacks' (Interview recorded 16 November 2016).

Municipal officials from the planning and engineering departments blame political interference and the housing department's lack of sophistication for the municipality's inability to defend the spaces it created through relocation. One of the planners explained that, in order to fulfill his mission, the developer contracted by the municipal human settlements department would have to perform three tasks at the same time: while homes are being built at Reeston, residents of Duncan Village would have to be moved, block-by-block, into so-called temporary relocation areas and at these vacated places the company would then need to immediately begin preparations for new construction:

'You got to clear a block at the bottom of the hill because your sewerage pipe will work up as you go [in order to gradually connect houses to the sewer system]. [...] And you have to be building houses here at the same time that you are building elsewhere; because of these [issues], 1,000,500 would come back to Duncan Village, 500 would be built in Reeston, roughly, and then there is still the question of these guys [residents who have no right to a state-subsidised home]. So, you got to be building in two places at once. You've got to have your admin organised because you have to move people to a TRA [temporary relocation area]; make sure that no extra people arrive in that TRA; it's only the people from that block; and then you got to work out: 'From you guys, who wants to go to Reeston? Who wants to come back to Duncan Village?' and who's not going to qualify. And you got to have a place for all three. [...] You gotto have a production line. Eesh – it's not happening' (Interview conducted 29 May 2015).

The concept of block relocation was already well formulated during the planning process (Kay 2005, p. 152). However, political interference in the processes of beneficiary registration and housing allocation undermined implementation. According to a senior official from the engineering department:

'[T]he councillors have got in and they said: 'no, you cannot only help one area!' So, instead of taking 1,000 people, they would take 50 there, 50 there… the area was still too dense! [...] The whole plan fell through because it was not done in a systematic way' (Interview conducted 17 July 2018).

Even a former portfolio councillor who was responsible for housing allocation acknowledged that "people were identified, registered and then approved [without...] taking into consideration the block movement". Yet, according to her account, this practice has now been stopped, and the only reason the DVRI still has not been able to reduce the number of informal structures is that construction was stalled after litigation over procurement processes (Interview conducted 08 March 2018).

Be that as it may, in terms of disaster risk reduction, the project was not very successful. As is evident from the analysis of aerial pictures, 15 years after the floods of 2002 even some areas inside the 100-year flood lines are still being invaded. While re-naturalisation along the Amalinda River has managed to reduce the risk of another natural disaster, areas along the Umzonyana River, which were empty when the 2013 aerial picture was taken, have since been reoccupied (Figures 6a, b and c).

Figure 6a: Excerpt of 1-in-a-100-year floodlines included in the Duncan Village Local Spatial Development Framework showing the Gesini settlement on the west bank of the Umzonyana River before the floods of 2002.

Source: BCM 2009, p. 35.

Figure 6b: Aerial picture taken in 2013.

Source: Buffalo City Metropolitan Municipality (unpublished).

Figure 6c: Aerial picture taken 31.10.2017.

Source: Google Earth, Image © 2019 Maxar Technologies.

Everyday risks: The reluctant delivery of basic sanitation and electricity services

Even after the launch of the DVRI, living conditions in Duncan Village's informal areas remained appalling. Many people who were living in shacks relied on public toilets from the apartheid era and the so-called bucket system. Even if the redevelopment plan had been followed to the letter, many inhabitants would have had to wait a decade before they could have got a fully serviced house. Still, there was no plan for interim measures. In May 2009, a study by the Eastern Cape NGO Coalition showed that, on average, 333 shack dwellers had to share one public toilet (Daily Dispatch, 19 May and 27 May 2009). Angry community protests against the lack of service delivery made it clear that, fifteen years after the first democratic elections, shack dwellers had lost patience waiting for fully serviced housing (Daily Dispatch 28 July 2009 and 18 March 2011). During the next three financial years, Buffalo City provided 26 'movable ablution blocks'[6] (BCMM 2011, p. 45; BCMM 2013a, p. 59). Yet, as the lack of maintenance and security persisted (Mbi 2015), it is no wonder that service-delivery protests became a common feature in the area (Mukwedeya 2016).

6 Although locally described as 'ablution blocks', the sanitary facilities do not provide showers or wash rooms but only public toilets and open-air sinks.

The other main source of vulnerability continues to be the lack of access to safe energy, which causes a permanent risk of shack fires. In keeping with South Africa's progressive Bill of Rights, the ANC government introduced a policy of free basic services for households whose income fell below certain thresholds. Part of this policy consisted of a monthly allowance of 50 free kWh of electricity. Since free basic services could only be delivered to households that were connected to the respective (electricity, water and sanitation) networks, shack dwellers missed out on most of what should have been provided by law. Yet, they developed an impressive ability to illegally tap into these networks.

In the 2009/10 financial year, the Buffalo City administration reported a dramatic increase of illegal electrical connections, called izinyoka (snakes) in the Xhosa language. In reaction to this development, the council decided to pilot the electrification of informal dwellings in Duncan Village (BCMM 2011, p. 41). Since the municipality depended on co-funding from the national government, the electrification of shacks only began in earnest in 2013/14. Since then, the municipality has connected more than 5,600 households in informal settlements, including more than 1,600 in Duncan Village (Figure 7). However, the official electrification process also clashed with 'illegal electrical connections, which cause[d] delays on site as they [had] to be removed before work [could] proceed; theft of copper [...and] vandalism to equipment' (e-mail communication with BCMM Electrical and Energy Services Department, 15 August 2018). Therefore, the BCMM electrical department drew up a restrictive list of minimum criteria for electrification[7] that cast uncertainty about the future of the programme.

7 Easements, flood-prone areas and private land are considered off limits. In order to avoid wasteful expenditures, the department expects assurances that 'the community supports the proposal and is willing to co-operate with the opening up of access roads where necessary [...], keep these access roads clear; supply and organize local labour where required; and help prevent tampering with or on-selling of electricity supplies'. It also requires a 'formal layout' from the municipal planning department. The general manager is clear that 'many informal areas do not and will never meet [...these] requirements' (e-mail correspondence, 17 August 2018). Although several parts of Duncan Village have been connected to the grid, he has no optimism that this will continue: '... in some areas it is so dense, [...] you have got to walk through one shack to get to the neighbour behind you. [...] So, we cannot get electricity in there' (interview conducted with BCMM Electrical and Energy Services Department, 17 July 2018).

Figure 7: Electrification of informal settlements in Duncan Village.

Source: author, 2015.

Figure 8: Illegal electricity connections on the floor of a dwelling in Amalinda.

Forest (Buffalo City).

Source: author, 2018.

Meanwhile, every year in Buffalo City, between 2012 and 2015, there have been more than 180 so-called 'informal fires' that literally happened 'every other day'. In most cases, the cause of the fire was not reported. Where a cause was indicated, candles appear to have been the major cause, followed by arson. An analysis of the fuel type used in the affected households seemed to indicate that electricity-related problems (exploding electrical cords; illegal connections; burnt-out switches, etc.) surpassed paraffin as the major cause of fires8 In 2013/14 alone, 16 people lost their lives due to 'informal fires'. In 2014/15, this number dropped to 6 (BCMM 2015b, pp. 23–31).

According to a council report cited in the local newspaper, between July 2016 and February 2017, alone, the metro lost R95.8 million (approximately USD 7 million) in revenue from electrical generation due to illegal connections. At the same time, it was reported that 63 people had been killed by illegal electricity connections in the municipality's informal settlements over the three-year period from 2014 to 2017.

'The settlement hardest hit by electrocution deaths is Duncan Village which has recorded 20 between 2014 and 2017, followed by Mdantsane which has recorded 10 deaths. The ages of the victims range from two years to 48 and most of those who die are male' (Daily Dispatch, 19 June 2017).

These reports show that even after the initiation of the municipal electrification programme, people who are living in shacks still risk their lives (and those of their neighbours) to get free access to electricity. Given the programme's slow pace and restrictions, some may never benefit from it and feel conflicted between waiting to obtain a safe, legal connection to the electrical grid or risking the dangers of using paraffin against those of izinyoka. In any case, they are subject to everyday risks that may appear much higher and certainly more immediate than those looming from climate change.

CONCLUSION

The paper has traced the history of Duncan Village, an iconic black working-class neighbourhood which successfully resisted the racist relocations of the apartheid era but has become increasingly impoverished. This condition has

8 This interpretation is tenuous since information about the fuel type was available in less than 15% of incidents.

hardly improved through the recent redevelopment efforts that have taken place since the new millennium. This shows that local planners faced with overcrowding and natural and everyday disasters saw no alternative but to conduct a new massive relocation programme to a peripheral area. Since the new settlements were only serviced with the most basic infrastructure, due to their lack of integration in the local economy and the prohibitive costs of transport, resettlement has created new vulnerabilities for these inhabitants. The perpetuation of urban sprawl through low-income housing is also problematic in terms of climate change because the dominant settlement typology is already resource-inefficient, so if Buffalo City has less water available in the future it will be even more difficult to service this population.

Meanwhile, attempts at de-densification in Duncan Village have failed, partly due to the low pace of new housing construction and partly due to a disingenuous resettlement process that has failed to carry through the block clearance the planners had promoted. Again and again, new informal housing filled spaces that were opened up by the relocation of shack owners. Municipal officials and local politicians provide different explanations for this phenomenon. No matter whether people allocated to housing in Reeston sub-let their new housing or rented out their former shack, no matter whether the space that was vacated became occupied by a rural migrant or a youngster who could no longer stand living in a shack with his parents or aunt, the trend in reoccupation points to the high demand for a place to live in the city and the fact the state-subsidised housing programme is nowhere close to filling this gap.

The DVRI was established on the premise that government would be able to replace the informal housing in Duncan Village and create infrastructural preconditions for its redevelopment over a twelve-year period. Fifteen years after the start of the planning process and nine years after the formal adoption of the plan, these assumptions need to be reassessed. Given the balance of the initiative so far, there is a strong argument for shifting the focus toward the provision of interim services and disaster management in informal settlements in Duncan Village and beyond. The projected risks of climate change point in the same direction: If municipalities are serious about reducing the risk of disaster, then they must start by accepting the status quo and focus on energy safety, water and sanitation, the clearance of flood-prone areas and the implementation of basic systems of storm-water management. Although the relationship between energy safety, shack fires and climate change may be indirect, given the number of lives lost due to fires and electrocution, climate-change adaptation in a poverty-ridden area like Buffalo City must be balanced with or include the reduction of such everyday risks.

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