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Assessing Place Attachment and Climate Adaptation through
Urban Greening: The Impact of Greenpop's Green Zone Project
in Philippi, Cape Town.

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I. Abstract

Abstract (English)

Although climate mitigation dominates global discourse, adaptation receives limited attention and resources, particularly in Africa. Marginalized communities in regions such as South Africa face compounded socio-economic and climate-related vulnerabilities. Thus, this thesis investigates the interplay between green adaptation, place attachment, and (im)mobility, using *Greenpop's Green Zone* project in Philippi, Cape Town, as a case study. Place attachment is examined as a critical factor influencing adaptation responses. Within this framework, 15 semi-structured interviews are conducted with three key stakeholder groups, complemented by stakeholder mapping and an extensive literature review.

The findings indicate that the project strengthens capacities across all dimensions analyzed, thereby enhancing pride, collective ownership, and environmental awareness and providing modest economic benefits. However, long-term adaptation remains vulnerable to structural constraints, including violence, insecure tenure, and limited institutional support. Despite alignment with South Africa's National Adaptation Plan, integration into formal governance is inadequate.

The study highlights the importance of pairing adaptation with economic opportunities and recognizing the role of place attachment in shaping responses. By emphasizing participatory, community-driven interventions, this research contributes to a nuanced understanding of how socio-psychological and structural factors intersect with green adaptation projects to influence adaptive capacity and mobility decisions in marginalized settings.

Abstract (Deutsch)

Obwohl Klimaschutz weltweit im Mittelpunkt der Debatte steht, erfahren Anpassungsmaßnahmen insbesondere in Afrika nur wenig Beachtung und Ressourcen werden unzureichend zugestanden. Marginalisierte Gemeinschaften in Regionen wie Südafrika sind mit einer Vielzahl sozioökonomischer und klimabedingter Herausforderungen konfrontiert. Die vorliegende Arbeit untersucht daher die Wechselwirkungen zwischen grüner Anpassung, Ortsverbundenheit und (Im-)Mobilität am Beispiel des *Greenpop*-Projekts *Green Zone* in Philippi, Kapstadt. Ortsverbundenheit wird dabei als kritischer Faktor betrachtet, der das Anpassungsverhalten beeinflusst. Im Rahmen der Datenerhebung wurden 15 halbstrukturierte Interviews mit drei Hauptstakeholdergruppen durchgeführt, die ergänzt wurden durch eine Stakeholder-Analyse und eine umfassende Literaturrecherche.

Die Resultate der Analyse zeigen, dass das Projekt die Anpassungskapazität in allen analysierten Dimensionen stärkt und dadurch das kollektive Verantwortungsbewusstsein, Gefühle wie Stolz und das Umweltbewusstsein fördert sowie moderate ökonomische Vorteile bietet. Die langfristige Anpassung bleibt jedoch anfällig für strukturelle Einflüsse, darunter Kriminalität, unsichere Besitzverhältnisse und begrenzte institutionelle Unterstützung. Obwohl eine Übereinstimmung mit dem Nationalen Anpassungsplan Südafrikas besteht, ist die Integration in die formale Regierungsführung unzureichend.

Die vorliegende Studie betont die Relevanz einer Verbindung zwischen Adaptionenprojekten und wirtschaftlichen Chancen. Zudem wird die Bedeutung von Faktoren wie der Ortsverbundenheit bei der Gestaltung solcher Projekte hervorgehoben. Die vorliegende Forschung trägt durch die Betonung partizipativer, gemeinschaftsorientierter Maßnahmen zu einem differenzierten Verständnis der Zusammenwirkung soziopsychologischer und struktureller Faktoren im Rahmen grüner Anpassungsprojekte bei. Zudem werden die Beeinflussung der Anpassungsfähigkeit und der Mobilitätsentscheidungen in marginalisierten Umgebungen durch diese Faktoren erörtert.

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1 Introduction

Climate change will and already is altering environmental conditions as well as frequency, intensity, and timing of extreme weather events, leaving vulnerable communities most affected (Opitz Stapleton et al., 2017; UNDP, 2024; Von Maltitz et al., 2024). Considering climate change models for Southern Africa, countries in this region are projected to experience significant temperature increases and decreases in precipitation, with South Africa and Namibia being especially prone to freshwater shortages (Von Maltitz et al., 2024). Simultaneously, South Africa is expected to experience an increase in flooding events. Researchers have emphasized the urgency in this regional context (Von Maltitz et al., 2024, p. 169):

The southern African climate is at risk of tipping into a new regime, with unprecedented impacts, such as day-zero drought in the Gauteng province of South Africa, collapse of the maize and cattle industries, heat waves of unprecedented intensity and southward shifts in intense tropical cyclone landfalls.

Along with mitigation efforts (i.e., reducing GHG emissions to mitigate temperature increase), global and regional strategies must include adaptation plans to “reduce vulnerability and ensure individuals, communities and countries have the necessary skills to cope with and respond to climate-related hazards”, according to the UNDP (Opitz Stapleton et al., 2017). Adaptation strategies are multifaceted and depend on the local geographical context. One may distinguish between in-situ adaptation, which addresses communal needs in the face of climate change and locally increases livelihoods, and migration as adaptation, such as planned relocation regimes (Opitz Stapleton et al., 2017). To help communities sustain livelihoods in a place they might have called home for multiple generations and avoid sudden displacement, researching success factors for adaptation is crucial (Jamero et al., 2019). Efficient adaptation projects may reduce vulnerability, build capacity for communities to stay and adapt, or enable voluntary migration choices: “By reducing overall vulnerability, in-situ adaptation transforms mass migration into a choice, rather than an inevitability.” (Jamero et al., 2019, p. 7).

Southern Africa is viewed as a prime example of the water-energy-food interlinkage, with changing rainfall patterns exacerbating environmental (e.g., droughts, floods, pest infestations) as well as social risks (e.g., water stress, loss of livelihoods, food insecurity) (Mbiyozo, 2021). Simultaneously, Africa is expected to experience the highest rates of urbanization until 2030, with South Africa showing the 10th highest urbanization rate, 69% to be precise, in 2023 (Statista, 2023). In this local context, green infrastructure plays a crucial role in climate adaptation, not only to sustain ecosystem service provision and reduce urban heat but also for small-scale agriculture (Venter et al., 2020).

Vastly uneven urban development patterns, rooted in colonialism and reinforced during the Apartheid era, have produced townships and informal settlements with shortcomings in basic service delivery and public infrastructure (Peirson & Ziervogel, 2021). Thus, urban green spaces can be viewed as visual indicators of economic and racial inequality. Moreover, well-resourced neighborhoods exhibit a significantly higher proportion of clean, green spaces in comparison to under-resourced neighborhoods (Wolch et al., 2014). This is due to historical racial segregation but remains persistent today, partly because of variabilities in income, race, level of education, and the marginalization of residential groups (Chang, 2024). State-of-the-art research on urban development stresses that natural spaces must be incorporated into the urban landscape to support livelihoods in socio-economically challenged areas. Venter et al. (2020, p. 11) emphasize: “there is sufficient evidence, alluded to in the Sustainable Development Goals, to show that the ecosystem services derived from green infrastructure are fundamental for socio-economic development and general human wellbeing”.

However, urban green spaces not only provide local functions for ecosystems and social systems. They may be an influencing factor at the behavioral and attitudinal levels when it comes to capacity building for populations affected by environmental change. Research points to urban greening influencing residents’ *sense of place* or *place attachment* (Venter et al., 2020).

Wolch et al. (2014, p. 81) define place attachment as a dynamic concept that “emerges through personal experience with the environment” and that may empower communities to

care for local spaces and adapt to environmental changes. It is a complex and dynamic concept as factors such as extreme weather events and climate change-related hazards, simultaneously, have the ability to alter the characteristics of place attachment (Quinn et al., 2015). The socio-psychological factor of place attachment has not yet been studied thoroughly in connection with green adaptation measures but understanding these cause-and-effect relationships has the potential to build more impactful adaptation projects while leveraging local environmental stewardship. Moreover, residents' attachment to a place influences their mobility decisions in the face of adverse environmental conditions (Adams, 2016). A study by Adams (2016) revealed that 23% of residents who were dissatisfied chose to stay rather than relocate, with place attachment being a key factor in this decision. In connection with place attachment's influence on environmental stewardship, as discussed previously, this may point to a behavioral pattern of voluntary immobility and adapting in-situ rather than choosing to migrate as an adaptation strategy in the face of climate change.

In South Africa, the award-winning Cape Town-based non-profit organization Greenpop addresses the issue of limited green space in townships by implementing urban greening and ecosystem restoration projects (Greenpop, 2024). The present thesis will use Greenpop's urban greening site in the township of Philippi in Cape Town as a case study for the dynamic interplay between adaptation, place attachment, and (im)mobility response. Sitting within the Living Landscapes Initiative, the *Green Zone* project was initiated in September 2023, with the aim of establishing five initial Green Zones in communities experiencing a lack of resources and green spaces in Johannesburg, Pretoria, Cape Town, and Durban in 2024. Each Green Zone includes Indigenous plants, recreational spaces, art by local artists, and complementary infrastructure to make these spaces functional and welcoming for community events and workshops centered around ecology (Greenpop, 2024). Additionally, the selected research site in Philippi displays special characteristics as it is situated at the grounds of an NGO lead community space and entrepreneurial hub, *Philippi Village* (Badenhorst, 2025).

By employing a qualitative research design, this study aims to gain a more nuanced understanding of the connection between place attachment and adaptation in South Africa to broaden the understanding of what it takes to help vulnerable communities successfully adapt

to climate change. It assesses how the Green Zone in Philippi builds capacity for community-led adaptation efforts, inherently addressing aspects of voluntary and involuntary immobility.

Guided by Adam's (Adams, 2016; Gurney et al., 2017) critical research on place attachment in the face of environmental change, the central research questions are:

- *Why do communities persist:* Does the Green Zone influence place attachment?
What drives the decision whether to adapt in-situ or migrate in this local context?
- *How can they thrive:* How does the Green Zone address context-specific vulnerabilities and increase the community's capacity for climate change adaptation?
- *How can the findings help describe the dynamic interplay of adaptation, place attachment, and (im)mobility in this case?*

These questions are analyzed and discussed in seven chapters. Following the introduction, Chapter 2 develops the conceptual framework by reviewing key debates on vulnerability, resilience, adaptation, capacity building, climate (im)mobilities, and place attachment, before integrating the terms into an analytical lens. This conceptual interplay is reviewed again in Chapter 5 in light of the study's empirical findings. The subsequent chapter provides the geographical background, situating the case study within South Africa's urban development, characterized by the legacy of Apartheid, and discussing national climate policy. Chapter 4 outlines the methodological approach, including the research design, site description, stakeholder mapping and sampling along with ethical considerations. Chapter 5 presents the empirical results of 15 stakeholder interviews, thematically organized along the lines of vulnerabilities, capacities, place attachment, and (im)mobility. Finally, these findings are discussed in relation to the conceptual framework, providing implications and recommendations for practitioners and policymakers, as well as the limitations of the study. Chapter 7 concludes with a synthesis of the primary insights and an outline of potential avenues for future research.

2 Conceptual Framework

This chapter reviews the relevant discourse surrounding green adaptation and builds a conceptual framework by connecting the key concepts of vulnerability, resilience, adaptation, climate (im)mobilities, and place attachment. Together, these strands form the analytical lens through which the Green Zone in Philippi is examined.

2.1 Vulnerability, Resilience, and Adaptation

Understanding adaptation to climate change requires recognizing the contextual factors of vulnerability and social resilience (Adger, 2006; Smit & Wandel, 2006). Vulnerability reflects the degree to which a system is exposed and sensitive to climatic hazards, while resilience and adaptive capacity determine its ability to cope with, recover from, or transform in response to those stresses. As Smit and Wandel (2006) emphasize, adaptation is both a manifestation of and a pathway to strengthening adaptive capacity. This is achieved by reducing vulnerability through the enhancement of the system's resilience. In this sense, vulnerability and resilience form the conceptual foundation for examining adaptation processes, highlighting that local capacity to adapt is context-specific and shaped by broader social, political, and economic forces. Within this framework, nature-based or “green” adaptation approaches are increasingly promoted as strategies to build resilient communities (Venter et al., 2020; Wicander, 2024). However, as will be discussed in later sections, such interventions may also carry unintended socio-spatial consequences that can reproduce inequality rather than alleviate it – a risk that must be mitigated (Kim et al., 2024; Sax et al., 2022).

2.1.1 Vulnerability

Academic research of socio-ecological systems is characterized by a variety of conceptual approaches and terminologies, which this chapter is intended to clarify – most precisely *vulnerability*, *resilience*, and *adaptation*. Technical definitions of vulnerability by the IPCC and

similar institutions often focus on the pure susceptibility to hazards, for instance: “The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes” (Smit et al., 2001). Academics in the field of vulnerability research, such as Nick Brooks or Neil Adger, follow a more nuanced definition including the component of sensitivity (Adger, 2006, p. 270):

[...] vulnerability is most often conceptualized as being constituted by components that include exposure and sensitivity to perturbations or external stresses, and the capacity to adapt.

In other words, vulnerability describes the degree to which a system may be altered under adverse environmental conditions due to its internal characteristics and properties. Further, the component of adaptation refers to its ability to navigate this change and transition into a new state of equilibrium (W. N. Adger, 2006). The present thesis will adopt a location-dependent focus and view vulnerability of populations as “social condition” (Brooks et al., 2005, p. 154), meaning the degree of resilience to a hazard and how to increase it. However, Brooks et al. (2005, p. 153) define generic determinants of vulnerability, namely factors with regard to the developmental state, including poverty, indicators of poor health, economic inequality, or insufficient governance. It is crucial to specify determining factors according to prevailing hazards, additionally, geographic location, and cultural influences (Brooks et al., 2005).

Another central concept of social vulnerability research in the face of climate change is the *Sustainable Livelihoods* approach, first conceptualized and published by Chambers & Conway in 1992 at the Institute of Development Studies. In summary, *Livelihood* encompasses the essential elements for sustaining a means of living. It can be considered sustainable if it is able to withstand stress, recover from shocks, enhance capabilities, and provide lasting opportunities for the next generation (Chambers & Conway, 1992). The concept was developed further into the Sustainable Livelihoods Framework (SLF) by the British Department for International Development (DFID, 1999). Based on the framework, livelihoods are the basis for household well-being and are built on certain capabilities, assets, and activities. According

to Adger (2006, p. 272) livelihoods are often viewed interlinked with vulnerabilities, even though this may be critiqued: “Vulnerability in this context refers to the susceptibility to circumstances of not being able to sustain a livelihood”. He critiques this notion, emphasizing that

the framework mainly focuses on assets and capital, attributing vulnerability to a household’s consumption instead of ecological risk dimensions, for instance, climate change induced extreme weather events (Adger, 2006). Conceptualizing and measuring vulnerability remain a challenge in research and practice due to the lack of available quantitative metrics.

2.1.2 *Resilience*

While *resilience* originally stems from ecology and was defined similarly in the social context, namely as a measurement of the external change a system could tolerate and maintain a stable state, it is increasingly viewed as transformability (Keck & Sakdapolrak, 2013). Whereas the first definition focuses more on the persistence of communities, the latter aims to build capacity to dynamically bring about long-term change. A social system is seen as having multiple possible equilibria and can create new systemic pathways when ecological, economic, or social stresses disrupt the current systemic state (Keck & Sakdapolrak, 2013). These stressors may be acute hazards (e.g., droughts, floods, or storms), long-term changes in environmental conditions (e.g., water scarcity, climate variability), or development issues (e.g., socio-spatial transformation, economic crisis, pandemics). Keck & Sakdapolrak (2013) argue that resilience goes beyond coping with and adapting to stressors – it acknowledges change, crises, and uncertainty as constants in human lives. While coping, adapting, and transforming lie at the core of resilience, it must be acknowledged that barriers to transformation exist, rooted in societal power structures and inequality. Thus, adaptation strategies are highly context dependent, and increasing de facto participation of vulnerable actors is central (Keck & Sakdapolrak, 2013).

2.1.3 Adaptation

Climate adaptation broadly refers to the range of strategies that individuals, communities, institutions, and infrastructure systems employ to manage the impacts of climate change, aiming to reduce climate-related risks and increase resilience (Markanday et al., 2019). This thesis will specifically focus on improving social resilience. Climate adaptation is not only a policy item but a community-led societal process. Eriksen et al. (2011, p. 8-9) stress a sense of agency in defining adaptation as “the process or adjustments through which people reduce the adverse effects of climate on their health and well-being and take advantage of the opportunities that their climatic environment provides.”

On a global scale, the Paris Agreement, set in 2015, encompasses adaptation measures under the Global Goal on Adaptation, providing further frameworks and guidance for adaptation measures (UNDP, 2024). Increasingly, public funds such as the Green Climate Fund and the Least Developed Countries fund are set up to finance adaptation, especially in the Global South, but financing constitutes one of the major barriers to successful adaptation (UNDP, 2024). Markanday et al. (2019) critically reviewed the costs versus benefits of global climate adaptation measures and found that firstly, studies disproportionately focus on the Global North, which can lead to knowledge and financial resources flowing more towards Northern countries. Secondly, the authors stress that research on social measures such as community-centred approaches and capacity building is underrepresented compared to themes such as flooding mitigation approaches as well as grey- and green infrastructure. Locally, National Adaptation Plans (NAPs) integrate global goals with national development policies, financing strategies, and plans to empower communities (UNDP, 2024). Adaptation interventions differ widely per country and type, from socioeconomic approaches such as livelihood diversification to natural science interventions, for example, building seawalls or Indigenous forest restoration, or technological solutions such as early hazard warning systems (Mikulewicz, 2018; UNDP, 2024). Additionally, migration can be a successful adaptation measure (see Chapter 2.2). In informal urban settlements, with residents facing vulnerabilities on multiple levels, *nature-based solutions* such as gardening methods, biodiversity corridors, or wetland restoration are widely applied to tackle climate risks, food insecurity, sanitation, and social

cohesion simultaneously (Wolff et al., 2023). Additionally, adaptation measures can be distinguished by the actors involved. While top-down initiatives are imposed on communities by political authorities, private sector actors, or non-profit organizations, bottom-up approaches are initiated by vulnerable stakeholders based on lived experiences or established in a collaborative effort.

With adaptation encompassing such a broad range of strategies, policy makers and practitioners must address context-specific vulnerabilities effectively and avoid adverse developmental effects. Research distinguishes effective and ineffective adaptation, commonly referred to as *maladaptation* (Rouzaneh & Savari, 2024, p. 6). According to Rouzaneh & Savari (2024), adaptation can be further categorized as *successful* and/or *sustainable*. Even though there are no uniform criteria to assess the success of an adaptation project, it is commonly acknowledged that successful adaptation avoids or reduces damage that would have occurred otherwise, such as loss of livelihoods due to a climate hazard (Rouzaneh & Savari, 2024). However, it is argued that the success of an adaptation measure cannot be defined by its immediate effects but must be viewed in the broader context of sustainable development, to mitigate the risk of negative externalities and spillover effects or increasing vulnerabilities elsewhere (Adger et al., 2005).

In the case of maladaptation, an intervention addresses a certain hazard or vulnerability but inadvertently exacerbates existing social or ecological vulnerabilities or creates new ones (Rouzaneh & Savari, 2024; Adger et al., 2005). For instance, the installation of conventional air conditioning systems after a heatwave may provide short-term aid but may not be sustainable in the long term due to high energy consumption from non-sustainable sources that fuel climate change further (Adger et al., 2005).

A systematic review by Rouzaneh & Savari (2024) defines designing participatory, inclusive approaches, with an in-depth research and planning phase and the establishment of monitoring frameworks from the start, as key to avoiding adverse effects through adaptation processes. Moreover, attention should be paid to environmental education and capacity building to empower local stakeholders. Adger et al. (2005, p. 81) define similar principles of

success, namely: efficiency, effectiveness, and equity. Efficiency must not solely be measured by cost-effectiveness, as many benefits, such as preservation of cultural heritage or ecosystem services, do not adhere to market values. To avoid planning errors, investment decisions must consider the respective time horizon and possible climate variabilities. Moreover, power dynamics and initiators' positionality must be addressed from the start to ensure that a broad range of voices is included and the measures are rooted in community values. Frameworks and strategies to mitigate price surges, displacements, and other detrimental effects have been suggested by multiple academics (Kim et al., 2024; Kim & Stuhlmacher, 2024; Sax et al., 2022).

Mikulewicz (2018, p. 29) argues that adaptation will always be ineffective unless it tackles the origins of vulnerabilities instead of its manifestations "adaptation interventions to-date [...] have conceptualized vulnerability to climate change impacts as exposure to a natural hazard or a socio-economic issue by according insufficient attention to the political roots of vulnerability." The author thus argues for the "democratization of adaptation" (Mikulewicz, 2018, p. 29) and further research on the power relations between local community stakeholders and external actors in the implementation.

2.1.4 Green Adaptation

In the face of climate change and rapid urbanization, green spaces play a crucial role as an adaptation measure (Venter et al., 2020). Not only do they provide local functions, but they may even be an influencing factor on a behavioral and attitudinal level when it comes to adaptation decisions and capacities of communities affected by environmental change. State of the art research on urban development states that natural spaces must be incorporated in the urban landscape to support livelihoods in socio-economically challenged areas. Venter et al. (2020, p. 11) emphasize: "there is sufficient evidence, alluded to in the Sustainable Development Goals, to show that the ecosystem services derived from green infrastructure are fundamental for socio-economic development and general human wellbeing".

Green Adaptation, commonly referred to as “*Ecosystem-based Adaptation (EbA)*” in literature (Wicander, 2024, p. 10), encompasses the integration of green spaces and ecological principles into urban development to enhance resilience against climate change impacts while simultaneously enhancing nature (Derkzen et al., 2017). Thus, green adaptation strategies often involve *Nature-Based Solutions (NBS)*, which leverage the inherent properties of ecosystems to provide a range of ecosystem services, including climate regulation, water management, and biodiversity conservation (Lafortezza & Sanesi, 2019). NBS projects in the urban realm range from community roof gardens or urban food gardening pots to green school grounds, which not only improve residents’ living conditions by providing cooler temperatures and recreational benefits but can also be economically beneficial (e.g., cooling energy saved, diversification of livelihood opportunities). Thereby, green infrastructure has the potential to contribute to more resilient communities with the capacity to adapt to changing conditions (Lafortezza & Sanesi, 2019).

Current research emphasizes the importance of urban ecosystem services in sub-Saharan African cities in the face of climate change and the need to develop context-specific frameworks that take into account the historic development and unique characteristics of African cities (Lindley et al., 2018). Yet, compared to initiatives in the Global North, greening initiatives in African cities remain scarce and are not well-funded (Lindley et al., 2018).

Wolff et al. (2023) highlight the difference between NBS as adaptation in the Global North versus the Global South, particularly in informal settlements. Firstly, they need to be analyzed not only as mere adaptation projects but as social-technological systems that change community dynamics. Secondly, the types and usage of green adaptation projects differ. The authors found the most common types in informal settlements to be wetlands, green open spaces, community gardens, street trees, rehabilitation of riparian or waterfront vegetation, and infiltration devices. To be precise, community gardens were found to be most common and broadly beneficial for communities as they not only provide ecological benefits but also enhance food security as well as overall income levels. Green open spaces, on the other hand, were found to be more valued for their recreational value and support of local ecosystems (e.g., riverbank restoration). Overall, there is a gap in the literature on how informal

settlement residents perceive and conceptualize such initiatives, as well as how long-term maintenance can be ensured (Wolff et al., 2023).

In recent years, more work has been published on environmental justice with regard to green spaces in cities and the complex dynamic of green gentrification, linking back to maladaptation. *Green Gentrification* occurs when urban greening initiatives that are intended to benefit the local community or ecosystem lead to unintended consequences, such as displacement of low-income residents and the exacerbation of social inequalities (Shokry et al., 2022). The authors describe this as the *Green Resilience Paradox* (2022, p. 211):

Green resilience measures that are meant to reduce vulnerability to climate risks and impacts may do so for some even while exacerbating vulnerability to gentrification and displacement to areas at greater risk for other, socially vulnerable residents. (Shokry et al., 2022, p. 211)

This is especially true for highly segregated cities of the Global South. Empirical studies have found a correlation between demographic variables, such as income or race, and access to green urban infrastructure in various countries, including South Africa (Venter et al., 2020; Wolch et al., 2014; Wu & Kim, 2021). Using remote sensing data, Venter et al. (2020) found that higher-income areas across South Africa have greater access to green infrastructure, with tree cover increasing by 3.5% in private gardens and 2.7% in public spaces for every doubling of income. The authors further stress the direct correlation of income and race in this local context (Venter et al., 2020, p. 6-11): We find that the legacy of Apartheid and socio-economic segregation has entrenched and reinforced inequalities in access to green infrastructure over urban South Africa. [...] given the [...] income/race and green infrastructure outcomes (Figs. 7 and 8), it is not difficult to imagine how the unequal distribution of green infrastructure has remained unchanged in the last 25 years. The threats of climate change exacerbate this uneven dynamic, as green adaptation projects are being implemented in cities worldwide and may reveal existing vulnerabilities, even though the projects' primary motive is environmental justice (Wolch et al., 2014).

2.1.5 Capacity Building for Adaptation

It must be highlighted that adaptation is not solely about technological responses. Social processes, including capacity building and community participation, are critical for creating adaptation measures that are context-specific and socially accepted. Without local involvement, there is a higher risk of ineffective or inequitable outcomes (Markanday et al., 2019; Wolff et al., 2023). As with most adaptation projects, the long-term sustainability of green spaces can only be assured through ensuring the residents have the skills and knowledge necessary to maintain them. As Adger et al. (2005, p. 85) put it: “The degree of success critically depends on the capacity to adapt and the distribution of that capacity.”

Capacity building is the process of providing communities with knowledge, skills, and policy frameworks to cope with vulnerability and strengthen social resilience (Opitz Stapleton et al., 2017). The UNDP clusters capacity into the following factors: Political, Economic, Social, Cultural, and Environmental (Opitz Stapleton et al., 2017, p. 12). For instance, a person or household can be vulnerable on an environmental level due to poor infrastructure, which can lead to increased hazard exposure. Capacity can be built by restoring ecosystems such as coastal wetlands, which provide water filtering and protection from storm surges. On a social level, for example, strong networks and kinship can be seen as additional capacity to adapt, since strong communities have been shown to have better disaster preparation plans or to be better equipped financially thanks to strong family ties and social remittances (Opitz Stapleton et al., 2017).

From the start, the adaptation project shall define primary goals and key performance indicators that can be measured and assessed regularly within a monitoring and evaluation framework to ensure sustainability. In the case of green adaptation, capacity building often includes the transfer of skills and knowledge to ensure participation, self-sufficiency, and provide economic opportunities (Wicander, 2024). Nshimiyimana et al. (2023) describe this process as transferring a sense of shared ownership of responsibility for the space – becoming environmental stewards. Simultaneously, maladaptation by excluding especially marginalized

households or pushing them further towards city boundaries due to gentrification processes must be mitigated (Nshimiyimana et al., 2023).

2.2 Climate (Im)Mobilities

Migration, representing one facet of human (im)mobility research, is a phenomenon as old as humankind. Since the intensification of global warming, research on environmental and climate mobility has surged (Klaiber, 2014). However, data linking climate phenomena and human mobility remains scarce, and linking international migration with slow (e.g., flood) or gradual-onset (e.g., desertification) climate events poses a challenge (Opitz Stapleton et al., 2017). There is great difficulty in attributing migration decisions to a hazard specifically, not to the resulting political, economic, or social changes (Schriever, 2025). Data availability on internal climate-induced displacement has improved in recent years, mostly in the form of region-specific studies. It is evident that hazard-induced displacement is more prevalent where vulnerability is high and adaptive capacity is low (Opitz Stapleton et al., 2017). Schriever (2025), however, argues that vulnerability does not automatically prompt migration or displacement, as especially marginalized populations may be involuntarily immobile. The three major mobility outcomes —namely, migration, displacement, and immobility — following different climate change events can be seen in Figure 1.

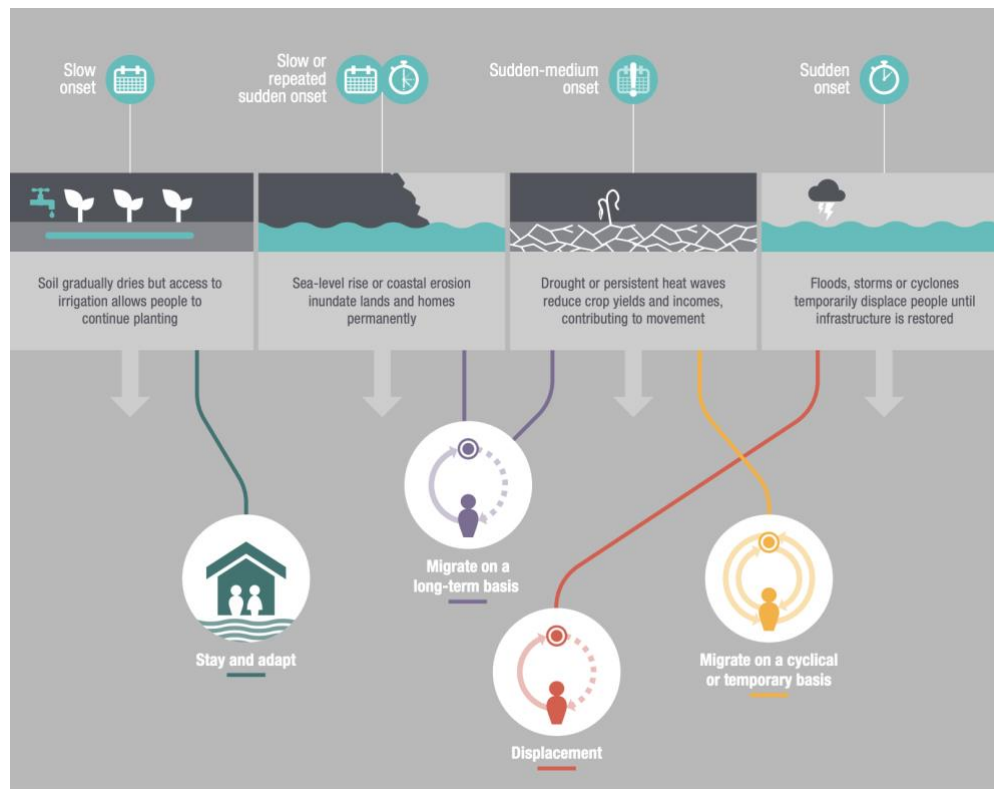


Figure 1. Climate Hazard Mobility Response Nexus. Source: Opitz Stapleton et al., 2017.

As of the 2010 UNFCCC Conference in Mexico, migration as adaptation is a strategy to address the effects of climate change and has entered global adaptation frameworks. While research in the early 2000s contributed to a narrative of climate refugees and highlighted securitization aspects, the recent framing as adaptation has led to research aimed at understanding migratory drivers in the face of climate change and informing policymakers (McLeman & Smit, 2006; Schriever, 2025). Schriever (2025, p. 1584) describes climate migration as an increasingly favorable solution: “Human mobility is thus interpreted as a strategy to reduce risks and vulnerability. [...] presented as a pragmatic, operationally oriented approach and seen as a policy ideal.” Nonetheless, migration has limitations as an adaptation strategy. Sakdapolrak et al. (2024, p. 90) define this limitation as follows: “the inability of migrants and their households to secure their livelihoods, well-being, and other valued objectives from intolerable risks through migration-related adaptive practices.” There are many factors,

including political regimes, sense of belonging, or a change in livelihood perspectives, that possibly restrict the adaptation success of migration (Sakdapolrak et al., 2024).

Immobility occurs when populations cannot or do not want to move away from areas facing environmental degradation or climate-related hazards, which reduces their livelihood options. In the case of immobility, voluntariness occurs on a spectrum, and yet it has to be acknowledged that voluntary migration decisions remain a privilege, according to Black et al. (2013, p. 36):

Without minimizing the significance of the 'right to stay' [...], it is also clear that ability to move is broadly correlated with wealth, level of capital (financial, human, social), the availability of places to move to, and fear of what would happen to property and assets left behind, so that broadly speaking, poorer people are generally less able to migrate even if they wish to do so.

There is a gap in literature on the drivers of immobility as well as in policy making, especially on facilitating in-situ adaptation without the risk of further trapping populations by ineffective adaptation measures (Black et al., 2013). For instance, in the case of Bangladesh, there have been frequent investments into cyclone shelters, which have, however, proven to be inaccessible to especially marginalized women in extreme situations (Black et al., 2013).

2.3 Place Attachment

To facilitate informed policy decisions and improve in-situ adaptation, it is crucial to understand why populations decide to remain in place. Drawing on behavioral migration theory and place utility, Adams (2016) suggests that individuals experience prolonged phases of dissatisfaction before deciding to migrate. One component of this decision-making process is *Place Attachment*, defined as the bond that people have with a place (Altman & Low, 1992), a sense of ownership or feeling of belonging, and cognitive attachment (Adams, 2016; Quinn et al., 2015). Consequently, place attachment drives decision making as well as risk behavior, including how communities adapt to climate change (Quinn et al., 2015).

In a study undertaken by Adams (2016), place attachment was a major reason for 23% of participants dissatisfied with their place of residence to opt for staying in-situ. In line with that, research by academics including Bustamante et al. (2023) and Blondin (2021) views place attachment as a major component of voluntary immobility in the face of environmental risk. It could be said that strong place attachment is an indicator for communities to adapt in-situ and care for their environments more intensely, withstanding even heavy adverse environmental effects. Stronger place attachment not only influences the likelihood to take adaptive action in a place but also the capacity to do so, for instance, by harnessing place-specific knowledge and localized social networks and ties (Manzo & Devine-Wright, 2013).

Examples from projects around the world show that there is an interconnectedness between adaptation response and attachment, worth examining. For instance, Süsser (2018) found that in a small village in North Frisia, Germany, renewable energy innovations and measures to drive change in the community enhanced the local place identity and, in turn, fostered positive engagement with climate change adaptation. Gurney et al. (2017) investigated the dynamics of residents' place attachment and participation in local environmental management along the Great Barrier Reef in Australia. While the results indicate that emotional ties with a place are not always strengthened by active environmental experience, the authors emphasize that community and strengthening a sense of place "provide important entry points for public participation" in such projects (Gurney et al., 2017, p. 10081).

On the other hand, sense of place and identity can be disrupted by the damaging impacts of climate change. Khanian et al. (2018), for instance, describe a weakening of place attachment due to frequent environmental destruction in a place of residence, ultimately leading to relocation and attachment to a new place. Adger et al. (2013) Demonstrate this with the example of a community facing very frequent flooding in Western Ireland. Some returning residents renovated their homes using inexpensive, second-hand materials, mentally preparing for the possibility of future flooding: "[...] previously valued and secure homes now felt transient, and previously enjoyed rivers now were viewed as dangerous." (Quinn et al., 2015, p. 165). Even though this behavior could be understood as a positive adaptation response, it illustrates how residents' ties to a place can be disrupted and how adaptation

could occur in a more just way. Similarly, involuntary mobility following natural hazards in the form of displacement or forced relocation programs impacts place attachment and identity on a general level, for instance, disrupting emotional ties that Indigenous communities have towards ancestral land (Quinn et al., 2015). There is a gap in the literature examining this complex socio-psychological interplay.

2.4 Integration of Concepts

Based on Adams' (2016, 2017, 2019) work, Blondin (2021) the study examined the dynamics between place attachment, adaptive capacity, and voluntary immobility at the example of vulnerable communities of Tajikistan's Pamir Mountains and found a mutually reinforcing relationship among the three components. Inspired by Blondin's (2021, p. 293) the conceptual model, this thesis explores similar dynamics, as shown in Figure 2, and additionally examines the Green Zone's capacity building potential in the regional context of Cape Town. The Green Zone project in Philippi, Cape Town, central to this thesis, serves as a concrete example of green climate adaptation, aiming to strengthen the adaptive capacity of surrounding communities in a socially and environmentally vulnerable Township in South Africa. On the one hand, the Green Zone may enhance place attachment, create active environmental experience and foster emotional and functional bonds between residents and their environment. This emotional tie plays a pivotal role in shaping local (im)mobility decisions, more specifically, whether individuals or communities decide to adapt in-situ in the face of climate change (voluntary immobility) or choose to migrate.

On the other hand, the project also contributes to capacity building across multiple domains - political, economic, social, cultural, and environmental - empowering bottom-up adaptation. This can include strengthening local knowledge, skills sharing, and livelihood diversification, enhancing social networks, and fostering a sense of ownership of these natural spaces.

Together, place attachment and building adaptive capacity converge in shaping (im)mobility responses to stressors of climate and global change. The suggested dynamic thus highlights the Green Zone's potential to act as more than an environmental intervention: It may reduce

residents' vulnerability and empower voluntary (im)mobility decisions, whether they may be migrating or staying, without disrupting place attachment.

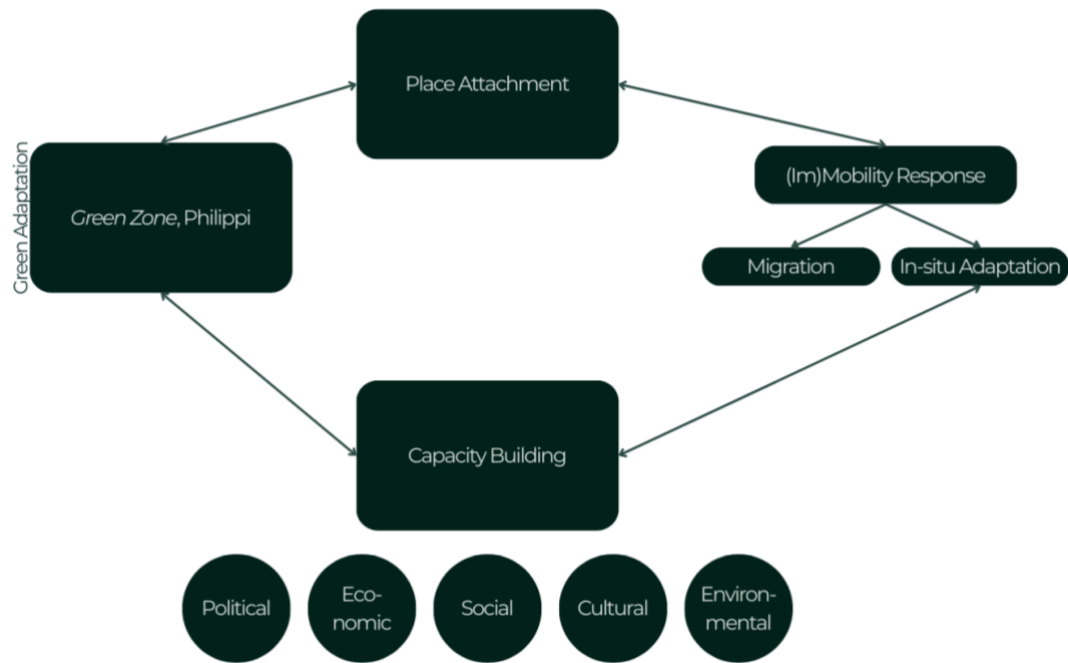


Figure 2. The complex interplay of capacity, place attachment and (im)mobility. Data collected and figure created by the author (2025).

3 Geographical Background

This chapter provides the geographical background, situating the Philippi township within South Africa's historical and contemporary development dynamics and providing insights into national adaptation efforts.

3.1 Urban Development in South Africa

Africa is expected to experience the highest rates of urbanization until 2030, with South Africa showing the 10th highest urbanization rate, 69% to be precise, in 2023 (Statista, 2023). In South Africa, vastly uneven urban development patterns, rooted in colonialism and reinforced during the Apartheid era, have produced townships and informal settlements with shortcomings in basic service delivery and public infrastructure (Peirson & Ziervogel, 2021). While legislated segregation came to an end in 1994, racial division is firmly rooted in space nowadays (Gauld, 2015). To understand the spatial inequalities in South Africa, one must dive deeper into the country's historic urban development.

In 1652, the Dutch East India Company established a strategic station where the City of Cape Town is still situated today to provide ships from Europe with resources during the colonial era. A European agricultural colony established itself at the Cape, increasingly migrating north and eastwards until 1830, breaking Indigenous land rights further. Reserves were founded in rural areas for Indigenous People, namely the Khoisan and the Bantu population, to live under the supervision of colonial forces (Christopher, 1994). A.J. Christopher, author of *Atlas of Apartheid*, stresses that in the late 19th and early 20th century, racial taxonomy already played a determining role: "In any discussion of population in South Africa, the racial connotation is of paramount importance, as membership of a particular racial or ethnic group has largely defined the individual's opportunities and rights." (Christopher, 1994, p. 18). Apart from White, Black, and Asian populations, primarily Indian migrants, the taxonomic category *Colored* was established. Especially in the Western Cape, the Colored Community was comprised of "the people of mixed European ancestry, who were socially excluded from being

accepted as European” (Christopher, 1994, p. 22), as well as descendants of enslaved people brought to the colonies in the 17th and 18th centuries and descendants of the Khoisan People. By the mid-20th century, White people were a minority in South Africa, with Afrikaans speakers dominating the rural areas and English speakers dominating the city population, while Black and Colored communities were systematically pushed towards the urban periphery (Christopher, 1997). According to Christopher (1994), the formal urban segregation started in 1834 when the Colonial government imposed racial restrictions on certain areas. Even in the pre-Apartheid era, legal structures such as the Natives Urban Areas Act (1923) and the Slums Act (1934) formed racially segregated spaces throughout South African cities, with suburbs being separated by wide access roads (Christopher, 1997).

From the onset of the Apartheid regime in 1948, this persistent trend of spatial division was legally enforced by the Group Areas Act (1950), under which each taxonomic racial group was assigned a certain geographical area and prohibited from entering others (Rule, 1989). In addition, the government established ten ethnically distinct homelands (*Bantustans*) for different tribes of Black People. Around 3.5 million Black South Africans were removed from cities and relocated to these infrastructurally poor resettlement sites. However, the growing demand for cheap labor in metropolises such as Cape Town led to the creation of separate urban settlements for Black, Colored, and Asian labor migrants (Abel, 2019; Christopher, 1994). Abel (2019) describes a constant political tension between a need for labor power to facilitate industrialization and White People, still only making up 20% of the entire population, dreading political mobilization of Black urban workers (Abel, 2019). The result was a political system of racial segregation and simultaneous inefficiency, with post-Apartheid effects being persistent until today (Abel, 2019; Christopher, 1994).

In the geographical context of Cape Town, the Cape Flats, an area situated Southeast of central Cape Town, became a designated area for the forced relocation of Black and Colored communities under the Group Areas Act. Its historically developed townships persist to this day and serve as markers of socio-economic and environmental vulnerability (Christopher, 1994; Greenpop, 2024; Nhamo et al., 2021). Cape Town has continuously expanded and diversified its economic sectors, becoming an important center for manufacturing,

administration, culture, and service. This growth has attracted rural residents in search of jobs, who tend to settle in townships (Wilkinson, 2000). While formal buildings exist, remote sensing data indicate that informal settlements have expanded over the past 20 years, with key areas being the townships of Monwabisi Park, Enkanini, Klipfontein Glebe, and Philippi (Cinnamon & Noth, 2023). Settlement growth was further accelerated during socio-political turbulences of the Covid-19 crisis and forced relocations to temporary sites, undermining community stability (Cinnamon & Noth, 2023).

3.2 Philippi, Cape Town

In South Africa, climate-related hazards such as water shortages, wildfires, and floods are disproportionately impacting residents of informal settlements, emphasizing the need for just, urban climate adaptation (Chersich et al., 2018). Philippi is one of Cape Town's largest townships, with a population of 191,025 at the last census in 2011, 94% of whom identify themselves as Black African (City of Cape Town, 2023). The Group Areas Act of the Apartheid regime has left Capetonians in a situation of deeply rooted racial segregation, visible, inter alia, in housing and infrastructure. In fact, in 2022, 22% of Cape Town's Black African residents lived in informal settlements, compared to less than 1% of the formally White population (City of Cape Town, 2023). In Philippi, more than half of the community faces informal housing situations (City of Cape Town, 2013). While more formal sections of Philippi have schools and community facilities, municipal service delivery is inadequate, and infrastructure is deteriorating. Rapid population growth has intensified the shortage of social amenities. Infrastructure disparities are evident, with formal areas having essential underground services, while informal settlements lack basic provisions such as light poles (Leigh, 2023). Many residents do not have sufficient access to clean sanitation infrastructure. For instance, in 2021, only 74% had access to flush toilets (Peirson & Ziervogel, 2021). Another public health issue is emissions from heavy traffic on nearby highways, which form a layer of “brown haze” under cooler temperatures (Wilkinson, 2000, p. 198). The issues mentioned above are

compounded by the fact that residents often feel detached from their local environment and have limited capacity for sustainable, community-led development (Greenpop, 2024).

Cape Town's former townships are characterized by significant socio-economic and environmental challenges, including poverty, unemployment, high crime rates, and hazard vulnerability (Badenhorst, 2025; Ncube et al., 2023; Rule, 1989). These issues are compounded by the fact that residents often feel detached from their local environment and have limited capacity for sustainable, community-led development (Greenpop, 2024).

Due to both the socio-economic profile and the physical characteristics of the area, Philippi residents are vulnerable to climate-associated risks. Cape Town is located at a latitude of 34° and experiences a Mediterranean climate, typically with warm, dry summers and cool, wet winters (Wilkinson, 2000). Table Mountain separates the city into different areas and creates microclimates due to its physical characteristics. The Cape Flats, including Philippi, are situated approximately 45 km East of Table Mountain in an especially low-lying area that is dominated by marine sand and what used to be dune fields. Its proximity to the aquifer renders the Cape Flats vulnerable to persistent winter flooding, as the soil drains slowly due to its characteristics (Greenpop, 2024; Wilkinson, 2000). Simultaneously, droughts put strain on already scarce water supplies.

South Africa has experienced unusually long phases of drought since the 1980s, with strict water saving regimes being implemented in recent years (Von Maltitz et al., 2024). The densely populated informal settlements adjacent to the city are prone to fires during dry summers, underscoring the communities' need for holistic interventions that bolster both human resilience and environmental sustainability (Von Maltitz et al., 2024). Seasonal flooding and waterlogging have hindered vital agricultural projects aimed at improving food security, while also revealing water contamination and high levels of nitrogen levels (Badenhorst, 2025). Ecologically, Cape Town and its surroundings in the Western Cape constitute one of the Earth's six floral kingdoms, the *Fynbos* biome to be precise (Wilkinson, 2000). Moreover, Philippi is home to the *Cape Flats Dune Strandveld* vegetation type, which thrives in sandy soil (Greenpop, 2024). In recent years, invasive species such as acacia, oak, and stone pine have

destabilized the ecosystem and made it more susceptible to threats like wildfires. (Wilkinson, 2000; Greenpop 2024). By integrating ecological restoration with community needs, ecosystem-based adaptation efforts show a high potential in this area to improve residents' living conditions and mitigate environmental hazards. Another central aspect is to build biodiversity corridors for the Cape Flats Dune Strandveld ecosystem, which is threatened by rapid urbanization (Badenhorst, 2025; Greenpop, 2024).

Greening serves as a visual indicator of economic and racial inequality throughout the city of Cape Town. Well-resourced neighborhoods exhibit a significantly higher proportion of clean, green, and safe public spaces in comparison to under-resourced neighborhoods (Wolch et al., 2014). In the face of climate change and rapid urbanization on the African continent, green spaces play a crucial role as an adaptation measure (Venter et al., 2020). However, not only do they provide local functions, but they may also be an influencing factor on a behavioral and attitudinal level when it comes to adaptation decisions of populations affected by environmental change. State-of-the-art research on urban development states that natural spaces must be incorporated in the urban landscape to support livelihoods in socio-economically challenged areas. Venter et al. (2020, p. 11) emphasize:

[...] there is sufficient evidence, alluded to in the Sustainable Development Goals, to show that the ecosystem services derived from green infrastructure are fundamental for socio-economic development and general human wellbeing.

A previous study on the impact of urban greening conducted in Khayelitsha, a township in the Cape Flats with a similar socioeconomic profile to Philippi, found that urban forestry had the potential to redistribute the environmental, economic, and psychosocial benefits of tree cover to poor communities (Gauld, 2015). The synthesis further indicated that participation in planting trees can promote justice through community empowerment, skills development, education, and purposeful bridging of racial gaps.

3.3 National Adaptation Plan

Establishing community resilience in rapidly urbanizing contexts is a core priority of the global political agenda, anchored for instance in the UN 2030 Agenda and the Sustainable Development Goals (UN DESA, 2015). In response, many countries, including South Africa, have developed National Development Plans (NDPs) and National Adaptation Plans (NAPs) to translate global commitments into locally relevant action (UNDP, 2024). South Africa's NDP emphasizes that a just climate transition must "ensure that land reform and development programs emphasize climate adaptation and innovation" (National Planning Commission, n.d., p. 39). With the 2024 Climate Change Bill, a complementary legal framework was created to fulfill the commitments set out in the Paris Agreement in 2016 (UNDP, 2024). It emphasizes emissions reduction, climate adaptation, and a just transition towards a decarbonized economy and entails obligations for provinces and municipalities to integrate climate responses (Badenhorst, 2025). The local NAP concretizes the country's adaptation efforts and shall provide coherence and coordination amongst stakeholders such as public institutions and non-profit initiatives. To reduce social vulnerability and build adaptive capacity, Chapter 4.2 suggests a cluster approach, focusing on (Department of Forestry, Fisheries and the Environment, 2020, p. 26):

A: Increased human resilience and adaptive capacity.

B: Increased economic resilience and adaptive capacity.

C: Increased environment and ecological infrastructure resilience and adaptive capacity.

D: Increased physical infrastructure resilience and adaptive capacity.

National plans are being enforced across sectors and made concrete by the City of Cape Town's *Integrated Development Plan (IDP) 2022-2027*, *Climate Change Strategy (2021)*, and *Resilience Strategy* prioritizing climate resilience, equitable development, and ecosystem protection, with goals to reduce carbon emissions, adapt to climate hazards, and enhance social resilience. Due to climate uncertainty and prolonged periods of water shortages in

recent years, the *Cape Town Water Strategy* puts additional foci on water security and drought resilience (City of Cape Town, 2019). Against this backdrop, the Green Zone project aligns with national and municipal adaptation priorities by simultaneously addressing ecological restoration, social resilience, and economic development.

Despite political agenda-setting, finance constitutes a significant barrier to adaptation in Southern Africa, according to data. While public and private climate finance volumes are increasing globally, estimates show that the majority of funds are directed towards mitigation rather than adaptation efforts, resulting in a rapid increase in adaptation costs (Mbiyozo, 2021; Climate Policy Initiative, 2025). In 2021, South Africa received the highest amount of climate funding through international sources (612.6 USD), out of which only 2% was dedicated to adaptation funding (13.6 USD) (Mbiyozo, 2021, p. 5). While this uneven spread can partly be attributed to a lack of data available on adaptation compared to mitigation finance, a data gap is also persistent in adaptation project monitoring and evaluation, globally inhibiting this pathway (Climate Policy Initiative, 2025). More robust estimates of the cost-benefit ratio and qualitative insights into success factors of adaptation projects are required in South Africa to attract international investors, especially over the next decade, to avoid higher economic damages caused by climate change impacts in the future (Mbiyozo, 2021).

4 Methodology

This chapter outlines the methodological approach of this study. First, it situates the research within its geographical and social context by describing the case study: Green Zone project and the study site Philippi Village. Then, it details the research design, including stakeholder mapping, sampling strategy, and data collection. Finally, it discusses the analytical framework employed as well as reflexivity and positionality.

4.1 Research Site: *Green Zone*, Philippi, Cape Town

4.1.1 *Greenpop and the Living Landscapes Initiative*

The Philippi *Green Zone* (referred to as the *project*) is part of the *Living Landscapes* initiative led by the Cape Town-based non-profit organization *The Greenpop Foundation* (referred to as *Greenpop*). The site, geographically located in Philippi East, was selected as a case study upon recommendation by Greenpop's Urban Greening Executives. This was due to its cooperation with the local entrepreneurial hub *Philippi Village* and its potential for effective capacity development. The surrounding area is marked by socio-economic marginalization and environmental vulnerability, as described in previous chapters.

Greenpop is a South African-founded and led NPO. In 2010, the organization's first project aimed to plant 1,000 trees in one month at under-greened schools in Cape Town. Since then, Greenpop's urban greening efforts have expanded across South Africa and Zambia, evolving from tree planting to include Indigenous gardens and food gardening projects (Greenpop, 2024). *Living Landscapes* aims to create green community spaces that meet the specific needs of vulnerable communities in South African cities. By collaborating with local community organizations and stakeholders, the project designs and installs green spaces that include biodiversity gardens, infrastructure, lawns, benches, pathways, food gardens, shade structures, community nurseries, and trees (Greenpop, 2024). On a national scale, *Living Landscapes* was established in September 2023. As of 2025, Philippi is one of three urban

greening sites established within *Living Landscapes*, the other two being situated in Lavender Hill, Cape Town, and Eldorado Park, Johannesburg (Badenhorst, 2025).

4.1.2 *Philippi Village*

The project's partnering organization, *Philippi Village*, is a mixed-use development on the grounds of a former cement factory, funded by the *Bertha Foundation* and locally managed. It acts as a "business catalyst for township communities situated in Cape Town's Cape Flats area" (Philippi Village, 2022), providing infrastructure and workspace for micro businesses, upskilling opportunities, as well as a safe space for community engagement. Current tenants of the 54 container-style office spaces include a record and video production studio, a café, a community kitchen, and a kindergarten. The twelve-hectare plot of land behind the buildings shall be transformed into a green, community-centered space (Philippi Village, 2022). The Philippi Village office buildings are located on site, as displayed in Figure 4. In addition to fostering entrepreneurship and providing infrastructural services, Philippi Village serves as a platform for civic engagement and local capacity building, which is why this greening site mainly displays potential for community-led adaptation.

After Living Landscape's inception in 2023, the Philippi site was launched in March 2024, with construction and planting kicked off in the first half of the year (Badenhorst, 2025). Since then, vast areas of land have been cleared, and beds have been established around the Thembi sculptures and playgrounds (see figure 5). Figure 4 displays the various elements of the Green Zone as of the proposal in 2024, including culturally significant elements (e.g., Thembi statues), recreational facilities (e.g., running track), as well as green adaptation efforts (e.g., wetland biofiltration system, biodiversity garden, agricultural areas).

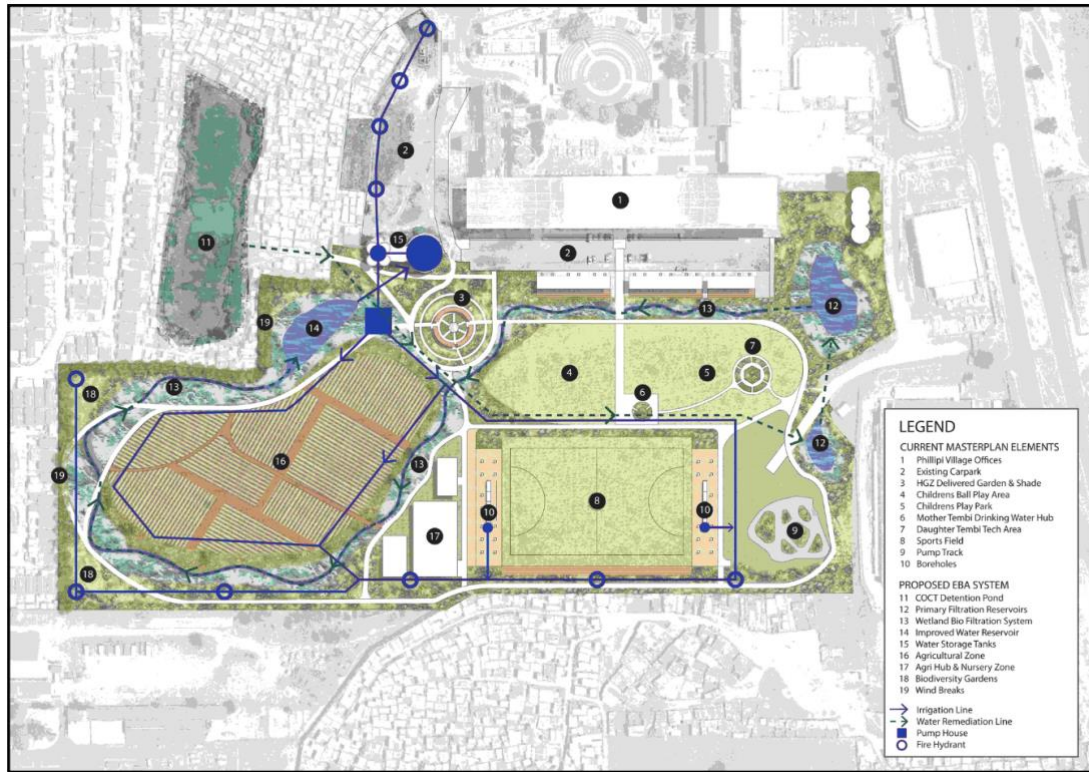


Figure 3. Landscape Plan for the Green Zone in Philippi. Source: Badenhorst, 2025.



Figure 4. Green Zone progression in Philippi Village back land between February and July 2025. Collage created by the author (2025), using photographs by the author and by Imraan Samuels, courtesy of Greenpop.

4.1.3 Project Aims and System Design

Greenpop's urban greening projects are based on the *Theory of Change* (UNSDG, 2016; Greenpop, 2024), applying an iterative approach linking specific activities with intermediate and long-term outcomes. The organization focuses on tangible actions such as planting Indigenous plants, installing garden infrastructure (e.g., benches), as well as maintenance infrastructure (e.g., sustainable irrigation systems), and hosting engaging gardening events for community members and other stakeholders such as donors. These efforts are complemented by educational interventions and skills development for selected caretakers (Greenpop, 2024; Samuels, 2025). The short-term impact focuses on increasing the functional green space in under-greened communities and building local awareness of environmental matters and the skills needed to empower the community through the projects. Capacity building is especially emphasized through training programs that ensure long-term sustainability. At the Philippi site, the aim is to train and employ up to 20 garden groundskeepers (Samuels, 2025). The long-term impacts (12+ months) reflect both ecological and social ambitions: improved ecosystem services (e.g., wildlife habitat, biodiversity corridors, urban heat mitigation), increased environmental stewardship, and the self-sufficient space maintenance by community caretakers (Greenpop, 2024). In the case of the Philippi Green Zone, a concise monitoring and evaluation framework tracks these goals and corresponding indicators by employing quarterly reviews of the monitoring data, periodical community surveys, and ecological impact assessments (Samuels, 2025).

A context-specific challenge to be addressed in Philippi is the area's susceptibility to flooding (Badenhorst, 2025; Samuels, 2025). The general flood risk of the Cape Flats is exacerbated by the local water detention basin, owned and operated by the City of Cape Town. As displayed in Figure 3, the basin is adjacent to the Philippi Village grounds as well as a large-scale informal settlement (*Waterfront Settlement*) (Badenhorst, 2025). According to the Philippi Village General Manager, the pond has shown blockage for multiple years, impeding proper drainage during rainfall periods—even small amounts of rain cause water to overflow into the closely spaced shacks and narrow streets. A water quality analysis commissioned by *Philippi Village* has shown high levels of pollution (S. Nikani, personal communication, July 17, 2025). Both

economic losses and a reduction in quality of life are evident in Philippi, along with a serious public health concern, which adds additional strain to the local public health system that is already at capacity (Badenhorst, 2025). Similar cases of flood events and contaminated water, due to inaccessible or malfunctioning public property, along with public health concerns such as skin diseases and diarrhea, have been reported in other townships of the Cape Flats (Ncube et al., 2023). As evident in Figure 3, the Philippi Village backland displays wetland characteristics and is prone to high water levels, posing problems for greening during high-precipitation periods (Badenhorst, 2025). Thus, the creation of holistic adaptation projects is crucial.



Figure 5. Flood-prone detention pond and effected informal settlements (indicated in red) in Philippi East (indicated in red). Source: Badenhorst, 2025.

To address the issue, Greenpop proposed an ecosystem-based adaptation (EbA) approach targeting wetlands. According to the project proposal, the site is designed to manage water sustainably and support soil regeneration while enhancing the system's resilience to climate

impacts such as flooding (Badenhorst, 2025). The site design features a stepped cross-sectional design along the wetland corridor to allow for natural water level fluctuations. This design enables the wetland to retain water during dry periods and to act as a buffer during periods of heavy rainfall, thereby mitigating flood risks. Soil excavated during the creation of the wetland basin will be repurposed to elevate adjacent zones, particularly the southern agricultural area, thereby protecting them from inundation.

Additionally, the organic matter generated through wetland maintenance will be reintegrated into the soil of these adjacent farming areas, enhancing fertility, increasing carbon content, and improving the soil's water-holding capacity. This approach reduces the dependency on external water sources, such as municipal or borehole systems. Once the wetland is complete, the elevated agricultural areas serve a dual function as a secondary flood buffer, enabling water to be distributed and absorbed slowly through a strategically designed irrigation and infiltration network (Badenhorst, 2025).

4.2 Study Design

4.2.1 Research Approach

The guiding question of this research is: *Why do communities persist despite adverse environmental conditions, and how can we aid that, build capacity for community-led climate adaptation, and make them thrive?* Specifically, this question is addressed by assessing the dynamics and impact of the Philippi Green Zone, focusing on place attachment, (im)mobility dynamics, and capacity building (see figure 2). The study employs a qualitative research design with an exploratory approach to investigate the socio-psychological dimensions of lived experiences with urban greening in Philippi. The study design builds on established methodology in case study-based vulnerability and (im)mobility research (Adams, 2016; Bogner et al., 2018; Refai et al., 2024; Van Praag, 2021). As Bogner et al. (2018) describe, exploratory interviews can never provide systematic or replicable information but generate hypotheses and provide an entry point for research with other methods. In this study, specifically, interviews were aimed at collecting data about lived experiences with the project,

“process knowledge” and “interpretative knowledge” (Bogner et al., 2018, p. 657). Thus, the base of this research is fieldwork in Philippi, Cape Town, in July 2025.

A stakeholder mapping was conducted at the onset of the research to ensure a comprehensive understanding of the project’s role in the local context (see figure 6). This mapping serves both a conceptual and a practical purpose. Conceptually, it illustrates the diverse actor landscape shaping capacity building and adaptation processes in Philippi. Practically, it informed the purposive sampling strategy, ensuring the selection of participants that covered many angles of the project. Descriptions of respondents’ affiliations with the project are thus provided in Table 1. As is evident from Figure 6, the project’s stakeholders were broadly clustered into four groups, namely residents, partners, local representatives, and public organizations. While public organizations (e.g., City of Cape Town) were recognized, they were excluded from the primary analysis for two reasons. Firstly, the scope of this thesis focused on community-level adaptation dynamics rather than top-down processes. Secondly, practical limitations constrained access to representatives of public institutions within the available timeframe of fieldwork. While public organizations remain a contextual factor in the stakeholder landscape, the analysis centers on the role of non-governmental organizations and community actors, reflecting the bottom-up orientation of the Green Zone.



Figure 6. Stakeholder Mapping. Data collected and figure created by the author (2025).

4.2.2 Data Collection

A total of 15 semi-structured interviews with key stakeholders (five per stakeholder group) were conducted in Philippi, each lasting between 25 and 55 minutes. The three pre-defined stakeholder groups are intended to cover the most crucial angles needed to address the research question:

1) Project Partners (n= 5):

Includes representatives directly involved in the design, implementation, and/or management of the Green Zone with expert knowledge of the project and geographical context.

2) Local Representatives (n= 5):

Consists of individuals with a formal or informal leadership role in the community, such as community aid workers, teachers, business owners, health workers, or community champions, offering insights into broader local issues or impacts.

3) Residents (n= 5):

Includes community members in Philippi who regularly use or live near the Green Zone with interviews focusing on their lived experiences, everyday life, and stressors.

The interviews were conducted in July 2025 in person on the grounds of Philippi Village, except for two executive interviews, which had to be performed via Google Meet on July 23 and 29 due to logistical constraints. The interviews were held and transcribed in English. All respondents were informed about the aim of the interviews and assured that their data were anonymized through signing an informed consent form (available upon request). In-person interviews are especially crucial in contexts where trust needs to be built, as they enable interpersonal expression, context sensitivity, and full accommodation of the interview subject (Brinkmann, 2018). The only personal data recorded included their name (sometimes used as pseudonyms) and role within the project. Demographic variables were not deemed to be a decisive factor and thus excluded. Discussions in migration studies surrounding anonymization have contributed to a state-of-the-art procedure of pseudonyms being consistent with participants' ethnicity to avoid bias (Wang et al., 2024). Participant details can be found in Table 1.

No.	Pseudonym	Date	Interview Setting	Stakeholder Group	Role
1	Jongiwe	10/07/25	Community Kitchen	Local Representative	Lead Community Kitchen Philippi Village
2	Kumkani	10/07/25	Blackflip Studio	Local Representative	Executive Record Studio <i>Blackflip Studios</i> , Philippi
3	Amyoli	10/07/25	Phunga Cafe	Resident	Barista <i>Phunga Café</i> , Philippi
4	Abongile	11/07/25	Philippi Village Offices	Project Partner	Greening Executive, Philippi Village
5	Layla	14/07/25	Philippi Village Offices	Project Partner	Managerial Executive, Philippi Village
6	Thato	14/07/25	Philippi Village Offices	Local Representative	Community Engagement and Security between Philippi community and Philippi Village
7	Gugulethu	16/07/25	Philippi Village Offices	Project Partner	Managerial Executive, Philippi Village

8	Mbulelo	17/07/25	Philippi Village Offices	Local Representative	Leader of a grassroots community aid organization, Philippi
9	Sibabalwe	17/07/25	Philippi Village Offices	Resident	Resident and Green Zone caretaker
10	Sarah	23/07/25	Online	Project Partner	Strategy Executive, Greenpop
11	Fanizwa	24/07/25	Philippi Village Offices	Local Representative	Managerial Executive at Legal Center, Philippi
12	Fazile	24/07/25	Philippi Village Offices	Local Representative	Paralegal at Legal Center, Philippi
13	Dumisa	24/07/25	Philippi Village Offices	Resident	Neighboring resident
14	Edgar	24/07/25	Philippi Village Offices	Local Representative	Community Engagement Manager, Philippi Village
15	Jani	29/07	Online	Project Partner	Urban Greening Manager, Greenpop

Table 1. Respondent List

The key stakeholders participating in this study may be referred to as experts, since they have “power in a particular social context by applying special knowledge” (Bogner et al., 2018, p. 655 f.), a term that does not necessarily refer to economic or political terms but power to influence people’s realities. In this context, people with intense lived experience with the Green Zone possess specific knowledge and experience that is not accessible to the broader public, whether through being a gardening volunteer or project executive.

Semi-structured, in-depth interviews were found to be best-suited in this study as they allow the interviewee to add information deemed necessary, thus deepening or introducing new themes, and for the interviewer to act as a “knowledge-producing participant” (Brinkmann, 2018, p. 991). In-person interviews are especially crucial in contexts where trust needs to be built, as they enable interpersonal expression, context sensitivity, and full accommodation of the interview subject (Brinkmann, 2018). Factors such as the Philippi community members facing limited infrastructure and frequent power outages, along with the sampling procedure requiring physical proximity and relational trust, did not allow for remote data collection.

The interview guide is grounded in the key research themes established at the start, as well as a priori literature research (see Appendix 2). The three blocks contain varying questions for each stakeholder group.

4.2.3 Sampling Strategy

To select participants, a combination of purposive and snowball sampling was applied in collaboration with Greenpop and Philippi Village. Prior to the fieldwork, both organizations agreed to provide initial access to the field and help to identify potential interviewees from the three stakeholder groups: project partners, local representatives, and community residents. While some key individuals, such as Greenpop executives and the Philippi Village CEO, were deliberately selected for their central roles in the project, most participants were recruited through on-site informal referral processes. The researcher spent a considerable amount of time at the Philippi Village premises, engaging with staff and community members, following an almost ethnographic approach to narrative data (Murray, 2018). Based on daily interactions and gatekeepers' suggestions, additional participants were approached on site, including those identified by their involvement in or proximity to the Green Zone.

In some cases, the researcher suggested thematic angles (e.g., voices from the community engagement executives or business owners), which the local facilitators then helped coordinate. While this approach enabled access to a broad range of perspectives, it also introduced limitations. One must acknowledge that due to language barriers and safety precautions, participants were solely recruited at the grounds of Philippi Village and not within the broader settlements of Philippi East. Moreover, entry points and contacts were established by project executives. Thus, it was hardly feasible to recruit residents who were not regular visitors to the space. Consequently, the sample may be biased towards individuals who are already engaged with or inclined to support the project, a fact that must be critically reflected upon during the analysis.

4.2.4 Data analysis

In ensuring a systematic and comprehensible analytical process, this study follows a Qualitative Content Analysis (QCA), pioneered by Mayring (2014, 2022). QCA is used to describe the meaning of qualitative data systematically by reducing the data and employing a coding system with multiple categories (Mayring, 2022; Schreier, 2014). More specifically, the method aims at identifying patterns in the data as well as building assumptions, correlations or differences across contextual settings and revealing communication biases (Schreier, 2014).

This approach, praised for its potential to ensure rigorous qualitative research, follows specific steps that will be described below. Upon analysis, the audio recordings were transcribed manually and using the MaxQDA transcription software. In line with the framework suggested by (Mayring, 2022; Schreier, 2014), the process begins with an initial reading of the material and breaking down the material into sections.

Subsequently, the coding frame was built (see Appendix 3). Coding for QCA can be approached deductively, inductively, or with a mixed approach. The present study relies on a *Grounded Theory* approach, which entails building hypotheses through the interviewees' responses and coding them to reveal systematic patterns and differences. In discovering Grounded Theory as a methodological approach Strauss & Corbin (1967) postulated that knowledge can be created from data inductively. In explorative research, especially, Grounded Theory leaves more room for constructing meaning and adding concepts through the participants' eyes, compared to quantitative analysis or deductive coding with rigid categories (Strauss & Corbin, 1967; Schreier, 2022). Therefore, a coding frame was built in multiple rounds, establishing unidimensional main categories, such as *capacity building*, and multiple, mutually exclusive subcategories, such as *upskilling*, *recreation*, or *flood relief*. The main categories were primarily concept-driven, relying on themes emerging from the theoretical background and research question, while the subcategories were solely data-driven. In the next step, two rounds of trial coding were conducted with the established coding frame. The researcher refined the category definitions and removed any that appeared to be redundant, following

the principles of consistency and validity (Schreier, 2022). In line with state-of-the-art QCA, the coding frame must not be changed after iterative trial coding (Schreier, 2022).

Finally, the researcher conducted the main coding using the qualitative analysis software MaxQDA. Thereby, categories were assigned to all units (paragraphs and sentences), and the material was reduced to identify patterns and relationships in the data. Crucial passages were marked, and quotations from each first-level coding were reviewed to develop connections, which allowed conclusions to be drawn.

4.2.5 Ethical and Security Considerations

Ensuring ethical and safe research is of the highest priority when working with vulnerable participants in developing settings such as the Cape Flats. Informed consent was given by all interviewees after the purpose, potential benefits, and publication were explained to them verbally and handed out in written form. At any time did they have the right to withdraw from the study or strike answers from the record. Special attention was given to vulnerable groups and sensitive topics by obtaining guidance from participants through the teams of Greenpop and Philippi Village. A culturally sensitive and safe setting was ensured by accompanying the Greenpop team during site visits and conducting the interviews on the Philippi Village grounds with security surveillance.

Regarding data security, sensitive information was stored on an external device, and file names were anonymized to prevent identification. By employing encryption protocols, data security was ensured during the transmission process.

4.2.6 Positionality and Reflexivity

The research interest in this topic emerged from a previous internship with Greenpop in 2022, first-hand experience of the complexity of development issues compounded by climate change in Cape Town townships. Despite two extended stays and cultural experience in South Africa, the researcher acknowledges her inherent ethical bias. While previous involvement in

the organization's projects have provided contextual knowledge and have shaped this research topic, a neutral and reflective stance on the subject was kept in result analysis and interpretation. Further, factors that may have influenced the relationship between researcher and respondent must be acknowledged. Firstly, conducting research in a Black township as a white, educated, non-local researcher holds potential for power asymmetries with participants. Secondly, sampling involving the help of Greenpop and Philippi Village may have created an assumed connection between the researcher and the project executives. Subsequently, interviewees may have withheld criticism or been euphemistic regarding project impacts. To mitigate bias, the researcher clarified her aim and neutral stance to interviewees before every interview. On a more general basis, a significant amount of time was spent on site to build trust with stakeholders through informal contact, humility, and volunteering within the project. Lastly, even though this author has had frequent interactions with Greenpop's projects and has a firm interest in urban greening, reflexivity and guidance by literature were a continuous part of this research process.

5 Results

"[...] when I'm looking at these green spaces, I think of them largely as places of kind of dignity and belonging, because historically townships are neglected spaces. They're spaces that are, I'm not saying dirty, but that are not cared for, often not looked after, poorly planned. And then I think when people see themselves in beautiful spaces, I hope it shifts something else and how they think about not just their spaces, but themselves as well. I think it's a powerful affirmation of kind of human dignity" (Layla, executive at Philippi Village).

The following chapter presents the results of the interview data, contributing to the question of why communities persist despite challenging environmental conditions, how green adaptation projects build capacity, and what the (im)mobility responses are in this case study. The results are structured thematically, showing the emergent themes and patterns.

5.1 Components of Vulnerability in Philippi

For successful adaptation interventions, it is imperative to identify and address context-specific vulnerability components (Rouzaneh & Savari, 2024). The emergent layers of vulnerabilities are consistent with the preceding discussion in Chapter 3.2. However, the interviewees placed particular emphasis on the pressures of flooding and violence in Philippi. In general terms, factors that render Philippi residents particularly susceptible to external stressors can be categorized and summarized as follows.

5.1.1 Social Pressures

In this case study, the most frequently cited livelihood pressures were those stemming from violence. Residents and local representatives have reported regular occurrences of criminal events and expressed fear related to these incidents. While petty crime appears to be a regular part of life in Philippi, organized crime hinders economic development and exacerbates poverty. The issue of gangs and criminal syndicates recruiting young boys from the streets,

causing communities to become "so violent and volatile" (Kumkani, local representative), was frequently discussed. The presence of violent gangs in Philippi has been shown to hinder the establishment of a safe environment, as well as the generation of business opportunities and public participation. This is due to high rates of car hijackings and gun violence. It is essential to acknowledge the challenges endured by individuals living in areas like Philippi, where the lack of public transportation and car-sharing services necessitates law enforcement escorting partners to meetings. Businesses reportedly pay extortion fees demanded by gangs and crime syndicates to operate safely. Furthermore, executives of the local legal center report frequent occurrences of domestic violence rooted in drug and alcohol abuse.

Kumkani, a local record studio executive, illustrates how violence exacerbates the already precarious living conditions:

It's just not safe for anyone. You have no water. You don't have a place to relieve yourself. [...] So imagine you, you live and there's no street lights. It's 9 p.m.. You have a child that's probably having tummy issues. You literally have to leave your home at 9 p.m. in darkness. Take your child to use the toilet and they still uses a bucket system. Hopefully walk back safely with them (Kumkani, local representative).

Another social stressor is the prevalence of informal settlements. During the interviews, respondents cited two main reasons for this phenomenon. First, they described the historic legacy of apartheid separation, and second, they identified the challenging housing market as a contributing factor. One interviewee offers the following description:

There's not enough space for people to get housed. [...] People here are getting further and further pushed outside of the city centre. All the vacant land in the city is being developed for business (Abongile, project partner).

Large-scale shack communities are being set up on land that is publicly owned and often displays wetland characteristics, leaving dwellers extremely vulnerable to environmental hazards yet unable to improve their living situation or move, according to respondents:

Obviously, because some of them, they build their houses on wetlands because those are the only that is the only land that is available that is not used. [...] Those people are very vulnerable to all the weathers. So they don't really have time to think about planting trees, about all of these things, or thinking about

his land. They need land, and access to things. [...] When they see land, they relate to the land by thinking, okay, I can put up my houses there (Abongile, project partner).

I can tell you when the community started moving in in that section, they were told that that space is not feasible for any type of housing. But people still continue because at the time it was dry, a little bit dry. [...] And then when the rain came, then they started to understand why, you know, but it would have to be like a government initiative or a city initiative to relocate people. Yeah, but most of the times you would find that if you relocate people, they're in that situation. You'll find other people will come afterwards and put houses (Gugulethu, project partner).

The overuse and poor maintenance of public infrastructure in dense, informal settlements can significantly impact residents' health and well-being. Blocked sewage drains are one example of this issue. Philippi Village executives report that water quality and pollution levels are of high concern for residents' health. Furthermore, climate change exacerbates existing risk factors, such as flooding, high temperatures, and food shortages.

5.1.2 Economic Pressures

Even though many Black South Africans move from the Eastern Cape to Philippi to find job opportunities and stable income, Philippi reports high unemployment rates. The issue is manifested by a lack of infrastructure (electricity, wifi, space etc.) and opportunities to upskill, as well as gangs threatening businesses and demanding extortion fees. This detrimental cycle makes youth susceptible to crime and gang affiliation:

Give people something to do, they must not be easily found on the streets. I know these people are not sent to do bad things. Some is because of the peer pressures, some because they got nothing to do. [...] Don't give money to them. Give them space. Let them run those programs, train them (Mbulelo, local representative).

People are not safe because most of the time when you go to work or you come back, you are stressed that you may not get home or to work in one piece because most of the people they don't like to, they don't want to work, especially they just want to take from the people (Sibabalwe, resident).

Even though the physical characteristics of the land make it unproductive in many areas, participants, including Kumkani, describe Philippi as a hub for agriculture:

I don't know the exact stats, but I know Philippi is one of the the places in Cape Town that supplies a lot of food. Yes, yes, yes. We have the agri hub. There's another farm in like Samora side (Kumkani, local representative).

However, most of the produce is sold to retailers and does not reach the local population, says Layla:

We all speak about food insecurity. You can see it in township spaces like this. And it's frustrating that it's in a place like Philippi that makes so much of the Western Cape's vegetables. That these townships are clearly experiencing the, the climate change clearly affects food security issues (Layla, project partner).

Significant barriers to small-scale agriculture appear to be, firstly, a lack of space and productive land since the area is, and secondly, a lack of knowledge and training.

5.1.3 Political Pressures

From a political standpoint, townships such as Philippi are experiencing inadequate public service delivery. Although Apartheid has been abolished, residents still feel its legacy and feel structurally marginalized. This is consistent with inequitable urban landscape designs, as discussed in Chapters 3.1 and 3.2. Respondents expressed significant frustration with the City of Cape Town's disproportionate use of funds between high-income and low-income areas, as well as its lack of public services, including infrastructure maintenance, waste collection, supply of clean water and electricity, and disaster relief. For instance, Kumkani mentions:

And that's classic you'll see the city of Cape Town will pump Sea Point in like an hour. Yeah. When it's flooded (Kumkani, local representative).

It has been noted that city officials and service agents, such as those involved in garbage collection, are unable to access the area due to high crime rates and the necessity of police escorts. A further obstacle is the absence of electricity and the frequent power outages, which

can last up to four days. These are not necessarily indicative of the household's financial capacity but rather reflect the inadequacy of the electricity infrastructure¹. Subsequently, individuals residing in informal dwellings are illegally connecting to power sources, resulting in a high number of shack fires. The resident's frustration is summarized by Sarah saying:

I think, something that a lot of people say about the city, the city of Cape Town, like the slogan is 'the city works for us.' And then it's like, who is this us? You know, it's like the city works for some people and it doesn't work for other people (Sarah, project partner).

As outlined in Chapter 4.1.3, a matter of urgency in Philippi is the blocked water detention basin, a public good of the City of Cape Town. Gugulethu, an executive at Philippi Village, has stated that Philippi Village has contacted city officials and exercised pressure on city officials to resolve the issue for multiple years, as the ponds are prone to overflow in high precipitation periods, with the water leaking into the adjacent settlement:

So we've always had tried to, even, bring that attention to the City of Cape Town because that is a water retention pond. [...] There are drains that are there, but those drains are not working. It's not meant to hold the water, like, all year round. And then the water is supposed to be channelled to other sections until they reach, a place where they can discharge. [...] And most of the time they'll tell us they don't really have budget to fix them, but they will include it in the next budget (Gugulethu, project partner).

5.1.4 Environmental Pressures

The Cape Flats' physical characteristics do not make the area naturally fit for residence or agriculture, as described in Chapter 3.2. The environmental pressures most frequently mentioned by participants were flooding and the blocked retention pond, pollution, lack of greenery, and unproductive soil. Compared to other parts of Cape Town, wildfires and heat appear to be less of an issue in Philippi under climate change.

¹ South Africa's electricity supplier Eskom has experienced significant difficulties with the rising energy demand, introducing a loadshedding regime with scheduled power cuts in 2007 with townships facing disproportionately long power outages. As of 2020, 20,000 Capetonian households were permanently not publicly serviceable, according to city officials (Lemanski et al., 2025, p. 5).

Multiple participants shared their experiences with changes in temperature and rainfall patterns:

Early this year it was hot as we don't experience like too much weather or too much cold. Too much rainy. Yeah, yeah. So we today it's raining. Tomorrow it's hot. Then day before it's warm (Amyoli, resident).

But this year it seems seems like we're not going to get a lot of rain this year which is cool. So last year and then in the year 2023, that was the baddest year we've got like a lot of rain. [...] And when it rains, the water floods and over and, waterlogged because there are no trees to actually absorb all the water or the soil is not worked enough to absorb the water (Abongile, project partner).

I've noticed that in the past couple of years, maybe 2 or 3 years, we've experienced like really high rainfall seasons. That leads to a lot of flooding. That even leads to sections, maybe of our site that wouldn't necessarily flood (Gugulethu, resident).

The interviews have clearly shown that rainfall and flooding have intensified in recent years, affecting the entire township due to blocked drainage systems and the soil characteristics. Informal dwellers, however, are especially affected, as urban greening executives Abongile and Sarah explain:

So when it rains a lot then the water table is already high because most of the sand dunes are wetlands. The water table also just rises. And then you like have water coming from above and water coming from below. And it's like you can't really do anything about it. So people who are, who have built their houses in sand on or don't have concrete, they are the ones most vulnerable or people who live in wetlands (Abongile, project partner).

They'd be dealing with, more extreme weather events, which also could be resolved if, EBA strategies were implemented to better manage water. And, even just the fact that a lot of these areas are on what was historically like a wetland area. It's normal that it would flood during the winter, but if you were to try and put a residential development there, you would need to develop it properly so that it doesn't flood. But that didn't happen (Sarah, project partner).

The wetland characteristics not only make it challenging to build in Philippi but also to plant. According to Philippi Village executives, the site's backland tends to maintain a high-water table during winter and needs to be developed accordingly before any agricultural projects. In recent years, trees planted have been lost during flood events, and the main gate is frequently

blocked. Moreover, the Cape Flats display complex soil characteristics according to Jani (project partner), requiring specific types of ground preparation methods and plants, on one hand due to the sandy nature of the ground and on the other due to historical dumping in the area. Pollution is an issue in the area still present today, with piles of garbage being dumped beside roads and sewage water leaking, polluting water tanks. Residents describe a lack of public waste sites and garbage collection as causal, but also insufficient environmental awareness. Layla also mentions fires in informal communities as an issue:

What that results in, in terms of people trying to keep their shacks home warm, their homes warm. And then we're dealing with shack fires so frequently. In my couple of years here, I've seen entire, settlements go down because of shack fires (Layla, project partner).

What is more, the uneven greening patterns between inner-city Cape Town and the Cape Flats affect residents' physical and mental well-being and intensify urban heat as well as flooding. Philippi is not only faced with pollution in the form of waste but also poor air quality and noise pollution, due to the density. Available space is used for shacks and informal infrastructure, leaving the area under greened. Abongile specifies:

When it's hot, it's too hot because there's no shade for people. When it's windy, it like, it gets too windy because there's no buffer from the trees. [...] I know it's difficult for for other people because everybody's just so close together. There's not even a space for a tree (Abongile, project partner).

Abongile later continues on how greening might even affect crime and community behavior:

I take my team, and people from the community on hikes every month, and when they get there, they are like ah the air is even fresher here. [...] And that makes me understand that if we would have a lot of green spaces around townships, it would really like even decreases the crime. I feel like. Because people feel you go outside and there's so many trees and you see the bird, even if you upset your neighbor, you're going to think twice about it and then you're going to talk. And rather than just stab that person, you would go talk (Abongile, project partner).

5.1.5 Cultural Pressures

Cultural vulnerability is an abstract concept that cannot be fully understood through brief interviews alone. However, what can be extracted from the interview data is that apartheid and its aftermath diluted cultural heritage. Most Philippi residents are economic migrants from the Eastern Cape. They often leave their culture and community behind to live in Cape Town's townships. Life in these townships has been described as “chaotic” (Edgar, local representative) and “permanently temporary” (Fanizwa, local representative). As residents compete for jobs and housing, stress mounts, and trust, community spirit, and attachment to the area can diminish. This leaves them feeling detached from their cultures and vulnerable. This can be seen in interviewees describing feelings of hopelessness and a loss of dignity in the townships.

5.2 Capacity Building

Since capacity building aims at addressing specific vulnerability components, it is reasonable to group the findings in a similar manner, namely by reported capacity building on the levels of social, economic, environmental, political, and cultural. Referring to the coding frequency, the most prominent impacts were reported in the realms of well-being/recreation and income opportunities.

5.2.1 Social

In the context of Philippi, where residents frequently encounter challenges related to feelings of being overwhelmed, stressed, and not safe, respondents indicated a high value placed on the recreational benefits of the Green Zone. It has been noted that the facility serves as a space where residents and employees at Philippi Village can rest, form bonds, and engage in physical activity. As Kumkani (local representative) articulates, the facility serves as a medium for “unwinding and detaching from trauma.” The placemaking design of the backland space was conceived to accommodate a running track, a soccer field, a playground, and other

facilities near the Green Zone. While some respondents reported that residents, particularly the youth, interact with the facilities rather than the Green Zone, others emphasized the positive side effects of the lush natural environments. Dumisa, a resident of Philippi, reported utilizing the adjacent running track multiple times per week, allowing him to complete the Cape Town marathon in the previous year:

[...] especially on training, because when you're doing your exercise and then at the same time you're in the, in the, environment like that one. You always have that smell from the garden. It, it is good. [...] I would love to see the, the children that are growing up. They can also come here and then they can also participate because it's good to train here. It's safer and yeah (Dumisa, resident).

Fanizwa and Fazile, executives at the local legal center, describe the value of spending their work breaks in the greened areas and the future potential they see:

It's our way of de-stressing. So we'll take our lunches there. We'll walk around the park and discuss some things, or if maybe we want to discuss some ideas. So it's our way of finding motivation, knowing that even though we are in in a concrete environment, there's life outside. You see there's hope. And yeah, when you come back, we come back energised. We come back knowing that we have done something. So yeah, it's a very beautiful site for creatives as well because it's not just only the plants that are there, the murals, there are benches there, also the biking, side trails. So when you also there you just view the activities that are happening, the kids playing at the playing grounds with swings and all those things. So yeah, we were also saying, it could be very nice. We can have a yoga class also (Fanizwa, local representative).

Representatives of Philippi Village and Greenpop both emphasize wanting to host more volunteering and community engagement events at the Green Zone in the future. Gugulethu, Philippi Village executive, and Edgar, community engagement manager at Philippi Village, describe the well-being impact from their stance:

Because I think such spaces also contribute to the wellbeing of people you know, contributes to, even if you're undergoing any pressures. Just grounding you, you know? (Sibabalwe, resident)

In our community based programs, sometimes I use the outdoors depending on the feeling I want to cultivate for the session. So having them outside around the flowers and greenery is a nice thing because also in in the community there's none of that. It's. It let's them breathe (Edgar, local representative).

Workshops and informal use of the space provide low-threshold entry points for social interaction. These interactions could strengthen social cohesion, reduce isolation, and foster a collective sense of responsibility for maintaining the space. Stronger bonds in the Philippi community have the potential to equip residents better to mobilize collective action and mutual support in the face of environmental challenges.

In addition to effects related to recreation and social cohesion, respondents frequently discussed the knowledge sharing and educational impact of the Green Zone. Philippi Village's urban greening manager organizes periodic workshops in the community garden, providing residents with instruction on various gardening techniques, including the cultivation of food and medicinal plants, and addressing environmental issues. It has been reported that informal knowledge sharing among community members about plants and even issues like littering has occurred in the Green Zone. Sibabalwe, resident, and Abongile, urban greening executive, shared insights on the perceived value of environmental education for the community:

Children could come, on the weekends. [...] Because now they don't know the use of many things. They only see plants, they just chop it off. They just step on it. They don't know how to make it grow. [...] Even the food, they don't understand sometimes the food they eat. It needs to be planted. [...] If they would know those things the younger age I think that could be helpful (Sibabalwe, resident).

[...] also just like, highlighting the reasons why we are going through flooding. Like, not a lot of people understand that we could actually mitigate those challenges by leaving some of that land to plant stuff and actually to plan for the water. So, having the Green zone has also been like a great way to actually educate people about the challenges that we have and how important it is for us to really incorporate greening into the way that we live (Abongile, project partner).

Abongile also noted a more positive sentiment and interest in natural spaces since the project's inception:

When I started, everybody didn't want to do anything with trees. A lot of people tell me 'well, I'm allergic to this, I'm allergic to that'. But now I see them take a stroll, and engage a lot with the greenery there (Abongile, project partner).

Finally, the project fosters social capacity by empowering community members to engage in gardening activities through knowledge and skill sharing. The promise of income does not solely drive this engagement; personal enjoyment and enhancing autonomy in food provision also play a role. Despite the scarcity of space and resources for gardening in Philippi, the Philippi Village backland presents an opportunity to engage in nature-related activities, in addition to smaller community garden projects also existing in other areas of the township. Recently, Philippi Village implemented an initiative to promote horticultural engagement among residents by installing uncycled beds on the building's rooftop, to facilitate the practice of food and medicinal gardening. Abongile, an experienced facilitator of community workshops, elaborates on the efficacy of educational initiatives centered on the propagation of medicinal Indigenous plants, emphasizing their potential to foster self-sufficiency among Philippi community members:

So I've had so many people come to me and say they want herbs, and when I give them, like, I also ask them, would you like us to propagate this so that you can plant it in your own home? And you don't have to come to me all the time? And I think in the past, in the past eight months, I've given, cuttings and pot plants to over 30 people, who wants to have those gardens in their own homes. So I think it also inspires people to want to have the plants in their own homes, to try and mitigate whatever they're dealing with. But a lot of people just come to the site because obviously some they don't have a space to go do it. [...] if people are able to also get their food from the garden, and then get their medicine from the garden, it changes something in them (Abongile, project partner).

5.2.2 Economic

Economic capacity and livelihood diversification have shown to be prominent dimensions of the Green Zone. Philippi Village's role as a business hub amplifies the economic benefits of the Green Zone, positioning it as a space where green initiatives intersect with micro-enterprise development: "The PV [Philippi Village] site is special because there is so much work needed around the grounds that the capacity building makes sense, there are economic opportunities right on the spot" (Jani, project partner).

The Green Zone fosters economic capacity directly and indirectly by developing skills and entrepreneurial potential. Several interviewees highlighted the site's potential to generate local employment. While only three gardeners are formally employed at present, long-term plans envision the creation of five to 20 jobs. The feasibility depends on available, external funding. According to Greenpop executives, employment is not limited to maintenance work. Still, it includes continuous training opportunities that may enhance participants' prospects in the broader labor market, such as landscaping, urban gardening, or working at a plant nursery. Proposed initiatives include establishing a community nursery, leasing land for food gardening to provide diverse income streams, and increasing community ownership. Gugulethu, Philippi Village executive, elaborates on plans once pruning has made the backland more productive:

So the idea was to divide maybe that piece of land that we've allocated into sections and then be able to lease agreements with people that want to plant, food gardening in there, maybe for reselling the food gardening. And we wanted to also focus on maybe having families or people that want to plant for the sake of having food. And the idea was that those few people then we wouldn't charge for the space, but only have a rate that we agree with, with people that are reselling. So for something like that to work as well, we would have we would need to have collaboration with organizations that can help us with, workshops around how to successfully maintain and produce a food gardening so that it's educational for the community as well (Gugulethu, project partner).

The economic opportunities at the site are not limited to gardening. For instance, record studio executive Kumkani explains that even now, people from the township of Khayelitsha come to the site to take pictures and videos. Such opportunities illustrate how greening can extend beyond ecological benefits to support financial independence and the creation of small businesses.

Moreover, skill transfer plays a central role. Training in propagation, pruning, building skills, self-adaptation, Indigenous and medicinal plants, and food gardening provides community members with knowledge that can lead to subsistence benefits and income-generating skills. Alongside these benefits, they also reduce household food and health expenditures, thereby strengthening local resilience to socioeconomic shocks. Additionally, skills development provides residents with more diverse livelihood opportunities, thereby reducing their

dependence on the challenging job market in Cape Town and offering them more mobility options.

Sibabalwe, one of the garden caretakers currently employed, explained that the skills gained would provide him with the opportunity to move back to the Eastern Cape, where productive land is more readily available:

If you don't have your own place, but you have if you have a land, then you have the finance to do a lot of things with that. [...] I really want to have a project of my own. [...] I put different things in mind, especially chicken and pigs. And I could plant some veggies. And the medicine. I still need to learn a lot about the medicine plants because I have a little experience with them (Sibabalwe, resident).

Finally, the interviews suggest that the Green Zone's economic potential has broader social spillovers. By providing constructive activities and opportunities, the site is perceived as helping reduce crime and youth idleness while fostering empowerment and dignity. As Mbulelo, leader of a grassroots community aid organization, emphasized:

Empowerment, development, employment that will help with that. Because people will develop themselves and they know how to do it and they will employ themselves. And they will employ the others too. And they will create a relationship with other sources outside of just Shoprite [local supermarket chain] and all of those. So it's going to be a broader thing. That thing can bring down the crime (Mbulelo, local representative).

5.2.3 Environmental

Well-functioning natural environments can be considered a capacity in and of themselves because they provide numerous benefits to the population. For example, they mitigate air pollution, decrease urban heat islands, and promote biodiversity (Laforteza & Sanesi, 2019).

Respondents specifically mentioned the benefits of composting in connection with the Green Zone. Apart from the broader ecological goals of the Living Landscapes Initiative, project executives emphasized the potential of nature-based flood relief and pruning to prepare the Philippi Village backlands for small-scale agricultural projects. Additionally, selecting specific

plant species can strengthen environmental resilience. According to Jani, urban greening executive at Greenpop, planting Indigenous species from the fynbos biome can address ecological challenges such as high contamination levels in the soil, unproductive soil due to historical dumping, and a high water table. Greenpop executives have stated that they are currently engaged in a collaborative research project with Ardene Gardens², which involves testing and defining tree species that exhibit enhanced resilience to climate change and disease. The primary goal of this collaboration is to ensure the long-term sustainability of the site.

The built environment can also be considered a capacity. For instance, the Green Zone includes spaces for exercise and recreation, as well as elements of cultural heritage and benches for social engagement. While the broader Philippi Village infrastructure should not be confused with the Green Zone's direct impact, it is worth noting that the grounds provide substantial benefits to the community. Residents report that the built environment of Philippi Village offers safety and retreat and furthers economic opportunity by renting out container offices and providing desks, WIFI, printers, and helpful facilities, such as a kindergarten, café, and HIV aid container.

5.2.4 Political

Political capacity centers around the degree of local participation and the degree to which actors influence decisions and governance (Opitz Stapleton et al., 2017). What stands out when analyzing interview findings about the project development is the frequent mentions of bottom-up development and community engagement, not only by project executives but also by residents and local representatives.

Even before the inception of the Green Zone, Philippi Village employed a participatory place-making approach, including asset mapping with more than 3,000 households to identify

² Ardene Gardens is a park and arboretum managed by the City of Cape Town in Claremont, Cape Town.

community priorities. In the ongoing project development, the community, specifically community leaders and ward counselors, are not only to be informed but also informed, for instance, when it comes to who is trained and hired as a garden caretaker or which public grants the organizations may apply for. According to project executives, it is necessary that the project not only benefits the community but also ensures the safety of the project. Philippi Village executives facilitate continuous participation by employing stakeholder engagement executives who attend community meetings and present regular updates on project developments, such as the Green Zone, at Philippi Village. Additionally, they maintain a representative group of five to ten people per street in Philippi Village to interact with. In turn, Philippi community leaders provide regular updates on community matters and emergencies, such as alerts about potentially violent protests or shack fires.

Abongile, Philippi Village urban greening manager, emphasizes multiple times: “Also, like every decision that we make, we have to consider the community. [...] If they don't feel comfortable with having certain types of people in our space, we cannot go against that.”

Statements such as the following show a sense of trust and transparency in the project development:

I think the facilitators of Philippi Village are more professional and more humane to the people you see. I never heard any complaint from our community. [...] And I never had any promise that Philippi Village committed to was not fulfilled (Mbulelo, local representative).

And also, I would say they relate to it culturally because, the name Thembi also came from a community engagement (Gugulethu, project partner).

I remember when we had like a strike here. And then people wanted to like loot, get in, get into our premises and our site and start looting because we're not here. It was very violent. But the community made like a human wall around the site. And they told them that you won't be able to loot. This is our space and this space is for our kids. It's for us (Abongile, project partner).

The bottom-up approach cannot necessarily be said to lead to a stronger political power of the Philippi community on a city or national level. Yet, it does strengthen representation and local influence. For instance, the project hosts volunteer events for corporate partners,

including *WWF South Africa*, *Heineken Beverages*, and *BOS Ice Tea*, where they can experience Philippi and receive a guided tour, learning about its challenges and opportunities. Furthermore, Philippi Village acts as a connector between Philippi and the City of Cape Town by establishing partnerships and exercising pressure on government officials within their realm of power.

Regarding political interactions with the city government, the project partners indicate that, in principle, the project aligns with the City of Cape Town's broader climate adaptation and resilience strategies, which include plans for 2050 and targeted measures for heat mitigation and climate change adaptation. Yet, practical cooperations have been limited so far. As one Greenpop representative reflected, while their projects clearly contribute to city-level goals, "it always seems as though [the city] doesn't have a lot of funding to put towards the type of work that we're doing." Simultaneously, respondents acknowledged the complexity of urban governance in Cape Town, where contradicting livelihoods and priorities compete for limited resources. For Philippi Village, this represents both a challenge and an opportunity. On the one hand, the lack of municipal involvement means that the project operates primarily in isolation from state-led urban planning. On the other hand, this may prevent project scaling, while partnering with government or other non-profit actors holds the potential to revitalize underutilized state-owned land across Cape Town. What appears to be lacking is a collaborative structure, as Sarah, Greenpop executive, explains: "There are many different organizations doing urban greening in Cape Town. It would be a good idea if they just had like a committee where it brings us all together to meet every quarter and make sure we're all following the same best practice."

What is worth mentioning is that the recurring theme is the sense of ownership and pride in the site, motivating community members to safeguard and maintain it. As Kumkani (local representative) stated: "Now the community has a sense of ownership, we need to protect the space". Abongile (project partner) described residents putting themselves "[...] on the crossfire just to protect the space" adding to this by explaining that Philippi Village is one of the only organizations in Philippi exempt from extortion fees. This active engagement can be said to represent a form of political capacity, as it builds collective responsibility and

strengthens the legitimacy of local initiatives, benefiting the community. However, respondents mentioned room for improvement when it comes to outreach, stating that there are still a lot of people in the community who do not know about events happening in Philippi Village and the Green Zone, as one respondent noted:

They don't know what you mean when you're talking to them about Philippi Village. I say to them, and they just see those containers. Some they will be afraid to come in. They don't know what is happening here. I can tell you, you can see a lot of people don't know of the benefit that they have that here. (Mbulelo, local representative).

5.2.5 Cultural

As discussed previously in the chapter on cultural vulnerability, township residents often experience a dilution of cultural heritage and feelings of loss of pride. The project aims to expand this capacity by embedding art, symbols of heritage, and spaces for collective interaction into its design and activities. As Gugulethu explains, public participation is, again, central to cultural heritage initiatives:

I would say they relate to it culturally because, the name Thembi also came from a community engagement. Because Thembi means hope. And they said, the community said that they feel like that. Philippi Village reminds them of hope, you know (Gugulethu, project partner).

Similarly, murals created in collaboration with residents reflect a linking of global issues, such as Palestine and Congo, to the local context:

You know, so, like the mural of Palestine. Yeah, that was in collaboration with the community. 'Do you want to see this mural here?' 'Is this mural important to you?' Community came up with the idea now: 'But what are we saying about the violence that's happening in Africa?' So that was also incorporated in the mural as well, the violence happening in Congo [...] (Kumkani, local representative).

Cultural capacity is also nurtured through spaces of social gathering. Interviewees highlighted the value of having safe and aesthetically pleasing environments in which residents can meet, celebrate, and that foster intergenerational engagement. Whether through women's circles,

men’s mental health initiatives, children’s reading sessions initiated by Philippi Village, or wedding photographs being taken, the Green Zone appears to act as a space for collective identity formation and strengthens social cohesion. Planting activities themselves were described as symbolic acts of unity: “if we both assist each other to plant this seed, we... form a bond right there” (Edgar, project partner).

The representation of Indigenous plants not only provides ecological advantages but also further contributes to cultural affirmation. For some participants, seeing the lavender, rosemary, or Indigenous herbs evoked memories of their childhood in more rural parts of South Africa, the Eastern Cape (Fanizwa and Fazile, local representatives), further discussing the importance of this continuity of Indigenous South African traditions for children in townships.

5.2.6 Overview Table: From Vulnerability to Capacity

Table 2 summarizes the salient findings with regard to vulnerabilities and capacity built by the project in Philippi across the following dimensions: social, economic, environmental, political, and cultural. The findings highlight the multidimensional nature of capacity building in informal settlement contexts and the importance of participatory approaches.

Factor	Vulnerability	Capacity
Social	• High violence and organized crime • Youth marginalization • Mental and physical stressors • Lack of safe public spaces for social life, economic opportunities and recreation • Informal settlements	• Safe spaces for recreational activities • Promotion of mental well-being and relaxation • Workshops & informal gatherings foster social networks • Potential for strengthened cohesion & mutual support • Environmental education and informal knowledge sharing

Economic	• High unemployment rate • Reliance on low-wage, insecure jobs • Limited access to land, capital & markets	• Job creation on-site • Upskilling (gardening, landscaping, plant propagation, building) • Harnessing networks and promoting corporate partnerships • Opportunities for micro-enterprises (nursery, food gardening, creative industries) • Increased household self-sufficiency & livelihood diversification
Environmental	• Flooding & naturally high water table • Soil contamination & historical dumping • Heat stress • Limited green cover • Blocked drainages & retention basin	• Composting & waste management • Soil improvement • Indigenous plants for ecological resilience • Flood mitigation & water management • Safe, multifunctional built environment (benches, gardens, recreation areas) • Increased biodiversity
Political	• Limited political power • Insufficient public service delivery • Marginalization in municipal resource allocation	• Participatory planning procedures ensure (asset mapping, placemaking design) • Inclusion of community leaders in decision making • Fostering local ownership & self-sufficiency • Partnerships with NGOs & corporate entities • Potential to expand cooperations on city and national level
Cultural	• Erosion of cultural heritage • Stigma of township residence • Feelings of permanent temporariness • Loss of pride & spatial ownership	• Murals & symbols co-created with community • Safe, aesthetic gathering spaces • Feelings of collective ownership & environmental stewardship • Indigenous plants as cultural affirmation

Table 2. Overview of salient vulnerability factors and corresponding capacities in Philippi from the interview findings. Data collected by the author (2025).

5.3 Place Attachment

Results show that in the case of green adaptation in Philippi, people express heightened environmental stewardship as well as spatial ownership and pride. A significant component of this intervention is beautification. Nonetheless, residential temporariness, which can be viewed as negative place attachment, is common.

Place attachment is characterized by a strong bond with one's environments, including natural spaces, social bonds, as well as rootedness or identity components (Blondin, 2021). In Philippi, however, respondents frequently reported a sense of "permanent temporariness" (Fanizwa, local representative) and being "transient" (Sarah, project partner) that is shaping life in the township. A causal factor may be that the large share of, often temporary, economic migrants in Philippi are socially rooted in the Eastern Cape, as Sarah (project partner) explains:

I think that's probably the case as people move to Cape Town specifically for employment, and many people don't have their families with them [...]. I also think that lends itself to people not feeling at home. If you're not with your family, then you don't really feel like it's your home.

Respondents added to this by saying that this feeling of temporariness may contribute to vandalism and a lack of environmental stewardship, for instance Fanizwa, executive at the legal center, explains:

So this is a place where they temporarily live because of they are trying to get close to the urban areas [...], which sometimes has negative impacts because the fact that they consider it temporary means that they don't have a problem in destroying it, because they know that they're not here for long, so they can vandalize and do all of these things, but other people preserve it because although it's temporary, it's a kind of a permanent temporary because they've lived here and they work here. The kids are growing up here. So it might be temporary but to an extent, you get people that are actually permanently here [...].

According to Fanizwa (local representative), there are varying levels of housing in the township, which also influences residents' place attachment, saying that "once they build a house, then it becomes a permanent".

While multiple respondents emphasized that the Cape Flats were never designed to be inhabited permanently, interviewees repeatedly described the transformative effect of spatial beautification, for instance, by referring to the project as “a safe space and a beautiful space [...] like when you enter those gates of peace” (Kumkani, local representative). Visitors were said to be “shocked” when entering, as “no one could ever imagine that there’s a space like this in Philippi” (Kumkani, local representative). Similarly, Fanizwa and Fazile (local representatives) describe the positive shock some clients have when they enter the space for the first time: “They always say, oh, that place is beautiful. Philippi Village. It feels like you're not in Philippi.” Such reactions indicate a reversal of stigma associated with Philippi, contributing to both external perceptions and internal pride. As Abongile (project partner) explained, beautification “gives them pride to ask other [soccer] teams to come and play in this space, because they are going to see this beautiful thing.” The aesthetic effects of urban greening may play a central role in research sites such as informal settlement areas, which have been described as “neglected, not cared for, often not looked after” (Layla, project partner).

In comparison to this neglect and marginalization, beautification appears to be enforcing dignity and place-based identity. For instance, maintenance of the Green Zone was said to allow people to “see themselves in beautiful spaces,” potentially transforming how they view both their environment and themselves. Other respondents reported feelings of home and peace within the Green Zone:

[...] they feel at home when they are here. They connect with us as well. So for us it has breached that formalities so that when we were inside the garden, there are there are no formalities. We are all one. We are all children of the nature (Fanizwa, local representative).

Feelings of ownership and environmental stewardship may be powerful, due to the participatory nature of the project. As previously discussed, the placemaking approach of Philippi Village and Greenpop puts community wants and needs at the center, making them feel as if this was their space. Moreover, Abongile, Philippi Village urban greening executive, has observed that residents who have actively participated in the planting “come time to time,

they bring their families and say, I was here, I planted this.” Such sentiments highlight the site’s capacity to foster emotional attachment. Finally, place attachment was expressed through the symbolic meaning of greening as a hopeful sign. As one Greenpop executive reflected, volunteers may benefit from having contributed to something tangible that can grow: “I planted this plant [...] it makes me think that I can take care of my family and my community.”

Countering the notion that temporary constructs are easily vandalized and neglected, things that appear meaningful and exhibit belonging shall be protected. Abongile (project partner) finds that prior to the urban greening efforts, a generally lacking “culture of taking care of things” and a “disconnect from the source, which makes us disconnect from each other” were common. Since the inception of the Green Zone and several workshops, multiple respondents report a behavior change, as is evident in the following statements:

And then I started to see a lot of people planting, a lot of people wanting to help me with planting. [...] people come and then they will pick up litter and bring it to me and say, this is what we found at Gogo Thembi (Abongile, project partner).

[...] when I walk around and there are kids around, because I saw them that they love picking up flowers, so I would tell them that when you are harvesting, you don't just break the plant (Fanizwa, local representative).

[...] I remember Abongile would plant at the back and then kids would just come in and just like, rip the plants apart and whatever. But as soon as she started having the learning garden where the kids would come in and she'd teach them about the importance of plants, you know, that plants are actually living beings. [...] So you see the kids also having now that thing of, okay, we need to protect the plants (Kumkani, local representative).

The practical engagement with the Green Zone seems to strengthen attachment. People who have contributed to the Green Zone feel a sense of pride and ownership, wanting to protect and maintain a beautiful space that fosters collective belonging and even draws residents from other townships in. As Fazile (local representative) puts it:

It's a wonderful experience to see people when they have been part of the foundation phase of the whole site and everything, nowadays, they are benefiting from the beauty, so they want to preserve that beauty.

5.4 (Im)mobility

Finally, interview findings will be presented that relate to (im)mobility, namely drivers to stay and to migrate, as well as the role of the Eastern Cape.

The data reveal an ambivalent relationship between residents' sense of belonging and the unlovability of the township. On the one hand, many respondents indicated the multiple push factors that drive a desire to leave Philippi, particularly the high levels of crime, poor infrastructure, unemployment, and inadequate public service delivery. A willingness to move was prevalent, yet so was the lack of better options. As one participant put it: "[...] if people had an option, bro, I don't think anyone would stay here and live with like killers next to them and hear gunshots every night" (Kumkani, local representative). Thato, community engagement and security lead at Philippi Village, adds to this by saying that "it can't change everything that's happening outside. People leave the space, and then it's still difficult." Sibabalwe, resident and Green Zone gardener, similarly said: "[...] many people want to move out of here, but they have no choice. But they would want to move if they could". Participants, such as barista and Philippi resident Amyoli, indicated that, if they were to move, they would move to "town", referring to central Cape Town, rather than another township, since the job market may be even worse.

On the other hand, there were explicit expressions of attachment and reasons to stay, often linked to proximity to employment in central Cape Town, affordability, and the social networks people had built in the area. For many residents, the decision appeared to be strongly conditioned by crime rates: "If I could stay here permanently and not think about going if the crime could go down. It's only the crime" (Amyoli, resident). While acknowledging the structural challenges, respondents emphasized that Philippi Village and spaces such as the

Green Zone enhance quality of life and contribute to a sense of belonging. For example, Layla, Philippi Village executive, explained:

I do believe that greening absolutely influences if people stay in places or not. As a mom, I want to be in a place where my kids have access to that [...] I don't think people are staying in Philippi because there's a green zone at Philippi Village, I do think that maybe that becomes the case later when neighbours go. If I move out of Philippi and I move into another township, I'm not going to be able to send my kids across the road or my kids are going to be able to play.

What is more, the role of the Eastern Cape was frequently discussed – both as a migration destination and a place of origin of many economic migrants residing in Philippi. For respondents, the Eastern Cape represents an alternative lifestyle rooted in land-based livelihoods, cultural continuity, and more space compared to the challenges and density of a township. Abongile (project partner), for instance, described the Eastern Cape as a space where “everybody has a healthy amount of land” and where gardening and subsistence farming, as well as livestock production, could sustain households without the high living costs and pressures of crime that dominate South African cities (Abongile, project partner; Gugulethu, project partner). Retirement migration to the Eastern Cape was mentioned with one participant stating: “Because what they do is when they retire, then they move back to the Eastern Cape because [...] life there is so much cooler because it’s not busy like in the city” (Fanizwa, local representative). Beyond structural considerations, the Eastern Cape was described as an anchor of cultural identity and heritage for Black South Africans. For some, cultivating plants in Philippi thus evoked memories of childhood practices. Primarily due to the rural characteristics, Abongile (project partner) views the possibility of returning to the Eastern Cape as a way to reduce competition for urban land and the rise of unstable living situations: “If we could go back home and start cultivating [...] then we’ll make space for all the people who were actually born in Cape Town”.

While many highlighted their connection to the Eastern Cape, interviewees acknowledged the structural constraints that limit the viability of return migration. While the Eastern Cape offers fertile land, it is infrastructurally underdeveloped, offering limited opportunities for high-quality education or upskilling. Fanizwa and Fazile, executives at the local legal center, link

uneven investments in spatial development to the fact that “the Eastern Cape government is very corrupt” and, consequently, “there is no funding”. This contributes to a lack of job opportunities outside the agricultural sector. As one community member explained, “there are not jobs in the Eastern Cape [...] if you’re not working the land, then you can’t. There’s no retail, no shopping centers.” (Fanizwa, local representative). These challenges underpin the steady flow of migrants from the Eastern Cape to Cape Town in search of employment, education for their children, and “a better life” (Sibabalwe, resident), with the general notion being that if the situation were to improve in the Eastern Cape, many would not hesitate to return.

5.5 Synthesis of the results

In Chapter 2.4, a conceptual model was suggested to capture the interplay between capacity, place attachment, and (im)mobility in the case of the Philippi Green Zone (see Figure 2), based on the literature review. Upon the empirical analysis, this complex interplay is illustrated in a way that is closer to lived realities (see Figure 3).

Firstly, the assessed project has been shown to address context-specific vulnerabilities effectively, thereby building capacity for community-based development and adaptation to external stressors, and consequently strengthening social resilience. Secondly, the Green Zone influences place attachment in multiple dimensions, boosting feelings of ownership and belonging, cultural heritage, and social and environmental bonds. Even though it must be acknowledged that life in informal settlements and under the stigma of townships is challenging for many, residents exhibit heightened environmental stewardship when engaging with the Green Zone, showing a greater inclination to maintain and protect the space. Thus, it shall be acknowledged that place attachment and the green adaptation project mutually influence one another. Additionally, (im)mobility emerges as a central theme: residents articulate a strong desire to move away from crime and poor infrastructure, but structural constraints limit their options. The Eastern Cape serves as both a symbolic anchor identity and a site of return migration, while also driving out-migration due to its lack of

infrastructure and economic opportunities. Thus, it can be said that both place attachment and (im)mobility dynamics are strongly influenced by external factors such as safety, infrastructure, political governance, and economic opportunity that can hardly be outweighed by urban greening. However, green adaptation plays a role in improving livelihoods in this context. It not only influences in-situ adaptation by building capacity across multiple dimensions but also affects migration. Providing residents with skills and knowledge in gardening, agriculture, and related disciplines makes them more self-sufficient and better equipped. Whether they choose to stay in the township and make a living or return to the Eastern Cape, they can live off the land or start a small-scale farming business.

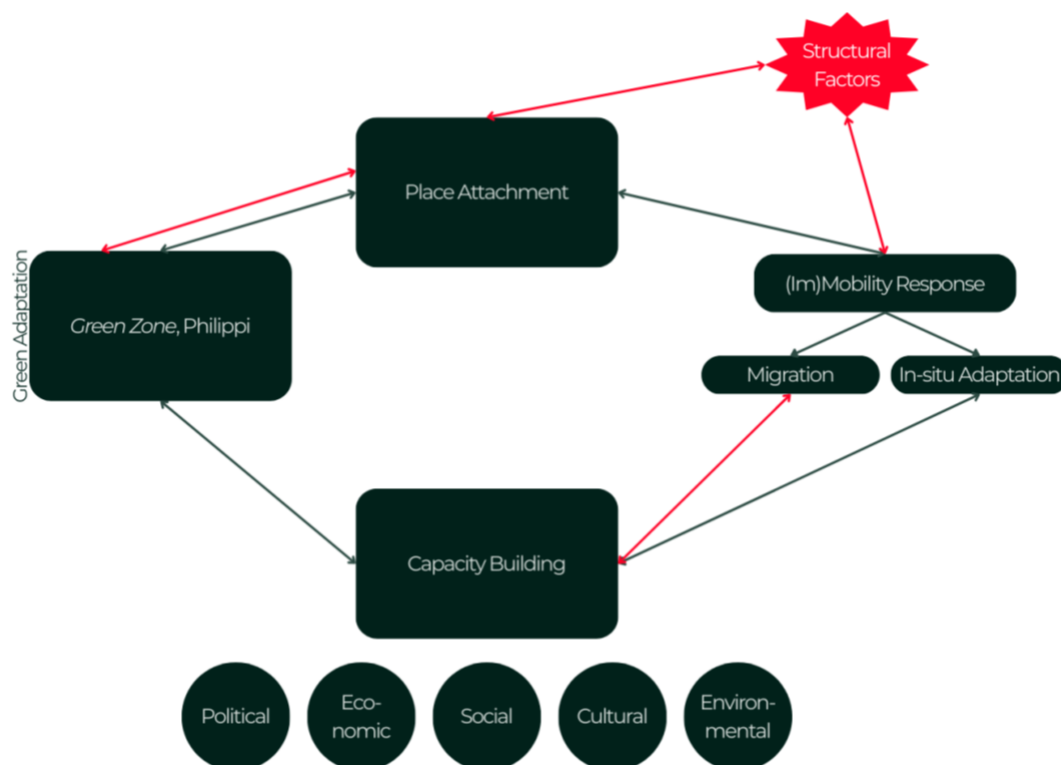


Figure 7. Integrating findings into the interplay of capacity, place attachment and (im)mobility. Data collected and figure created by the author (2025).

6 Discussion

“And on numerous occasions that we've been there, there've been gang shootouts happening in the road, like right next to the site when we're there and the kids just keep playing as if it's nothing's happening because they're just so used to it. And so, like sometimes it's like, what are we doing? We're busy planting a plant and there's this happening. Like, this is clearly not important in the grand scheme of things in this community. However, it is one step in the right direction, and we're taking the steps that we can within our area of expertise.” (Sarah, executive at Greenpop)

6.1 Interpretation of Findings

The following chapter demonstrates how the findings from the Philippi case confirm and challenge existing theoretical frameworks and highlight practical implications for policymakers and non-governmental actors. The following analysis can be evaluated in light of the initial guiding inquiry: Why do communities persist despite adverse environmental conditions, and how can we aid that, build capacity for community-led climate adaptation, and make them thrive?

A synthesis of the findings indicates that, in the case of Philippi, communities' choices are constrained by structural factors, primarily of a socio-economic nature. South Africa's urban spaces and labor market continue to exhibit signs of segregation, a phenomenon that has been deeply entrenched in the country's culture and economy since the Apartheid regime. Additionally, the specific vulnerability context and high proportion of informal settlements must be considered in assessing the impact of the adaptation intervention. Despite the aspiration to relocate to areas perceived as safer or to regions, such as the Eastern Cape, that are considered to offer stronger cultural values and social cohesion, the practical constraints faced by individuals often outweigh the potential benefits. While climate change-related impacts were not identified as a primary migration driver, they appear to be underestimated by affected individuals and are projected to assume a more dominant role in the near future. However, the discourse of the present study has undergone a slight shift, deviating from the concept of voluntary immobility to a more complex form of immobility. Capacity building

within the local community and the concomitant facilitation of autonomy of choice remain paramount in Philippi. The development of capacity through green adaptation, including the preparation of residents to adapt to increasingly frequent flood events and the promotion of their self-sufficiency in food production, has been identified as a catalyst for social change in the township. While structural factors predominate, the sense of place that endures within communities in Philippi constitutes a pivotal psycho-social determinant of adaptation responses. The studied adaptational intervention evoked positive environmental feelings and care, which can be attributed to a desire to change things for the positive instead of practicing neglect towards temporary environments. This approach has been demonstrated to enhance participation, engagement, and the propensity for self-sustainability in adaptation initiatives, thereby amplifying their prospects for success. Therefore, the present study postulates that, despite the relationship between place attachment and adaptation being difficult to define, it is beneficial to strengthen people's sense of place and environmental stewardship. Indeed, this phenomenon has the capacity to shape communities.

6.1.1 Trapped in Place: Social Vulnerability and the Limits of Choice

Referring back to one of the key papers for the development of this study, conducted by Adams (2016), behavioral migration scholars acknowledge that voluntary or involuntary migration lies on a spectrum, and so does the degree to which a population is trapped. Thus, Adams (2016, p. 443) argues:

between being completely satisfied with location, and migration actually taking place, there is a period during which an individual lives under stress, trading off the dissatisfaction with location against the costs of migration [...] this form of immobility can be interpreted as the individual being 'trapped'.

The interview results do suggest that most Philippi residents are dissatisfied with the living conditions in the township, struggling with safety, unemployment, and infrastructural constraints. The interview findings of the present study do not indicate that there is currently a strong link between residents' perceived impacts of climate change and a desire to migrate.

Exposed to many risks at once, respondents did not seem to consider climate change-related effects as the most threatening. Migration drivers tend to be socio-economic (e.g., job opportunities) rather than psychological (place attachment, community bonds, etc.) or environmental (climate hazards, infertile land, etc.). However, the lack of more promising prospects in other townships or rural regions, such as the Eastern Cape, and high living costs in central Cape Town make moving seem out of reach for many Philippi residents. Highly unsatisfied Philippi residents can, thus, be considered *trapped* – a dominantly immobile population.

Although environmental factors are a minor concern for unsatisfied residents, it must be stressed that the future challenges of climate change are likely to place considerable strain on the Philippi community in the coming decades. Changing precipitation patterns and frequency of flooding reported by stakeholders are only the first indicators of adverse environmental conditions. South Africa is substantially exposed to the El Niño Southern Oscillation. Thus, climatic projections indicate the potential for an irreversible tipping point to be attained in the Western Cape within this century, hindering the “City of Cape Town’s sustainable growth, to the extent that it will require a new water resource” (Von Maltitz et al., 2024, p. 183). In the country's Northern provinces, the summer of 2015 was the driest ever recorded, resulting in a reduction in the region’s maize crop yield by 40% (Von Maltitz et al., 2024). The findings are consistent with those of other studies, suggesting poor governance at the national level and unequal spatial planning at the regional level, which makes it plausible to assume that national adaptation measures will prioritize certain urban areas over others. According to scholars such as Von Maltitz et al. (2024), constructing desalination plants is a recommended course of action. However, the feasibility of such a solution is impeded by its costs and the electricity intensity of the process, especially considering South Africa’s inadequate electricity supply . These practical examples highlight two key implications. First, the exertion of political pressure is imperative to ensure the livelihoods of currently underrepresented groups. Second, in the event of government inaction, smaller-scale, bottom-up adaptation rather than government-led adaptation may prove detrimental.

6.1.2 Belonging, Temporariness, and the Ambiguities of Attachment

In Philippi, adaptation behavior is shaped primarily by socioeconomic stressors and safety concerns, while climate hazards act as a secondary driver. A meta study by Jayakody et al. (2024) failed to identify a clear direction of the relationship between place attachment and adaptation. The authors attributed this dynamic to the multidimensionality and deeply individual influencing factors of both the concepts of place attachment and adaptation response. In Philippi, this ambiguity is reflected in the mixed reports of both a sense of ownership and permanent temporariness. Similar findings have been presented in case study-based research, with some linking place attachment to more pro-environmental and adaptive behavior due to place attachment (Han, 2025; Süsser, 2018), while others found place attachment to be a negligible factor that may, in the face of the uncertain and destructive nature of climate, diminish further (Adger et al., 2013; Gurney et al.; Khanian et al., 2018). Jayakody et al. (2024) do, however, a clear dominance of adaptation response in studies describing climate shock (i.e., rapid onset hazards) compared to studies describing climate stress. In communities such as Philippi that are not projected to experience sudden climate shocks, but relatively slow onset impacts such as a continuous increase in annual flooding, climate change may not be perceived as threatening enough to prompt individual adaptation responses, whether it may be in-situ or migration. What must be considered in this geographical context, especially, is the prevalence of other, more immediate stressors such as gang violence.

Further qualitative research is needed to identify the nuances between diminishing place attachment in the face of uncertainty and hazards of climate change, driving migration, and the role of place attachment in voluntary immobility. Further, there is a gap in the literature on qualitative assessments of place attachment and adaptation factors, including cultural and value systems, risk perception factors, and highly context-specific determinants (Jayakody et al., 2024). If these are overlooked, the risk of maladaptation is high, such as in the case of communities in the Gudbrandsdalen area, Norway, where adaptation measures that did not fit the local culture were implemented and subsequently, not adopted by the population, which applied ineffective coping strategies instead (Gundersen et al., 2016). Bernabé & Park

(2025, p. 14) in a study investigating barriers to nature-based adaptation (NbA) in Mexico add to this by emphasizing: “[...] social participation and local knowledge become more feasible when stakeholders are informed and can actively engage in decision-making.” The authors identified insufficient public governance and multisectoral collaboration as primary barriers, further describing how the dissemination of knowledge about NbA and its implications can benefit community-driven adoption of effective measures, “ensuring that solutions are locally relevant and supported” (p. 14). Policy makers must acknowledge scientific as well as local forms of knowledge for effective adaptation and work collaboratively with affected communities.

In the case of Philippi, for instance, the participatory approach at every stage of the Green Zone’s development is a significant success factor, which is in line with findings of similar studies (Gundersen et al., 2016; Totin et al., 2025). Stakeholders report feelings of ownership, pride, and belonging, which are rooted in the collaborative imagining of the space and active engagement with it, for instance, planting or other types of experiences with the space. Acknowledging residents’ preference for workshops on medicinal herbs rather than food gardening is crucial. Empirical research of the impact on participatory tree planting in the Capetonian township of Khayelitsha concluded that green adaptation could redistribute environmental and psychosocial benefits to historically marginalized communities, strengthening social resilience (Gauld, 2015). Like participants in Philippi, the respondents highlighted beautification, pride of place, and dignity as immediate benefits of the Green Zone, alongside expectations of longer-term impacts such as environmental stewardship and enhanced cohesion. Moreover, both studies identify participation as essential for advancing environmental justice, yet in Philippi, participation extended beyond empowerment and skills development to include cultivating ownership and protection of community spaces.

A striking question raised by a study respondent was whether economic opportunity could increase attachment to a place and if such attachment would benefit township residents, as in the case of Philippi. This question is central to debates on urban resilience, where rootedness can be a resource for community empowerment and a mechanism of constraint. From a critical perspective, one must consider whether increasing place attachment

empowers communities or binds residents to an area without opportunities for livelihood diversification (Blondin, 2021). When linked to structural factors such as economic opportunity, place attachment may produce unintended consequences by reinforcing settlement in areas close to economic hubs yet under hazardous environmental circumstances. In the case of Philippi, environmental stressors, crime rates, and structural neglect remain pervasive and heightened attachment risks tethering residents more firmly to unsafe living conditions.

6.1.3 From Greening to Growth: Local Adaptation Pathways

Findings suggest that in this regional context, there lies an opportunity for bottom-up development if structural support were provided for businesses to emerge, corruption were addressed, and earnings were, on the contrary, reinvested locally. Moreover, economic opportunities that strengthen a sense of place can be uplifting if they enable residents to choose to stay while retaining the option to leave. If, however, such opportunities generate dependence on localized resources or are not complemented by broader structural improvements, they risk curtailing mobility rather than expanding it. Therefore, further research is needed to understand the circumstances under which place attachment not only induces environmental stewardship but also broader local development and vulnerable groups. Regarding the Green Zone project, the challenge lies in harnessing the economic potential of Philippi Village as a business hub. With Philippi Village offering container office spaces and support for entrepreneurial activity, positioning gardening within this business hub offers potential for synergies between ecological and economic development and more diversified revenue streams.

The findings suggest that upskilling and employment opportunities are some of the Green Zone's strongest impact factors, yet connecting gardening employees to corporate partners or building a comprehensive training program is not yet on the project's agenda. The provision of educational interventions in combination with microloan options for agriculture or horticulture business purposes within the Green Zone's program may be especially

sustainable in the long run. Since the rise of microfinance (i.e., the provision of small-scale loans for entrepreneurial purposes in low-income contexts) in sustainable development literature in the early 2000s, this sector has risen globally and shown to have considerable welfare impact (García-Pérez et al., 2017; Hazeltine, 2003).

It is essential to the interpretation of this study's results that the unique challenges faced by informal settlements in the context of climate change adaptation are acknowledged. Since townships are the result of racial segregation policies and distinct urban development in South Africa, it must be acknowledged that not all challenges faced by these settlements can be universally applied to informal settlements in other countries, for instance, unemployment rooted in racial discrimination. However, some challenges do bear a degree of universality.

The data points to informal dwellers being the ones most affected by environmental stressors in Philippi, including flooding and large-scale fires. Scholars such as Mashi et al. (2025) point to a research gap on informal settlement dwellers' adoption and barriers to adaptive responses. Findings of their empirical study undertaken in informal contexts in Nigeria show that, even though awareness of climate change-induced hazards was moderate to moderately high in the studied households, adaptation measures were only implemented by 27%. What is more, strategies with positive environmental effects, such as greening or solar grids, were present in less than 10% of households surveyed. Mashi et al. (2025) identified four main explanatory factors in line with similar studies, namely "limited knowledge, infrastructure deficits, lack of finance, and weak institutional support" (p. 7), highlighting that for informal residents, adaptation strategies are not always a choice but are strongly influenced by structural factors. Adaptation strategies have been found to be more effective when applied as a context-specific mixed method approach (Williams et al., 2021). In contexts such as Philippi, combining green adaptation with other modes of adaptation, including educational measures and establishing cooperations such as with other NPOs and public institutions, is detrimental. For instance, educational gaps can be bridged through training programs and volunteering opportunities with casual knowledge transfer at the site. Organizations such as Philippi Village address the lack of infrastructure and accessible financing options, offering safe spaces for business opportunities and broader development. Given that urban African

households are statistically more likely to adopt effective climate change adaptation measures, the higher their levels of education and income, this dynamic could create a positive feedback loop (Acheampong et al., 2023).

However, institutional support has been found to be limited in the context of this study, both towards local NPOs and the marginalized households. The findings reveal a significant discrepancy between local adaptation initiatives and national-level institutional support, even though the initiatives align with, or are in some respects more ambitious than, targets set in South Africa's NAP. Respondents described the absence of public funding, inequalities in spatial planning and natural resource management, as well as a general sense of neglect from the city government. This aligns with critiques in the literature emphasizing the fragmentation of climate governance in South Africa, stressing that local actors often operate independently from higher-level policy processes (Ziervogel et al., 2019; Williams et al., 2021). Grassroots and NPO-driven interventions demonstrate considerable potential to build capacity and resilience. Their long-term sustainability and scalability, however, depend on institutional recognition, funding, and integration into national adaptation frameworks (Williams et al., 2021).

6.1.4 Capacity Building through Collaboration

The Green Zone has made considerable progress in strengthening social, economic, cultural, and environmental capacities. Despite efforts by the involved organizations, political capacity remains underdeveloped. As respondents noted, community members and ward councilors are included in project-level decision-making, yet their broader political participation and influence, particularly in relation to the City of Cape Town, are limited. A quantitative study by Dianda et al. (2025) found a causal effect of equal distributions of political power among groups characterized by gender, social status, urban versus rural residence, on equal electricity access. Findings such as these underscore the detrimental effect of centralized power and poor governance in Sub-Saharan Africa on social and infrastructural inequality. What is more, by formalizing alliances with public and non-public greening organizations,

green adaptation projects could catalyze systemic change and share resources more efficiently. The findings of this study advise the national and local government to advance strategic cooperation as well as public participation in order to ensure equitable distribution of resources and infrastructure development, moving beyond the historical spatial injustices embedded by apartheid (Essex et al., 2024).

Collaborative action in adaptation planning and implementation carries potential beyond immediate community empowerment. It can inform and enhance national adaptation planning. As discussed in Chapter 3.3, adaptation finance is still falling behind, partly due to a lack of robust research on effectiveness and cost-benefit analyses of measures. South Africa's NAP recognizes the importance of local, participatory action. Nonetheless, the lack of institutional support highlighted in this study points to a disconnect between political ambition and action. Integrating empirical evidence from further case studies and insights from practitioners that consider the lived realities of stakeholders, especially the more marginalized households and informal dwellers, would enhance the NAP's effectiveness and legitimacy. Finally, the findings underscore that capacity building is essential regardless of whether individuals ultimately adapt in-situ or opt for migration as adaptation. On the one hand, enhanced social cohesion, skills development, and environmental stewardship can improve resilience for those who remain in Philippi, for instance, by letting them better cope with flooding, crime, and other pressures. On the other hand, capacity building strengthens mobility potential. Upskilling and higher levels of education allow individuals to make mobility decisions more freely, for example, transferring their skills to the Eastern Cape, where fertile land is more easily available and cultural ties are stronger. Thus, whether adaptation pathways involve staying or moving, the importance of multidimensional capacity building cannot be overstated.

6.1.5 Managing the Risks of Green Gentrification

This thesis centers around nature-based adaptation in the form of greening, making it detrimental to discuss the risk of green gentrification (see 2.1.4). The interview findings point

to the integral role of an increase in attractiveness and business opportunities at the study site due to the Green Zone. Connecting the findings with green gentrification literature, it must be considered whether scaling the project might make the area more attractive to outside investors and the effects this may have for vulnerable residents, already facing housing insecurity. While not much data is available on the dynamics of green gentrification in African nations, an analysis of 28 cities across nine countries in Europe and North America revealed that in 60% of the urban greening cases analyzed, there were clear signs of resulting gentrification (Anguelovski et al., 2022). The reported phenomena include higher rental prices (physical displacement) but also more complex socio-cultural dynamics such as reduced community bonds, exclusion from green space or events, etc. (psychological displacement) (Elliott-Cooper et al., 2020; Sax et al., 2022). Kim et al. (2024) found neighborhoods in the US to be especially susceptible to green gentrification if public housing schemes were scarce, green space per person was inadequate, and economic development was a strong pull factor for people to live closer to affluent areas – all of which apply to Philippi based on the findings. The absence of structural protections could mean that vulnerable residents benefit initially from projects such as the Green Zone, yet later face pressures of exclusion. Giving one example from the literature, Wolch et al. (2014) suggest the creation of numerous smaller green spaces throughout a neighborhood rather than one large space to diversify the effects. In the future development of the Green Zone and the broader Living Landscapes portfolio, this could be a potential pathway. In more practical terms, the organization could establish various, smaller community gardens throughout a township instead of one central green space. However, it has to be considered that space for other purposes than housing is scarce in Philippi and that the space might have a limited impact without actively safeguarding the area. For project executives, green gentrification research further implies that continuous monitoring and evaluation (e.g., quarterly community surveys including socio-economic metrics) are crucial. On a political level, such risks could be mitigated by introducing policies that provide vulnerable communities with land titles, expand schemes for public housing, and ensure participation in decision-making (Anguelovski et al., 2022; Kim et al., 2024).

6.2 Recommendations for Policy and Practice

The findings of this study imply several suggestions for policymakers and practitioners in regional contexts similar to Cape Town and vulnerable community settings. Firstly, strengthening institutional alignment by integrating adaptation projects led by community organizations or NGOs into NAPs ensures addressing context-specific vulnerabilities and harnessing collaborative gains. Secondly, it is imperative that local practitioners aim to strengthen local stakeholders' political capacity, whether by connecting small grassroots organizations to public funding opportunities or by advocating for the community's needs. In the context of Cape Town specifically, lobbying towards the city administration is necessary to build the structural foundation for sustaining livelihoods in the face of environmental change. For instance, nature-based solutions offer promising results, but the adverse effects of malfunctioning public drainage systems and infrastructural constraints may undermine the benefits. What is more, in vulnerable contexts such as townships, participatory approaches are key. Not only ensuring consultation but participation in planning and decision-making of adaptation projects secures the beneficiaries' interests. Tools such as stakeholder mapping, asset mapping, and regular household surveys may further mitigate maladaptation.

Green gentrification has been frequently discussed in this thesis, and it is advisable to introduce protective mechanisms at the start of any green adaptation project, for instance, securing land tenure and monitoring socio-economic impacts for residents. However, the socio-psychological effects of environmental change, as well as greening initiatives, may not be overlooked. While the effects of place-attachment on adaptation behavior are highly context specific, it is recommended to promote active project participation and environmental experiences, and thereby a sense of ownership and environmental stewardship. Especially in the context of informal settlements, providing residents with experiences of hope and collective action may be catalysts that cannot be overestimated (Gauld, 2015). Lastly, while green adaptation in itself was shown to promote recreation and have advantages for mental and physical health, paired with upskilling, training, and economic opportunities, it can be said to be a very effective adaptation strategy. By promoting environmental awareness and economic opportunity simultaneously, such projects address the intricate developmental

dilemma of Southern Africa in the face of climate change. It is recommended for policymakers to assess government-assisted housing programs or relocation schemes to avoid displacement by sudden onset climate hazards, as discussed at the beginning of this thesis. From the community perspective, the provision of education and training in food and medicinal gardening, construction, and entrepreneurship allows them to make a viable and dignified choice about whether they choose to stay or migrate. Simultaneously, practitioners must ensure not to promote place attachment in the form of dependence. Urban greening initiatives like the Green Zone should foster pride of place and social cohesion, but remain mindful of not reinforcing settlement in hazardous areas without parallel structural improvements.

6.3 Limitations

Several limitations of this study must be considered when interpreting the findings. First, the size of the population sample is limited due to the scope of the thesis and the methodological orientation of qualitative research. While the interviews were conducted and analyzed following ethical research guidelines and aim to provide nuanced perspectives of relevant stakeholders, they cannot claim statistical representativeness and may not capture the full diversity of perspectives within Philippi. Second, sampling was constrained by practical considerations of safety and accessibility. The inevitable selection bias that privileged individuals already connected to the Green Zone project or suggested by project representatives may paint an overly optimistic picture of the project's impacts. Consequently, the voices of residents living in more precarious or marginalized areas of the township are less visible in the data. These residents may experience environmental vulnerabilities differently or have had adverse experiences with the project. As was mentioned in the preceding discussion, the results of this case study are highly context-specific and must be generalized with caution. Considering the historical developments in South Africa that significantly influenced vulnerability and resilience, it is plausible that barriers and success factors may apply to other cases within the country, though not necessarily to different geographies.

Furthermore, the study focuses on the lived realities of respondents. While these accounts provide valuable insights, they are susceptible to biases, including the tendency to align responses with what is perceived as expected in the presence of an external researcher (Brinkmann, 2018). In the context of an affiliation with Greenpop, this may have reinforced a tendency to euphemize project results. Additionally, the research design captures a single moment in time. While this study paves the way for future long-term assessments of dimensions such as capacity building, it must be acknowledged that the interview findings are temporal and that the effectiveness and impact may change as the Living Landscapes initiative evolves. Without longitudinal data, the durability of dynamic processes cannot be determined. Finally, the scope of the research did not extend to a systematic analysis of the structural drivers of vulnerability and social resilience. For example, factors such as municipal governance, multi-sectoral collaboration, land tenure, and regional economic policies warrant further examination. While these factors are crucial for establishing the framework conditions of community resilience, they could only be addressed briefly in the theoretical framework and indirectly through participants' narratives.

7 Conclusion

This thesis examined the role of the Green Zone project in fostering community-led adaptation, shaping place attachment, and influencing mobility dynamics in the township of Philippi in Cape Town, South Africa, where communities simultaneously face social and environmental stressors. Through 15 qualitative interviews with three stakeholder groups, the study showed that the project addresses context-specific vulnerabilities by building capacities across five dimensions. The Green Zone also shapes how stakeholders feel about their surroundings, with many reporting intense feelings of pride, dignity, and ownership. However, the findings revealed structural constraints, such as crime, insecure tenure, deficient public infrastructure, and structural neglect, which limit the extent to which local greening can build resilient communities.

These insights are important because they add nuance to existing debates on climate adaptation by including non-technical and non-ecological outcomes. The present thesis puts forward the importance of the socio-psychological side of adaptation, including how people relate to places, how attachment motivates environmental care, and how mobility decisions are shaped by opportunity and constraint. At the same time, this study underscores the risks of maladaptation, including green gentrification and reinforcing settlements in hazardous areas without structural improvements.

Grounded in a literature review, the interplay of place attachment, (im)mobility response, and capacity building was conceptualized. This model was then refined based on the empirical findings. Based on the study's data, the influence of climate change-related impacts, such as flood events, was not yet a strong enough factor to influence place attachment or (im)mobility choices. The community may be seen as involuntarily immobile or trapped by their aspiration to migrate, but their tendency to stay rooted in an absence of viable alternatives is influenced by socio-economic factors. Therefore, it is imperative to consider the structural factors in the framework. Nonetheless, this study found that capacity building and (im)mobility responses strongly influence one another. By providing communities with tools to adapt in-situ or make informed migration decisions based on diversified livelihoods and stronger networks, capacity

building reduces vulnerability in the face of climate change in South Africa. Simultaneously, place attachment and green adaptation, the Green Zone, were found to be strongly linked. Respondents felt responsible for the space and were motivated to further develop it together with others, while creating a general sense of care for their surroundings. Historically neglected spaces impacted by the legacy of Apartheid. The pursuit of self-sustainability by the community is a primary objective, and its realization depends on the collective actions of its members.

The significance of these findings lies in their policy and practical implications. First, effective adaptation in marginalized urban areas requires more substantial institutional alignment: projects led by NGOs and community organizations must be integrated into South Africa's National Adaptation Plan (NAP), and the national administration must foster project collaborations both horizontally and vertically. Second, strengthening the political capacity of the affected communities is essential. This may involve connecting grassroots initiatives to public funding opportunities, amplifying community voices in municipal planning, and lobbying city administrations to address structural barriers such as malfunctioning drainage and inadequate public services. If left unaddressed, these barriers have the potential to undermine the full benefits of nature-based solutions.

Beyond these structural dimensions, the findings highlight the socio-psychological importance of adaptation. Although highly context-specific, place attachment can foster ownership, stewardship, and collective action. Providing residents with environmental experiences and opportunities to co-create green spaces with Indigenous plants shapes their sense of belonging and forms social bonds. Projects such as the Green Zone at Philippi Village can foster feelings of connectedness, dignity, and hope. Thus, they act as catalysts for social change that should not be underestimated. Simultaneously, practitioners must remain cautious of promoting attachment that translates into place dependency, for instance, by creating intense economic ties to hazardous areas.

Finally, this study demonstrates that urban greening is most effective when coupled with upskilling, training, and economic opportunity. By simultaneously promoting environmental

awareness and financial agency, such initiatives address the intertwined developmental and climatic challenges of Southern Africa. For policymakers, this implies the need to pair nature-based adaptation with government-assisted housing schemes and relocation programs to reduce displacement risks from sudden-onset hazards. For communities, training in food and medicinal gardening, construction, and entrepreneurship, along with access to microfinance, may expand their capacity to make viable and dignified choices, whether to stay or migrate elsewhere.

Future research should expand on these findings by systematically investigating the long-term impacts of localized greening projects in informal settlements, particularly their ability to influence adaptation decisions and their effectiveness over time. Comparative research across South African townships and other African cities facing similar urbanization and climate change pressures could provide insights into the transferability of lessons learned from Philippi's experience. Furthermore, empirical studies should inform a uniform monitoring and evaluation framework for policymakers and practitioners to ensure the long-term sustainability of such projects, while mitigating the risk of gentrification. Additionally, scholars must address the drivers and influences of the socio-psychological dimensions of adaptation decisions, primarily, place attachment. While the economic and environmental drivers of migration are easier to understand, considering the emotional connection to places will help develop adaptation projects that community members adopt and prevent sudden displacement.

To conclude, the Philippi case highlights how green adaptation, when executed in a participatory manner that addresses context-specific vulnerabilities and is subject to consistent monitoring, can prompt community resilience. Nonetheless, the presence of significant structural issues in Cape Town must be taken into account. Socio-psychological factors, such as place attachment and the emotions evoked by the beautification of urban spaces, are advantages that must not be underestimated. The Green Zone offers a compelling illustration of the potential of green adaptation projects to build capacity for community-led adaptation, whether in-situ or by enabling migration choices more freely. However, it also

underscores the necessity for institutional support, enhanced governance, and multidimensional capacity building.

8 Bibliography

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9 Appendix

Appendix 1

Statutory Declaration

I herewith declare that I have composed the present thesis myself and without use of any other than the cited sources and aids. Sentences or parts of sentences quoted literally are marked as such; other references with regard to the statement and scope are indicated by full details of the publications concerned. The thesis in the same or similar form has not been submitted to any examination body and has not been published. This thesis was not yet, even in part, used in another examination or as a course performance.

Place, Date: Vienna, November 4, 2025

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Declaration on Aids and Tools Used

The following aids and tools were used in the preparation of this work in the following ways.

Software:

1. Microsoft Word: Document drafting, writing and formatting.
2. Max QDA: Transcribing, data analysis.
3. Apple's voice memo app: Audio recording.
4. Canva: Editing graphical images and photos.

AI Tools:

1. ChatGPT: Revising outlines and generating feedback on structure and content clarity.
2. DeepL Write: Spell Checking and sentence clarity.
3. Grammarly: Spell Checking.

Hardware:

1. Personal Devices: Writing and storage.

All aids and tools were used responsibly and ethically. All outputs from AI tools were critically assessed to ensure accuracy and originality.

Appendix 2

Interview Guide

1. Structure

Introduction

Hi, my name is Marlena Niedl. I'm a master's student in *Geography: Global Change & Sustainability* at the University of Vienna in Austria. I'm currently working on my thesis in collaboration with Greenpop, looking at how urban greening projects—like the Green Zone here in Philippi—might influence people's sense of place, community, and how they respond to challenges like climate change.

This interview is completely **voluntary**, and you can skip any question or stop at any time. Everything you share will be kept **confidential**—your name and personal details will not appear in the final thesis or any public document. If it's alright with you, I'd like to record the conversation so I can transcribe it accurately later. The recording will be stored securely and deleted after transcription. **Do I have your consent to proceed?**

Before we begin, is there anything you'd like to ask me?

Thanks so much for being willing to speak with me today. I'm really interested in hearing your thoughts and experiences. This is a conversation—there are no right or wrong answers. If anything is unclear, feel free to ask. Shall we begin?

Thematic Blocks (varying questions for each stakeholder group)

1. Introduction and Background
2. Perceptions of Place and Community
3. Adaptive Capacity
4. Mobility, Adaptation, Future Outlook

Closing

That brings us to the end of the questions I had prepared.

Before we finish-

- Is there anything else you'd like to add that we haven't covered?
- Do you have any questions for me about this project or what will happen next?

Thank you again for your time and for sharing your experiences with me. I really appreciate your insights, they're incredibly valuable for this research. Over the next few months, I'll be analyzing the interviews and writing up the thesis. I'd be happy to share a summary of the findings once it's completed, if you're interested. If you think of anything else later or have any **questions**, you're welcome to contact me at: marlena.niedl@univie.ac.at.

Thanks again, and I wish you all the best!

2. Questions per Stakeholder Group

Stakeholder Group 1: Philippi Residents

- 1. Warm-up**
 - Can you tell me a bit about yourself and how long you've been living in this neighbourhood?
- 2. Place Attachment**
 - What do you value most about living in Philippi?
 - What do you find challenging about living in Philippi?
 - Are there particular places here that mean something special to you? Which ones?
 - How connected do you feel to this land and community?
 - How do you feel about nature and greening around where you live?
- 3. Urban Greening & Adaptation**
 - Have you had interactions with the Green Zone yet? If yes, can you tell us about your experience?
 - Have you or your family been involved in events around it (e.g., gardening, cleanups)?
 - If yes, do you feel like it has created a stronger bond within your community?
 - Has the new green space changed how you feel about the area you live in?
 - Do you think these green spaces change how people feel about this area?
- 4. Capacity Building & Outlook**
 - Have you experienced any change of environment or hazards here in recent years (for example floods, wildfires extreme heat)?
 - If yes, how have you and your family reacted to these changes?
 - Have you gained new skills or knowledge through the Green Zone project? If yes:
 - What specific skills have you acquired?
 - Have these skills helped you or your community cope with environmental challenges like droughts, floods, or heat? How?
 - Have you ever thought about moving away? Why or why not?
 - What would make you want to stay here in Philippi in the long run?

Stakeholder Group 2: Project Partners

- 1. Warm-Up**
 - Could you briefly describe your role in the Green Zone Project?
 - What were the main objectives behind implementing the Green Zone project in Philippi
- 2. Perceived Impacts**
 - From your perspective, how has the community responded to the project?
 - Have you observed any changes in how people use or relate to the green space and their neighbourhoods?
 - Have you observed any changes in community cohesion since the start of the project?
 - Are there stories or feedback you've heard that particularly stayed with you?
- 3. Community-Led Adaptation & Sustainability**
 - What are the biggest challenges that the community is facing at the moment on a social level?

- What are the biggest challenges that the community is facing at the moment on an environmental level? Floodings?
- In Philippi, what are the barriers of local communities to adapt to environmental and social changes?
- How does the Green Zone project address those?
- How is the local community involved in maintaining or shaping the space? Are there any co-creation processes?
- Does the project address the needs of specifically marginalized households in Philippi and allow for participation? If yes, how?
- Which skills and/or knowledge can locals acquire through the Green Zone and related activities?
- Does the Green Zone provide income opportunities or upskilling for the community?
- Does the project foster collaboration with other NGO's, local government or companies?

4. Reflection on Broader Impact

- Do you think the Green Zone has changed how residents relate to their surrounding space and community? (environmental stewardship??)
- Do you think urban greening can affect whether people choose to stay or leave their neighbourhood in the face of environmental change?
- What role do greening projects play in building community resilience with regards to climate change?
- Is there anything else you'd like to share about the project's impact or future?

Stakeholder Group 2: Local Representatives

1. Warm-Up

- Could you tell me a bit about your role in the community?
- What makes working in Philippi special for you?
- What makes working in Philippi challenging for you?

2. Green Zone Project

- Have you had interactions with the Green Zone yet? If yes, can you tell us about your experience?
- Have you experienced any change of environment or temperature where you live?
- If yes, how have you and your family reacted to these changes?
- Have you gained new skills or knowledge through the Green Zone project? If yes:
 - What specific skills have you acquired?
- Has the Green Zone had an influence on your business/ the business environment?
- Have you or your organisation/business interacted with the Green Zone Project?
- What do you think such green spaces mean for the community?
- Has the Green Zone had an influence on your business?
- Do you think green spaces such as these affect people's sense of pride or belonging?

3. Changes & Future Vision

- Have you noticed changes in how people use public spaces or interact with one another since the Green Zone was established?
- Have you experienced any change of environment or temperature where you live? Tell us more.

- In your view, what would it take for people to feel more empowered to interact with natural environments and, for example, start their own gardening projects?
- Do you think people here are inclined to stay long-term or are many considering leaving? Would the green zone influence that?
- What makes the community in Philippi strong and special?

Appendix 3

Coding Frame

Code System	Frequency
Total	474
Philippi Village	0
PV Community Engagement	20
PV General Info	6
PV Greening Projects	2
Recycling Center	0
Perceived Impact of PV	22
PV Finance	6
PV Security	3
Green Zone Development	0
Greenpop General Info	1
Irrigation System	5
Greenpop PV Partnership	10
Corporate Partnerships	5
Long-term Sustainability	8
Female Empowerment	3
Finance	2
City of Cape Town	6
Community Engagement	27
Livelihoods Philippi	1
Political	0
Loadshedding/Electricity	3
Indedaquate Service Delivery	11
Community Spirit	4
Economic	4
Unemployment	5
Food Gardening	10
Social Pressures	0
Addiction	0
Informal Settlements	11
Health Issues	3
Violence	14
Environmental Pressures	0
Invasive species (trees, PSB etc)	1
Retention Pond	5
Fires	1
Pollution	8
Lack of Greenery	6
Soil	2
Heat	1
Floods	16
Capacity Building	0
Environmental	1
Compost	1
Flood Relief	3
Indigenous Plants	1
Cultural	2
Networks, Bonds	13
Murals & Art	1

	Thembis	7
	Economic	0
	Job opportunities	15
	Upskilling (gardening, building etc)	9
	Social	1
	General Education	14
	Recreation & Well-being	27
	Food Gardening/Agriculture	10
	Medicinal gardening	5
	Political	0
(Im)Mobility		0
	Desire to Stay	5
	Desire to Move	12
	Destination Eastern Cape	5
	Migrations from Eastern Cape	12
Place Attachment		1
	Beautification of Space	10
	Environmental Stewardship	12
	Ownership & Pride	13
	Feelings of Temporariness	4