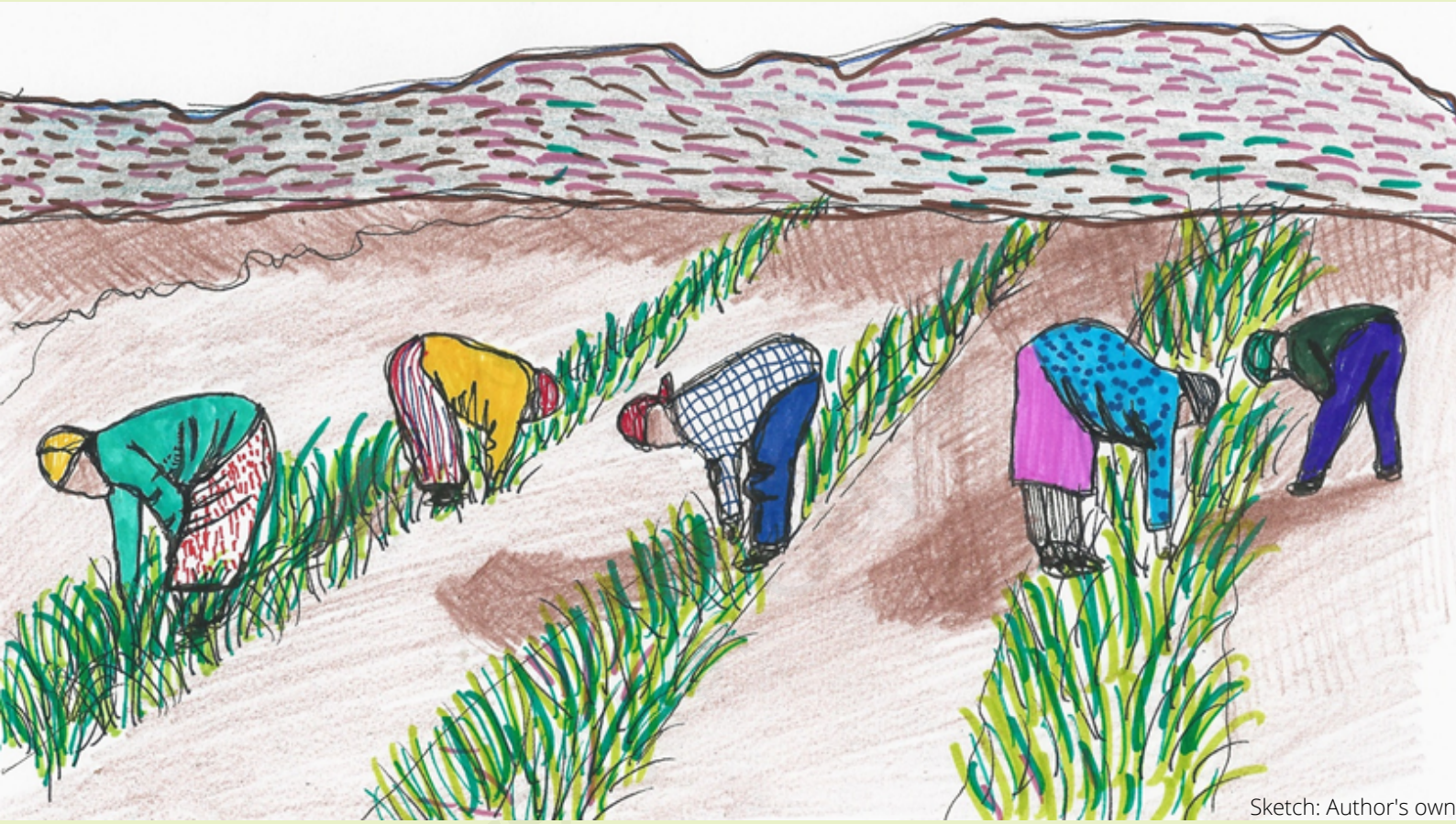
Conceptualising a 'living urban edge' for the Philippi Horticultural Area (PHA), Cape Town.



Sketch: Author's own

Dissertation presented as a part fulfilment of the degree of Masters of City and Regional Planning
In the School of Architecture, Planning and Geomatics
University of Cape Town
November 2021

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Acknowledgements

I would like to thank my supervisor Tania Katzschner for all her efforts and guidance throughout this research journey. Her wisdom, kindness and support has been invaluable in this process. In addition to this, my deepest gratitude extends to the broader Masters of City and Regional Planning staff, and my peers, who have inspired me, supported me and shaped me as a planner. It has been a pleasure learning and growing with such an inspiring group of young planners and new friends.

This project would not have come about without the ideas, input and energy of the inspiring Philippi Horticultural Area Food and Farming Campaign activists, who coined the 'living urban edge' concept. I would like to acknowledge them for this, and for their ongoing efforts in defending the Philippi farmlands which nourish us all. Acknowledgements are also owed to the spatial planners who gave their time for the interviews.

Thank you to the National Research Foundation (NRF) for providing the funding support for the undertaking of this dissertation.

My immense gratitude is owed to my parents, sister Laura, partner Finn and friends for supporting and encouraging me throughout my studies, and shaping me into the person that I am.

Finally, thank you to mother earth for being my greatest teacher and inspiration.

Abstract

Conceptualising a 'Living Urban Edge' for the Philippi Horticultural Area (PHA), Cape Town.

2021/11/12

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The PHA is a large tract of productive farmlands embedded in the Cape Flats district of the City of Cape Town. The farmlands are essential for the City's food and water security, local livelihoods, biodiversity, heritage and access to green space for poor communities. Despite a long-standing policy commitment to protecting the PHA through an urban edge, the farmlands are being constantly eroded by urban development encroachment, pressures and externalities. This dissertation will investigate why this is the case through critically interrogating Cape Town's implementation of the urban edge. Through this, shortcomings in the current approach are identified, and in response to this the author investigates how an alternative approach can be created.

In order to identify why urban development encroachment has persisted in the PHA, critical discourse analysis of relevant policies, site observation, semi-structured interviews with spatial planners, and focus groups with the PHA Campaign are utilized. The author argues that the urban edge has failed to protect the PHA due to the political complexities of top-down implementation, poor enforcement of land use regulations and a lack of proactive and positive planning for the urban-rural interface.

Following this, and inspired by theories of regenerative development and bottom-up planning, the author proposes an alternative novel spatial concept for safeguarding green space from urban development encroachment termed the 'living urban edge'. This concept is co-produced with the PHA Food and Farming Campaign (the PHA Campaign), a group of small-scale farmers and activists who are working tirelessly to defend the farmlands. To this end, focus groups with the PHA Campaign were used to generate design principles which aim to create a positive urban-rural interface for the PHA where urban development encroachment is discouraged. Beyond this, the 'living urban edge' concept proposes a buffer of small-scale farms and blue-green infrastructure positioned around the edge of the PHA which can create a barrier of bottom-up defense against the constant erosion of the PHA. The final product is a spatial concept, piloted in a portion of the western edge of the PHA, which hopes to inspire other cases where green space is threatened by urban development.

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ACT	Area Coordinating Team
APOZ	Aquifer Protection Overlay Zone
CASP	Comprehensive Agricultural Support Programme
CBA	Critical Biodiversity Area
CPA	Community Property Association
CoCT	City of Cape Town
CFA	Cape Flats Aquifer
CFDP	Cape Flats District Plan
CLT	Community Land Trust
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DEAT	Department of Environmental Affairs and Tourism
DHS	Department of Human Settlements
DMS	Development Management Scheme
EIA	Environmental Impact Assessment
FSPUD	Food Sensitive Planning and Urban Design
HPOZ	Heritage Protection Overlay Zone
IDP	Integrated Development Plan
KVLU	Kaapse Vlakte Landbou Unie
LAO	Local Area Overlay
MOSS	Metropolitan Open Space System
MSDF	Municipal Spatial Development Framework
MPBL	Municipal Planning Bylaw
NEMA	National Environmental Management Act

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

Acronym	Definition
NMT	Non-Motorized Transport
NPO	Non-Profit Organization
PA	Protected Area
PAR	Participatory Action Research
PEDI	Philippi Economic Development Initiative
PHA	Philippi Horticultural Area
PoC	People of Colour
PSDF	Provincial Spatial Development Framework
RSU	Rural Safety Unit
SANBI	South African National Biodiversity Institute
SCEA	Schaapkraal Civic Environmental Association
SPLUMA	Spatial Planning and Land Use Management Act
SWSA	Strategic Water Source Area
SUDS	Sustainable Urban Drainage Systems
UEO	Urban Edge Overlay
WSUD	Water Sensitive Urban Design

Abbreviation	Definition
The PHA Campaign	The Philippi Horticultural Area Food and Farming Campaign

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GLOSSARY OF KEY TERMS

1. *Bottom-up planning:* a community-led approach to planning and design, as opposed to imposing ideas from the top-down.
2. *Bridging capital*- social networks which bind communities together
3. *Community*- this dissertation takes on a broad definition of 'community', which extends beyond a group of people located in a specific spatial geography to include groups connected by values, interests, identity and practise (Lachapelle & Albrecht, 2019).
4. '*Core PHA'*- the part of the PHA which remains actively farmed
5. *Entanglement*- an ethical framework which recognizes the interdependence and interconnectedness of humans and the environment
6. *Food Sovereignty*- the right of people to choose what food to eat, where it comes from and how it is grown (Demitz, 2015)
7. *Green/Ecological Buffers or Greenbelts*- protected zones where greenery is established as a barrier around sensitive and vulnerable areas (Godfrey, 2015)
8. *Green space/open space*- these terms are used interchangeably to refer to agricultural, recreational and conservation space.
9. *Living Structures*- living structures are urban systems and structures which embed humans in relationship with the environment. Living structures are by nature adaptive, resilient, spontaneous and self-organizing
10. *Living urban edge*- an urban edge which is structured and defined not by 'hard' cadastral boundaries, but by a buffer of small-scale farmers and green infrastructure.
11. *People of Colour (PoC)*- as opposed to terms such as 'non-white', which defines PoCs in terms of whiteness, the term PoC is becoming increasingly popular in the contemporary moment to describe Black, 'Coloured', Asian and Indian people (Patel, 2019).
12. *Permaculture*- a design approach coined in the mid-1970s by Bill Mollison and David Holmgren, which applies the guiding axioms of natural systems to designing human systems (Hemenway, 2015:x)
13. *Regenerative development*- a development approach which moves beyond sustainable development (reducing impacts) and towards creating a net positive impact.
14. *Regenerative design- a* design approach which aims to bring about regenerative development through design inspired by nature

GLOSSARY OF KEY TERMS (CONTINUED)

15. *Resilience*- in the context of urban and natural systems, resilience refers to the ability of the system to adapt to challenges
16. *Social Capital*- the networks or relationships among people
17. *Speculation*- speculation is a real estate investment strategy where vacant land is bought and held until development interest increases in the area (Cartier, 2021).
18. *Urban/Development Encroachment*- urban development encroachment in this dissertation refers to urban sprawl, illegal land use and the conversion of green space into urban land use
19. *Urban edge*- the urban edge as defined by the Western Cape Government Provincial Urban Edge Guideline (2005) is "...a demarcated line to manage, direct and control the outer limits of development around an urban area" (DEA&DP, 2005). The Department of Environmental Affairs and Development Planning (DEADP, 2005:5) defines the urban edge as "...(a) land use measure...available to direct growth both spatially and temporally." The DEADP further defines the urban edge as both a growth management tool to limit sprawl, and a conservation tool that can preserve certain critical areas within the urban footprint (ibid).
20. *Urban-rural interface, peri-urban fringe*- these terms are used interchangeably to refer to the interface between urban space and open space (both agricultural and conservation).
21. *Urban growth management/urban development controls*- these terms are used interchangeably and describe the myriad of planning strategies and tools which are used to regulate urban land use, reduce urban sprawl and safeguard certain areas from urban development (Fertner et al, 2016:2).

Chapter 1: Introduction

1.1: Preamble and Personal Manifesto: Planning for Living and Regenerative Cities.

"The earth is our mother. What befalls the earth befalls all the sons and daughters of the earth. This we know: All things are connected like the blood that unites us. We did not weave the web of life, we are merely a strand in it. Whatever we do to the web, we do to ourselves."

(Chief Seattle, quoted in Day & Gwilliam, 2020)

1.1.1. Background and Overview

This dissertation emerged from a two-month period of volunteer urban planning work with an activist group, the Philippi Horticultural Area Food and Farming Campaign (the PHA Campaign). This group is working tirelessly in collaboration with residents, farm workers, commercial farmers and aspirant small-scale farmers to combat the onslaught of development pressures facing the PHA farmlands[1], located in the Cape Flats of Cape Town. The PHA overlies the Cape Flats Aquifer (CFA), and hence is also essential for the City's water security, provides between 50 to 80% of Cape Town's fresh produce and harbours sensitive biodiversity (Kemp, 2020:54). In addition to this, the farmlands are a critical source of livelihoods and open space for residents (Indego Consulting, 2018). As such, securing its protection in the face of rapid urban development encroachment is essential for the City of Cape Town's future. The area under study is indicated on Figure 1 below.

[1] See Figure 1 location map

Figure 1: the PHA identified in Cape Town[2].

In working with and learning from this passionate group of activists, I was deeply inspired by the immense planning knowledge and ability that is present within civil society. My work with the PHA Campaign involved the seeding of new ideas for how agricultural land can be protected from urban development encroachment[3], given that the traditional, top-down implemented urban

[2] Source: Adapted from Govender, T. & Mammon, N. 2020. (Image). A Clash of Rights in the Legal and Spatial Planning Contexts: the Case of the Philippi Horticultural Area. *Journal for Juridical Science.* 45(2): 98-127. DOI: https://dx.doi. org/10.18820/24150517/ JJS45.i2.4.

[3] Development encroachment and urban encroachment are two terms used interchangeably in this dissertation to describe the transformation of green, open spaces into urban land uses.

edge[4] planning tool has arguably failed[5] to fulfill its role of defending the farmlands from urban land uses and externalities. This is due to the prevalence of urban development encroachment on green space[6] worldwide, despite the existence of planning protections such as the urban edge. Agricultural and protected land in proximity to urban space is particularly vulnerable to development encroachment and land conversion, especially in the interface between urban and rural space, which is the focus of this dissertation (Kramer & Doran, 2009:349). This land use conflict is intensified in developing countries, where rapid urbanization and the need for housing delivery within the city competes with the need for preserving green space (ibid). In some cases this development encroachment is illegal, indicating that the enforcement and policing of land use regulations from the top-down is often ineffective due to capacity constraints or a lack of political will (Battersby & Haysom, 2012). Thus, planning regulations and development controls are often not achieving their intentions in practise (Rose & Patel, 2016:239).

In addition to this, the planning discipline has engaged very little with how the interface between urban and rural land can be proactively planned and designed in order to cultivate positive relationships between these two land uses which are often framed as competing. The urban edge line is merely delineated with little positive planning. As such, this dissertation aims to take up this challenge and work towards reimagining the urban edge planning tool to create an edge which is 'alive' in that it is dynamic and active. In addition to this, the hope is to encourage positive relationships between urban and rural land, instead of separating it with 'hard', restrictive boundaries, and to enable the defense of the farmlands from urban development from the bottom-up[7]. The concept, termed the 'living urban edge' will be piloted and spatially represented in the PHA, with a focus on its western edge. This will be achieved through a set of clear design principles, and through creating a spatial concept where a buffer area of small-scale farms around the PHA edge assists in defending it from development encroachment, by spatially defining its boundaries and by surveilling the area for any illegal land uses. Figure 2 provides a simplified diagram illustrating the spatial concept that this dissertation will explore.

[4] An urban edge is a defined line drawn around an urban area which denotes its outer limits, in order to protect rural and conservation land from urban sprawl. It is the planning tool which is predominantly utilized for protecting open space from urban development.
[5] See Chapter 2 for an extensive argument in this regard.
[6] In this dissertation, green space is defined as both agricultural and conservation open space.
[7] Bottom-up planning and development is here defined as a citizen or community-led approach to planning.

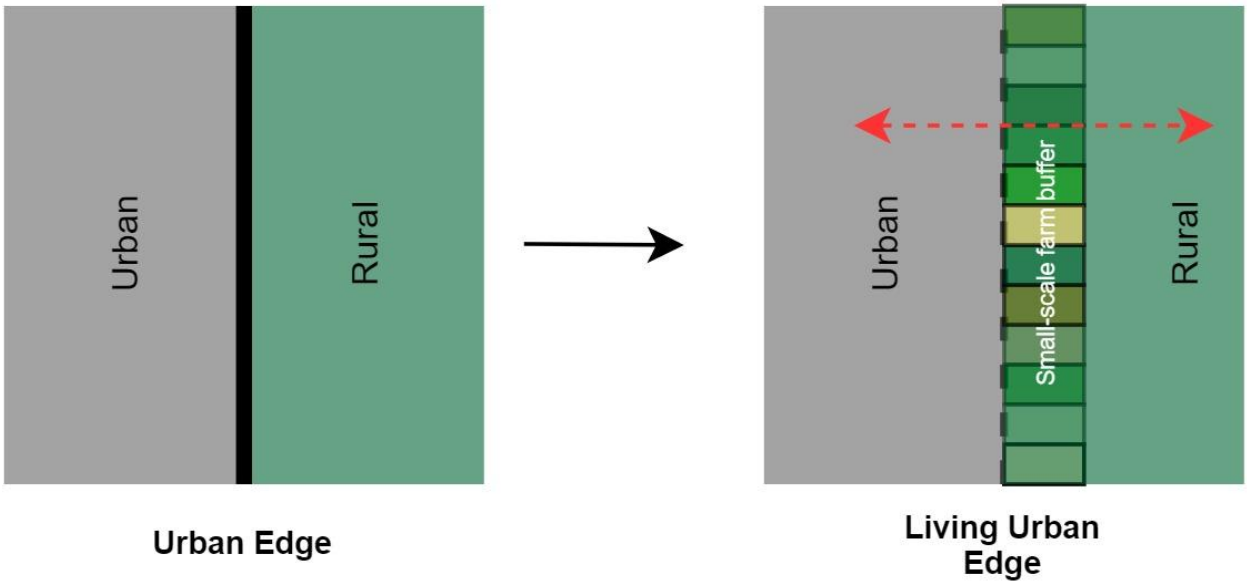

Figure 2: Simplified diagram indicating the proposed 'living urban edge' concept. Author's own.

The 'living urban edge' concept put forward in this dissertation was born from the imagination and place-based knowledge of the PHA Campaign activists, and in this I saw an opportunity to use my understanding of urban planning language and spatial logic to expand and support the planning solutions that the PHA Campaign is proposing. Through this work, a deeper understanding of the importance of including local communities in the conceptualization of planning interventions came about, and this realization will likely shape my approach as a professional planner as I begin my career. I believe that there is a wealth of knowledge and power that already exists on the ground and within the networks that knit communities and systems together. In my view, one of the core roles of urban planners is to facilitate and enhance these self-organizing and adaptive systems which are more responsive to the particularities of place than an outsider, 'expert' perspective ever can be. Through this, we can co-create cities which are more vibrant, organic and alive.

1.1.2. Ethical Standpoint: Personal Manifesto

The world's cities are at a critical crossroads moment. The global megatrends of rapid urbanization, widening inequality, food insecurity, resource scarcity and catastrophic climate change herald a fundamental paradigm shift in the approach to environmental management and planning (Retief et al, 2016:2). The current extraordinary moment of the COVID-19 pandemic also means planners are finding that their world has been fundamentally disrupted and transformed, and as such imaginative new planning approaches are needed. The current system is clearly in a state of crisis, and thus something has to give if humanity hopes to prosper in the long-termen

As will be discussed at length in Chapter 2, traditionally cities have been designed in such a way that urban and natural systems are treated as separate. However, in the age of the

Anthropocene[8] where human activity is driving environmental change and destruction, the imposed dualism between nature and society is breaking down (Lövbrand et al, 2015:211). In addition to this, it is thus becoming clearer that the fate of human and ecological systems are deeply intertwined and entangled. As such the ethics, principles and norms which mediate how humans relate to their environment have a critical role to play in securing more abundant and thriving futures. I believe that instead of removing humans from conservation spaces through a fragmentary, 'zoned' approach, greater efforts should be made to weave society into the landscape (Katzschner, 2013:213). This dissertation thus aims to resist the traditional separation of humans and nature, and instead strives towards nurturing symbiotic relationships between urban and natural systems.

This approach to design can create urban systems which are embedded in and relate to the landscape in a positive way. This can enable the creation of 'living structures', which according to Roös (2021:115) are "...places that have 'soul', and have an inherent pattern language that is part of a generative process." By resisting hard and static boundaries, 'living structures' are more dynamic and 'alive' with interaction and activity. The intervention put forward attempts to create an urban edge which embodies this idea of 'living structures', by designing an urban edge which is structured and defined not by 'hard', physical boundaries, but by the relationship between a collective of small-scale farmers and the land. By creating relationships between people and the environment, living structures are able to cultivate a deep sense of place and hence a will to preserve the landscape. Additionally, in the South African context of rampant socio-economic inequality, connecting livelihoods to the restoration of the environment can create multifunctional solutions to urban challenges. This necessitates a bottom-up and collaborative approach to planning. As argued by Lövbrand et al (2015:212), expanding the realm of possibility in environmental management is only possible through including a broader set of knowledge traditions and communities in the conversation. According to Keen, Brown and Dyball (2005) and Berrisford (2013), given the limitations of top-down regulatory tools such as the urban edge, there is a need for new innovative approaches to environmental planning that support collective action and community-based conservation. The hope is that this dissertation can contribute to the imagining of alternatives to traditional planning mechanisms for conserving land, and particularly alternatives that can contribute positively to local livelihoods and wellbeing, as well as ecological health and abundance. Citizen movements, collective action and collaborative planning hold the potential to highlight the shortcomings of established urban processes and practices, and thus this dissertation hopes to contribute to the unlocking of this potential. As such, the ethical standpoint of this dissertation is one that values local knowledge and community.

The standpoint that humans and the environment are separate and opposing is also embodied by the prevailing sustainable development decision-making framework. Sustainable development narratives argue that social and economic development should avoid the depletion of natural resources, and as such takes on the standpoint that humans are a destructive force on the natural world. This leads to a trade-off decision-making approach, where the pursuit of

[8] The Anthropocene is a geological era in which "humankind has become a global scale force with the ability to fundamentally reshape the planet" (Lövbrand et al, 2015:213).

environmental protection and development is framed as a zero sum game. As will be discussed at length in Chapter 2, the ethical standpoint of this dissertation is that development should strive for systems which benefit both people and the environment. Instead of reducing the impact of humans on the environment, I believe we should be imagining solutions where humans create a net positive effect on the environment. This is termed regenerative development, which aims to better align human systems with ecological systems through designing in harmony with nature's guiding principles. Through this, it is hoped that human systems can work to restore and regenerate the ecological fabric as opposed to acting in opposition to it. In addition to this, whilst the sustainable development paradigm takes on a reactive approach where the focus is on minimizing impacts, I believe that planning should be more proactive in searching for regenerative solutions. Given the urgent need to respond to rising socio-economic inequality and the rapidly changing climate, I believe that a proactive approach is of critical importance.

The hope is that the 'living urban edge' concept can provide an example of a much needed paradigm shift, where environmentally embedded human systems serve to restore ecological prosperity. Whilst the concept put forward in this dissertation may seem radical or unrealistic, I believe that it is precisely this form of thinking which challenges long-held assumptions that is needed given the existential crisis the planet is facing.

1.2: Outline of Chapter

The following Chapter will begin with an outline of the planning issue to which this dissertation responds, hence setting up the motivation for and aim of the study in Section 1.3. Section 1.4 introduces the PHA case study which will be used to explore and respond to the planning issues outlined in Section 1.3. Section 1.5 introduces the research questions, and the methods and techniques which will be used to respond to these questions. Finally, Section 1.6 will explore the limitations of the study.

1.3: Motivation for and Aim of Study

1.3.1. Framing the Issue

The following subsection aims to briefly introduce the planning issue to which this dissertation hopes to respond. These issues will be expanded on in Chapters 2 and 3.

Urban development encroachment on green space is a globally prevalent and intractable planning issue. This land use conflict persists despite the use of planning tools such as the urban edge, which intends to safeguard land from urban intrusion and externality. This tension is especially prevalent at the urban-rural interface, where the city edge meets rural landscape. As previously mentioned, planning has engaged very little with how the urban-rural interface should be designed for and managed beyond defining an abstract and static boundary between urban and rural land through the urban edge (Parham, 2019; Govender & Mammon, 2020; Allen, 2003; Gallent et al, 2006). As mentioned in Section 1.1, it is exactly these 'hard' boundaries which the 'living urban edge' concept aims to resist. In addition to this, a lack of positive design

and planning direction for how the urban-rural interface should function makes this space ambiguous an ambiguous 'non-place' and allows for development encroachments to go unnoticed (iKapa Enviroplan & City Think Space, 2013). This is despite the opportunity that this interface offers for reconnecting city dwellers to the origins of their food. There is therefore a need for researchers to engage with how to plan for the urban-rural interface, and how to better safeguard green space from urban development encroachment given the shortcomings of the urban edge.

These issues manifest explicitly in the PHA, where despite a long-standing policy commitment to protect the area due to its critical importance for the City, urban development encroachment persists (Battersby-Lennard & Haysom, 2012). As articulated by Rose and Patel (2016:235), "Environmental policy is a complex decision-making arena where many conflicting interests are weighed up...in a context of uneven power relations." This is the case in the PHA where the urban edge has been persistently amended by political decision-makers to accommodate big development applications (Battersby-Lennard & Haysom, 2012). These amendments are happening incrementally, but with a large and destructive cumulative impact on the overall footprint of the PHA, leading to its 'death by a thousand cuts.' As such, the PHA edge needs to urgently be secured, and the long-term future of the farmlands need to be proactively planned for, in order to halt this constant erosion.

1.3.2. Responding to the Issue

Given the issues previously outlined, this dissertation aims to put forward proactive design guidelines and principles for how the urban-rural interface within a metropolitan area can be planned for in a way that creates positive, regenerative relationships and enables the safeguarding of agricultural land from the bottom-up. Particularly, this dissertation aims to explore how unique and ecologically significant farmland embedded within Cape Town's urban fabric (the PHA) can be better safeguarded from development encroachment through a collaborative planning process with the PHA Campaign. It will be argued that a bottom-up approach can avoid many of the political complexities which limit the effectiveness of the current approach. Due to the existence of a mobilized and passionate activist group in the area (the PHA Campaign), the PHA again offers a valuable case study for achieving this aim. Thus, these ideas and aims will be pioneered and enlivened through the PHA case study, with the hope that the principles and spatial concepts generated will be valuable for areas facing similar issues.

1.4: Scope of Study- Outlining the Case Study

The PHA, a large[9] agricultural landscape in the heart of the City of Cape Town (CoCT) metropolitan area, is a highly contested space in which the planning issue outlined in Section 1.3 manifests. This is despite the fact that multiple studies and reports have identified the unique cultural, social and ecological value of the PHA[10] at the regional and potentially national

[9] The "core" of the PHA, where intensive farming occurs, is approximately 1884 hectares, whilst the "greater" PHA is 3169 hectares and includes the 'buffer' area around the core farmland (Indego Consulting, 2018). The buffer area includes a mix of land uses (ibid).
[10] This will be addressed in detail in Chapter 3

scale (Battersby-Lennard & Haysom, 2012; Indego Consulting, 2018). CoCT officials have repeatedly acknowledged the value of the PHA through land use constraints and policy documents, and the area has been (albeit inconsistently) protected by an urban edge since the 1960s (Indego Consultants, 2018). Despite this, as previously mentioned, the area has been constantly under threat from development encroachment. In this, top-down land use policies and regulations have failed to safeguard the land and protect both the public and ecological interest

However, as previously mentioned, the PHA is also a space of possibility and opportunity due to the strong community mobilization spearheaded by the PHA Campaign. The failure of the public sector to protect the PHA has sparked a strong reaction from concerned citizens. According to Battersby-Lennard and Haysom (2012), there is a "...new and active group of committed emerging smallholder farmers...investing significantly in the land and in their communities." This is despite narratives put forward by certain city officials and developers that farmers in the area are disgruntled by security concerns and wish to sell their land, and that production in the area is declining (Battersby-Lennard & Haysom, 2012). As such, this dissertation aims to draw on the potential of this mobilized community to investigate how community-based initiatives can be harnessed to better define and defend the edge of the PHA, and promote bottom-up planning practice.

Existing research into the PHA has largely focused on articulating the importance of the area, with insufficient attention to how it can be proactively protected and enhanced given the failures of traditional planning tools and policies. Internationally, successful precedents of bottom-up land use protection as an alternative to state-enforced conservation exist, as will be addressed in Chapter 2 (Cullen et al, 2013; Marcus & Morse, 2008; Gripper, 2020). However, the case of the PHA is unique as the land area is a large and well-located area of rural status in close proximity to the city center (Battersby-Lennard & Haysom, 2012). In a context of significant spatial inequality and need for social housing close to job opportunities, the site is thus subject to intense development pressure (ibid). According to Battersby-Lennard and Haysom (2012), there are "...no blueprints as to how to engage with such an area, either in South Africa or internationally" and that "...the very complexity of the area means that novel and innovative ways are required to facilitate...the effective governance and protection of the area." Additionally, existing research that looks at community-enforced conservation has not taken on an explicitly pro-poor approach that aims to combine conservation of open space with the support of local livelihoods and wellbeing. In the South African context, such an approach to conservation is essential in order to redress post-apartheid inequality. The hope is that this can inform more regenerative responses to other cases[11] of development encroachment upon green space.

[11] These cases will be outlined in Chapter 2.

1.5: Research Design

1.5.1. Research Questions

Based on the research aim outlined in Section 1.3.2, the following main research question will be the focus of this dissertation:

How can the PHA urban-rural interface be proactively planned, in response to the shortcomings of the urban edge, in such a way that regenerative relationships are created and the land is safeguarded from the bottom-up?

This main research question is supported by the subsidiary research questions below, which are more general and will inform the literature review (Chapter 2) and contextual analysis (Chapter 3):

- What are the issues with the current approach (urban edge) and how can it be improved and reimagined?
- How can bottom-up, community-led planning and governance enable the long-term conservation and protection of land from development encroachment at the urban edge?
- What proactive design principles can be generated to better define the urban-rural interface?
- How can spatial arrangements, form and pattern be used to safeguard land from urban encroachment?
- How is community-led planning essential for enabling regenerative and resilient cities?
- How can the PHA Campaign's idea of a 'living urban edge' be translated into planning language and a spatial conceptual framework?

1.5.2. Research Methods and Techniques

The following subsection will introduce the main research methods and techniques which will be utilized to investigate the research questions. There is a subtle difference between research methods and techniques. Research methods are the methods which the researcher employs to respond to the problem under study. The research method is supported by research techniques, which are the means employed for collecting the data necessary for responding to the research questions (Winkler, 2021). For each method and technique, limitations will be discussed and responded to.

1.5.2.1: Methods

i) Case Study Research

As introduced in Section 1.4, this dissertation employs the case study research method by exploring the 'living urban edge' concept in the context of the PHA. As previously discussed, the PHA was selected as a case study since it is well-positioned to answer the research question. This is due to the existence of a clear issue with the current approach to preventing

development encroachment on the farmlands, as well as an existing community group committed to solving this issue. Thus, the intervention will not be imposed from the top-down or take place in a vacuum, but will be grounded in real world community mobilization and an existing and constantly unfolding issue.

It is important to note here that in the context of this study, the PHA Campaign is assumed to be representative of "the community." In reality, the PHA space involves a diverse community of large commercial farmers, small-scale farmers, activists, informal settlement residents and residents in the surrounding suburbs. As such, there will be a diversity of interests and perspectives within this group. Due to the time constraints of this dissertation, it was not possible to be fully representative of the PHA community. However, the PHA Campaign is actively advocating for their ethics and principles in the area, as will be discussed in Chapter 3, and so there is a strong possibility that community buy-in for the 'living urban edge' concept can be established through the PHA Campaign's rapport within the community. Additionally, the PHA Campaign is constantly consulting with the broader PHA community, and thus the group has the capacity to be representative to some extent.

ii) Participatory Action Research (PAR)

As described in the previous sections, this dissertation hopes to explore alternative, community-led means of protecting the PHA in light of the failures of the state to provide certainty regarding the protection of the area as open space and farmland in the long-term. As previously mentioned, the PHA Campaign is in the process of developing an idea, known as the 'living urban edge', which aims to draw on community mobilization to defend the PHA. Since this concept is inspired by the local community and depends on their buy-in, it is essential that its spatial planning outcomes are led from the bottom-up so as to foster agency, and draw on local, place-based knowledge. Underlying this approach is the assumption that "...effective social change depends on the commitment and understanding of those involved in the change process" (Allen, 2016). Community involvement in safeguarding open space subject to development pressure is also essential since often the root cause of ecological degradation is power abuse which is enabled by the concentration of environmental management responsibility within one individual or group (Keen, Brown & Dyball, 2005:4). In the case of the PHA, the CoCT's authority over the land has resulted in top-down planning decisions that predominantly favour the interests and agendas of city officials and developers, as previously mentioned. Thus, this dissertation is based on the belief that partnerships are essential in solving complex planning issues, and that local knowledge must be drawn on to inspire effective interventions.

It is for this reason that Participatory Action Research (PAR) will be utilized as one of the primary research methods. According to Winkler (2013:217), PAR involves mutually-beneficial collaborations between researchers and communities "...in projects that are intended to effect positive change." Engagement with a local community through co-producing knowledge and intervention precipitates "experiential learning" which can create solutions that are more responsive to context and complexity (Winkler, 2013:215). The appeal of this kind of learning is that it allows the research to move beyond merely conceptual understanding and towards a more "operational understanding" that aims to inspire action (ibid). As such, this enables

research that responds directly to a planning issue on the ground, and facilitates the process of imagining solutions from the perspective of those who are directly affected by the issue. This action-oriented approach is crucial given the vulnerability and critical importance of the PHA, and the lack of a proactive plan for protecting it as described in Section 1.3.

Engaging in successful PAR, according to the literature, hinges on upholding certain values. Namely, the local community must be empowered in the process, and the power balance between the researcher and the community must be equal (Winkler, 2013:216). According to Winkler (2013:217), fostering empowerment through PAR involves “a critique of the present situation that is creating systemic inequalities...(and) provid(ing) alternative responses, actions, and outcomes to this critique through a gradual process of structural transformation and the empowerment of those who have been systematically disempowered.” The project aims to co-produce alternative means to protect the PHA in the context of a land use management system that favours those with economic and political power. The hope is that creating a planning framework to illustrate this alternative can empower the PHA community in a system that is failing them. However, it must be noted that this empowerment must be community-led. The researcher’s position is to assist the community in co-creating solutions (Winkler, 2013:218). Whilst the intention of this dissertation is to promote the inclusion and empowerment of community voices in planning solutions as equals, it must be noted that the scale and timeframe of this dissertation limits my ability to fully uphold the PAR values previously discussed. Since I am delivering this dissertation as an individual, with some input (see Section 1.5.2.2) from the PHA Campaign, the power balance is not equal, and the final product is not fully representative of the PHA Campaign. As such, the spatial concepts put forward in this dissertation are not fully co-owned or co-produced. However, this dissertation can form part of a broader process which is driven by and fully owned by the local community. The intention is to create a starting point for the ‘living urban edge’ idea to materialize over time from the bottom-up, and to gesture towards a more community-led planning process. I did this as far as possible given the time constraints of the dissertation.

According to Winkler (2013), researchers engaging in PAR and collaborative planning must be cautious that the partnership is beneficial for all stakeholders involved in the co-produced project, in order to avoid a breakdown of the partnership. WInkler (2013:217) notes that when partnerships fail, it is often due to unmet expectations. Thus, it is important to establish a mutual understanding of the goals and potential risks and rewards of the project at the outset (ibid). Addressing this challenge therefore hinges on constant transparent communication, especially regarding the limitations of the project. The community must ideally be involved in every step of the planning process, so that their objectives and needs are also met (ibid). The researcher must be aware of their positionality and be cognizant of power imbalances and cultural differences (ibid). It is also important that trust and mutual accountability are built between the researcher and the community (Winkler, 2013:216). This is a limitation of the PAR method, as building such a relationship is time consuming, and this dissertation journey only occurs over a short period of time. However, given that I have worked with the PHA Campaign over the 2020 December vacation, relationships and a mutual understanding and vision have already been established with my research partners.

iii) Discourse Analysis

To contextualize the issue at hand, the CoCT's current spatial plans and policies pertaining to the PHA, and the urban edge, will be assessed. Specifically, the City's current Municipal Spatial Development Framework (MSDF), the Cape Flats District Plan (which includes the PHA) and the CoCT and Western Cape urban edge policies will be analyzed. This will help to ascertain where there are shortfalls in the current approach and why development encroachment has persisted in the PHA despite protective spatial policies, and thus how best to intervene. This exercise can assist in establishing the positions and objectives of key stakeholders. This will help to craft more realistic and effective interventions by recognizing institutional and political constraints, and opportunities for mutually-beneficial outcomes and partnerships.

In order to analyze these documents, discourse analysis will be utilized as a method. Discourse analysis studies language and how narratives are framed, and the implications of this on the social and ecological context (Jacobs, 2002:40). This is a useful method for understanding how current policy and spatial plans are conceptualized, and how this impacts on the integrity of the PHA. In recognizing the underlying assumptions behind current approaches to managing the PHA, shortfalls can be identified and this can inform the conceptual underpinning of the proposed alternative spatial concept.

1.5.2.2. Techniques

i) Field Observations

Field observations, which involve visiting the site under study and observing will be undertaken around the PHA (Kawulich, 2005:2). Particularly, dynamics on the edge of the PHA, where urban encroachment is the most rampant, will be prioritized for observation. This will allow for a place-based and detailed understanding of the current opportunities and threats in the PHA, in order to inform interventions. Photographs and field notes will be taken to record observations. A limitation of this method lies in the size of the area under study, and the time constraint of a four-month dissertation period . As such, it may not be possible to visit enough sites along the edge of the PHA multiple times which is what would be required to fully understand the opportunities and constraints acting upon the area.

ii) Semi-Structured Interviews

Semi-structured interviews are more conversational discussions with participants which are guided by open-ended questions and pre-established prompts. This technique enables the researcher to access nuanced, personal information from participants which will allow for understanding the positions and aims of various stakeholders. This is essential for fully understanding the context of the proposed intervention, as previously mentioned. Additionally, threats to the PHA which may not be fully documented but are observed and experienced by the City's planners, residents and farmers can be identified.

Key stakeholders include City officials, spatial planners involved in the PHA space, decision-makers responsible for the management of the PHA and local farmers and residents on the edge of the PHA. As an 'outsider' in the PHA space, accessing all stakeholders for interviews may be difficult. In addition to this, the timeframe of this dissertation did not allow for the conduction of interviews with all stakeholders. As such, only two spatial planners working in the PHA space, referred to as Spatial Planners 1 and 2 were engaged with in the semi-structured interviews. However, as previously mentioned, the PHA Campaign is embedded in the local community, and thus the partnership with this group may allow the Campaign to facilitate contact with residents and farmers outside of the organization that would be otherwise difficult to access. This can facilitate further research and stakeholder engagement beyond this dissertation. City officials require application processes to be undertaken before they are interviewed, which has proven to be time consuming. Thus, City officials will not be interviewed, but the critical discourse analysis will be used to ascertain the City's position.

A limitation of one-on-one interviews is that the quality of the data collected is entirely dependent on the confidence and know-how of the researcher. In order to undertake successful interviews, the way that questions are asked is crucial. Open-ended questions will be utilized so that the interviewee can guide the process, and participants must be probed and encouraged to elaborate as far as possible on their opinion (Roulston, deMarrais & Lewis, 2003:661). Open-ended questions, as opposed to closed questions, tend to reveal information that the interviewer didn't think to ask about, thereby allowing for more organic revelation of information so that the conversation isn't framed by the interviewer's personal bias. Therefore, the interviewer should limit their contribution to the conversation, allowing participants to represent their narrative on their own terms. Additionally, questions should be succinct and focused, and crafted with the research question and aim in mind. This responds to a common limitation of semi-structured interviews, where the flexibility of the interview style can result in a loss of focus and relevance to the dissertation topic (Roulston et al, 2003:648).

Due to the ongoing COVID-19 pandemic, interviews will need to take place online, either through video call where possible, or via voice call. This presents a limitation since this form of engagement is often less organic and comfortable. This is a limitation of undertaking research in the COVID-19 pandemic.

iii) Focus Groups

Focus group sessions will be utilized as a technique to support the co-production of the 'living urban edge' concept in partnership with the PHA Campaign. As opposed to one-on-one interviews, this technique allows for a dynamic discussion between those involved in contributing to the intervention. As such, focus groups enable the participatory approach that is fundamental to my research (Nared & Bole, 2020:207). The aim is for focus group discussions between myself and the PHA Campaign to take place in various stages of the research process, in order to fulfill the requirements of a successful PAR project, as previously discussed. Specifically, focus groups will be undertaken at the outset of the project to establish common aims, visions and principles, and define the problem that the 'living urban edge' concept is responding to (Focus Group 1). Following this, a focus group will be undertaken to

collaboratively explore the 'living urban edge' concept (Focus Group 2). Again, it would be ideal to have more focus groups throughout the project so that the PHA Campaign's ideas could be fully represented. However, the timeframe of this dissertation did not allow for that. It is important to note, however, that these focus groups build on notes taken from extensive discussions over my period of vacation work with the PHA Campaign in 2020.

1.5.3. Ethical Considerations

An ethical approach where research involves human participants requires that informed consent is provided by all participants (Anthropology Southern Africa, 2005:142). To this end, consent forms will be provided to all participants a template of which is attached as Appendix B. All participants must be informed of the aims of the research and must be given the option to remain anonymous or opt out at any stage of the process (ibid). It is important to always be aware of any possible ethical issues, and to use information thoughtfully and responsibly. This involves never betraying confidentiality or misrepresenting or misquoting participants' viewpoints. Ethical approval was obtained for this dissertation from the University of Cape Town (UCT) Faculty of Engineering and the Built Environment (EBE). The approval is attached to this dissertation as Appendix A.

As previously discussed, a major issue with PAR is that often the expectations of the research partners are unmet. Thus, it must be made very clear at the outset of the project that its outcomes will be limited by time and resource constraints. Particularly, it must be very clear that this dissertation is seen as a step in a much broader and longer-term process to fully realize the PHA Campaign's vision for the area. Again, an ethical approach in this regard hinges on clear and transparent communication with the research partners.

Finally, since this project takes a critical stance of the current approach to urban growth management at the outset, and due to the PHA Campaign's position as activists in resistance against this current approach, bias is of concern in this dissertation. However, multiple research methods and techniques have been used in order to offset this concern through research triangulation. According to Noble & Heale (2019), triangulation of research findings involves "...combining theories, methods or observers in a research study, (which) can help ensure that fundamental biases arising from the use of a single method or a single observer are overcome".

1.6: Limitations

The following Section will briefly summarize the limitations of this dissertation process discussed throughout this Chapter. The first major limitation pertains to the dissertation timeframe, which does not allow for a fully co-produced and co-owned PAR outcome. According to Ruiz-Mallén (2020:1), ideally in PAR research, "...researchers are facilitators of the participatory process rather than intellectual leaders of the research." Whilst supporting this approach to research is the intention of this dissertation, due to the limited time period for research processes it is not possible for the power balance in this project to be truly equal. This is because, typically, a robust PAR process is incredibly time-consuming (2020:8). I will include the voices of my research partners to the best of my ability. However, since this is a project that I am mostly

producing through my own words, it is not possible to be truly representative. In addition to this, my research partners (the PHA Campaign) are assumed to be representative of the diverse PHA community for the purposes of this dissertation, which is invariably an oversimplification of the diverse perspectives present within this community. However, as has been mentioned previously, the intention is to make a modest gesture towards more inclusive and community-owned planning solutions within the constraints of this dissertation period.

1.7: Dissertation Structure

The dissertation structure is indicated on Figure 3 overleaf. The dissertation will unpack the research questions and respond to the research aim within the following Chapters:

Chapter 2: This Chapter will review the relevant international literature pertaining to the current approach to urban growth management, with a focus on the urban edge tool. In addition to this, dynamics at the urban-rural interface will be explored. Finally, the regenerative or 'living' development and bottom-up planning paradigms which this dissertation aims to support will be investigated, in contrast to the modernist and sustainable development paradigms underlying the urban edge tool.

Chapter 3: This Chapter will contextualize and unpack the PHA case study. The socio-ecological context of Cape Town, and its policies pertaining to urban growth management, will be critically analyzed. Following this, the spatial dynamics, opportunities and tensions at the PHA edge will be introduced.

Chapter 4: Once the opportunities and threats facing the PHA edge have been contextualized in Chapter 3, Chapter 4 will put forward the 'living urban edge' concept in response. This will be informed by the theories of regenerative and bottom-up development explored in Chapter 2, as well as relevant international precedents pertaining to proactive design at the urban-rural interface. Finally, a vision, spatial concept and design principles will be put forward for the proactive development of a 'living urban edge' for the PHA. These concepts will be spatially expressed and pioneered in a 'pilot' edge of the PHA, the Schaapkraal urban edge (western edge).

Chapter 5: This Chapter will put forward a proposal for how the intervention put forward in Chapter 4 can be implemented.

Chapter 6: This Chapter will reflect on the research journey, the findings and lessons learnt throughout the process, as well as recommendations for future research.

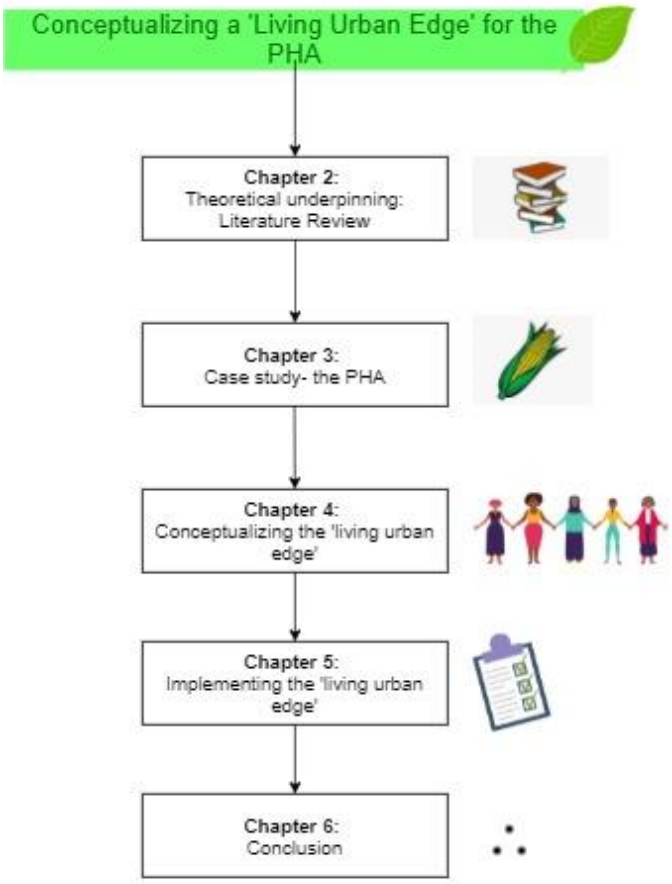

Figure 3: diagram indicating the dissertation structure. Author's own.

Chapter 2: Theorizing the 'living urban edge'

2.1: Introduction

This Chapter will attempt to ground the proposed 'living urban edge' concept to be put forward in Chapter 4 in the relevant literature. This can assist in establishing a theoretical and conceptual foundation for the concept. As discussed in Chapter 1, the proposed concept has emerged in response to the shortcomings of the current approach to managing urban development encroachment, with a focus on the urban edge. It is evident that the current approach is not fully working since globally, development encroachment on open space has remained a critical and persistent issue (Horn, 2009; McWilliam et al, 2012; Simon, 2008:176). In this Chapter, the reasons behind this will be investigated through a review of the international literature on the urban edge planning tool, the urban-rural interface and the issue of urban development encroachment. This will take place at length in Section 2.3. However, since the focus in this dissertation on the proposed alternative to the urban edge is conceptual in nature, it also becomes necessary to problematize the conceptual underpinnings of the current approach to urban development control. As such, Section 2.2 will explore the concepts and narratives behind the urban edge, and propose an alternative: regenerative, bottom-up development and planning. Finally, Section 2.4 will explore how regenerative principles can inform alternative, bottom-up approaches to safeguarding open space from urban development encroachment.

2.2: Towards Regenerative Cities

"We live in two interpenetrating worlds. The first is the living world, which has been forged in an evolutionary crucible over a period of four billion years. The second is the world of roads and cities, farms and artifacts that people have been designing for themselves over the last few millennia. The condition that threatens both worlds- unsustainability- results from a lack of integration between them"
(Cowan & van der Ryn, 1996:18)

Cities in their current form are in crisis. The existential threat of climate change combined with the interrelated issues of water scarcity, food insecurity, natural disasters and socio-economic inequality are testament to the current imbalance of humanity's relationship to the natural world (Baxter et al, 2019:4). Girardet (2015:26) terms the modern city the 'Petropolis' due to reliance on globally traded fossil fuels and private automobiles. The result of this carbon-heavy, car-oriented urbanism is a sprawling[12] urban form, which tends to displace valuable agricultural and conservation land further from the city, and transform it from open space into cityscape (Thomson & Newman, 2020:1507; Girardet, 2015:29). According to Alexander (1977), "Continuous sprawling urbanisation destroys life, and makes cities unbearable." This phenomenon is being observed globally, and is being exacerbated by rapid urbanisation and the

[12] Urban sprawl refers to the rapid expansion of the size of the urban footprint, leading to the transformation of agricultural land and open space into urban space

resultant burgeoning demand for land (Roös, 2021:17). This has created a sense of profound uncertainty regarding the future of the world's cities (Ruiz-Mallén, 2020:1). The frontlines of this battle between all-consuming urban sprawl and remaining open space is the urban edge, where the city meets open landscape, as indicated in Figure 4.

Figure 4: Urban sprawl in North Virginia, the United States of America. The boundary between residential space and open space is poorly defined, allowing for the incremental expansion of the city, with destructive cumulative impacts on the availability of green space[13].

As argued by Thomson and Newman (2020:1505), the biggest barrier against urban transformation in response to these challenges facing modern cities lies in cultural norms and assumptions. Today's cities were largely molded under modernist principles[14] of city design, which attempt to separate the city from nature in pursuit of ordered, 'rational' and technologically advanced urbanity (Hemenway, 2015:9). This approach is rooted in Enlightenment thinking, which saw "...nature and the universe as a machine that could be dissected, rebuilt, and controlled" (Hemenway, 2015:9). Beyond this, the idea of socio-natural separation perceived the human relationship to the environment as a hierarchy, with 'rational' and 'advanced' human societies at the pinnacle (Kerstein & Katsis, 2017). This created a fragmentary approach to spatial design, which was imported to the Global South as a central part of the colonial project. As expressed by Barnett (2021), under colonialism "Entire landscapes were re-ordered to fragment, disorient and ultimately destroy the social ecologies of the peoples who inhabited

[13] Source: Unknown.(Image). *Urban Sprawl.* n.d. Available: https://environmentandresourcemanagement.weebly.com/blog/urban-sprawl [2021, October 18].
[14] Modernism is an architectural and city design movement which emerged in the early 20th century in response to the ecological and social inefficiencies of the 19th century industrial city (Braga, 2013).

them." As previously mentioned, as the world's cities grow, nature is displaced and driven further away, hence perpetuating this separation (Ma, 2016). In addition to this, designing urban environments characterized by order, control and separation has created modern cities which are sterile, rigid, deadened and lacking in vibrancy (Hemenway, 2015:9).

Figure 5: a traditional walled town in 1500s Germany, indicating the historical separation of the urban and the natural[15]*.*

Thus, there is great need for radical new approaches to urban planning, and especially in the way that people and cities relate to the environment spatially. As articulated by Thomson and Newman (2020:1502), whilst the current ecological crisis threatens the functioning and stability of cities in their current form, this destabilizing moment also opens up an opportunity for exploring new ways of thinking and transformative approaches to city planning and design. According to Girardet (2015:9), it is within cities where new concepts can emerge, as human creativity and imagination is most concentrated and vibrant within the urban world. The energy and fresh ideas of urban communities should thus be celebrated and enhanced in imagining these new approaches. Beyond this, given that cities harbour most of the world's population,

[15] Image Source: Braun and Hogenberg (1560), cited in Girardet (2015:17).

they are critical leverage points to shift cultural trends and narratives (Hemenway, 2015:2). Radical new planning ideas such as the 'living urban edge' arguably cannot occur without a systemic paradigm shift in terms of how the relationship between cities and nature is conceived. Without a change in our way of thinking, the uptake of novel ideas which challenge this way of thinking will be stunted. As such, it is necessary to explore the underlying narratives which drive decision-making.

The purpose of this Section is to ground the 'living urban edge' concept in current debates regarding the future development of cities in a context of global climate change and socio-economic inequality, and especially with reference to the perpetual displacement of green space from cities. Since the 'living urban edge' concept responds to a human-environment conflict (namely development encroachment), there is a need to explore the narratives which mediate the socio-ecological relationship. Specifically, ideas of development drive planning and decision-making in terms of this relationship and thus must be further unpacked.

Theoretically, the 'living urban edge' concept is pushing in a different direction to the mainstream urban edge planning tool, which epitomizes the modernist and sustainable development (see Section 2.2.1) approach in its attempt to separate the urban from the natural with a rigid 'line'. On the other hand, as introduced in Chapter 1, the 'living urban edge' concept is grounded in theories of regenerative development and bottom-up conservation, both of which aim to resist harsh boundaries between people and the environment. This Section will begin by problematizing the ideals underlying the mainstream urban edge planning tool in Section 2.2.1. Section 2.2.2 will introduce how theories of regenerative development are emerging in opposition to conventional sustainable development and modernist narratives. This alternative theory is used to ground the concept detailed in Chapter 4 in relevant literature and works towards establishing a conceptual foundation for the 'living urban edge' concept.

2.2.1: 'Sustainable development'- entrenching separation

The prevailing concept which guides environmental planning and decision-making globally is the idea of sustainable development. Traditionally, sustainable development is defined as a decision-making approach where the priority is to address the needs of all people equally without compromising the needs of future generations by destroying the ecological systems on which we depend (Pieterse, 2011:310). This idea is based on the narrative of the Anthropocene, which as discussed in Chapter 1 assumes that humanity is a destructive force acting upon nature. As such, socio-economic development and ecological prosperity are seen as mutually exclusive outcomes, as indicated on Figure 6. Thus, the goal under the sustainable development framework is merely to minimize the assumed unavoidable harm on the environment which arises from the pursuit of human development (Roös, 2021:1). As articulated by Roös (2021:1), "Ultimately, this practice is only resulting in a mitigation approach that is just slowing down the degradation of our living earth."

Figure 6: Diagram depicting the sustainable development concept[16] *. Clearly, people and the environment are seen as separate.*

Figure 6 indicates the conceptual separation between people and the environment at the root of the sustainable development narrative. Since humans are seen as a destructive force acting upon nature, the simultaneous attainment of socio-economic development and ecological conservation is seen as a 'zero sum game' of constant trade-offs. Thus, as articulated by Katzschner (2013:210), "the objective of much environmental action is not to embed human society more deeply in heterogenous or hybrid relations; instead it seeks to diminish the impact of this society on natural entities by protecting nature from human interference." This binary approach extends to decision-making processes and institutions, where matters of natural and social sciences are addressed in isolation due to the prevalence of siloization[17] (Dixon & Ramutsindela, 2006:130).

When top-down[18] decisions are framed as trade-offs between socio-economic growth and development and environmental protection, often environmental concerns are sidelined due to political interests and agendas (King, 2009). Additionally, the convention within environmental decision-making and planning is to view a project in isolation from its broader context and cumulative impact. With this approach, seemingly insignificant amendments to environmental regulations or concessions allowing for environmental degradation are easily motivated for if the

[16] Source: Premaratne, Y. 2018. *Managing the triple bottom line: path to a sustainable future.* [Image]. Retrieved from: https://medium.com/@sammani.premaratne/managing-the-triple-bottom-line-path-to-a-sustainable-future-3308e577b959

[17] Siloization refers to the separation of different disciplines with poor communication and cooperation between them.

[18] Top-down planning is here defined as an authority-led development approach (Urboteca, 2018).

development is bringing in economic growth or jobs. In a neoliberal[19] global macroeconomic context, often the jobs provided are short-lived and do not provide substantive livelihoods, and the economic growth does not 'trickle-down' to the poor. As such, King (2009:6) likens this form of decision-making to a 'death by a thousand cuts' for the earth and its inhabitants. As a result, critics of the sustainable development narrative have termed it an "empty signifier", in that its vague construction has rendered it malleable to interest groups with economic and political power (Brown, 2016:115). The inevitable prioritization of economic growth when trade-off decisions are made from the top-down by those with political and economic power has led critics to argue that in actual fact, sustainable development has come to represent the 'pig headed model', indicated in Figure 7.

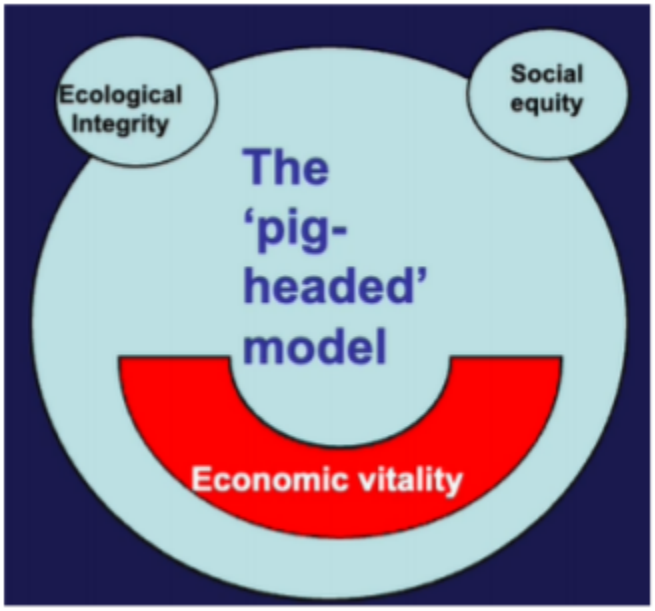

Figure 7: the 'pig headed' model of development, where economic growth is privileged at the expense of social and environmental prosperity[20].

Thus, according to Harper (2017), "sustainability in urban planning acts as a foil to give the appearance of doing something...about the environment, when in effect it is largely deployed to maintain the priority of economic growth for achievement of global competitiveness''. This is worsened when decisions are made from the top-down. As articulated by Girardet (2015:97), the term has become riddled with complexity due to its many interpretations by different interest groups. In this, he stresses, the term has become "a rubber band that can be stretched in many

[19] Neoliberalism is an economic ideology which argues for a free market economy with minimal government intervention. The belief is that economic growth will "trickle-down" to the poor and ameliorate inequality (Monbiot, 2016).

[20] Image Source: Norman, B., Capon, A., Kubiszewski, I. & Steffen, W. 2016. (Image). Times demand a Sustainable Development Commission to replace the Productivity Commission. *The Conversation.* March 25. Available: https://www.researchgate.net/publication/304464063_Times_demand_a_Sustainable_Development_Commission_to_replace_the_Productivity_Commission [2021, November 08].

directions." The impacts of this decision-making framework on the effectiveness of the urban edge planning tool will be addressed at length in Section 2.3.

2.2.2: 'Regenerative development'- towards synergistic relationships

Theories of regenerative development have emerged in response to the shortcomings of the prevailing sustainable development narrative outlined in Section 2.2.1. At its core, regenerative development aims to challenge the conceptual separation of society and nature, and hence the trade-off approach of sustainable development. Instead, regenerative development recognizes that humans and the natural world are deeply 'entangled'[21] and thus exist in relationship with one another (Hamilton, 2017:579). This approach is inspired by complexity studies, which recognizes that the city and its inhabitants are part of an interconnected 'whole', which is the living earth in its entirety (Roös, 2021:22). Another key idea underlying the regenerative development paradigm is the notion of 'biophilia'[22], which states that humans have an innate and deep connection to nature which is essential for our mental and physical health and wellbeing (Roös, 2021:78). This was articulated by Alexander (1977), who claimed that it is a 'biological necessity' for people to have contact with nature. In addition to this, the regenerative development paradigm takes issue with the passivity and reactivity of the sustainable development approach, which merely attempts to minimize the adverse impacts of human activities. Instead, it is argued that city planning decisions should proactively seek to improve and restore the socio-ecological relationship to ensure the long-term resilience and health of our living environments. In recognizing the entanglement of humanity's wellbeing with the environment, it becomes clear that any harm done to the planet is ultimately inflicted upon ourselves, and thus the 'harm minimization' and trade-off approach of sustainable development is no longer tenable. In this, the key idea of regenerative development is that human activities should seek to restore and create a net positive impact on the environment, as indicated in Figure 8.

[21] The notion of entanglement moves away from nature-society polarity and instead supports the view that all beings are interconnected through the 'web of life' (Hamilton, 2017:582).
[22] This idea was put forward by E.O. Wilson (1986) in the *Biophilia Hypothesis* (quoted in Röos, 2021:78). He roots our innate connection to nature in the fact that we have co-evolved with it over a long period of time.

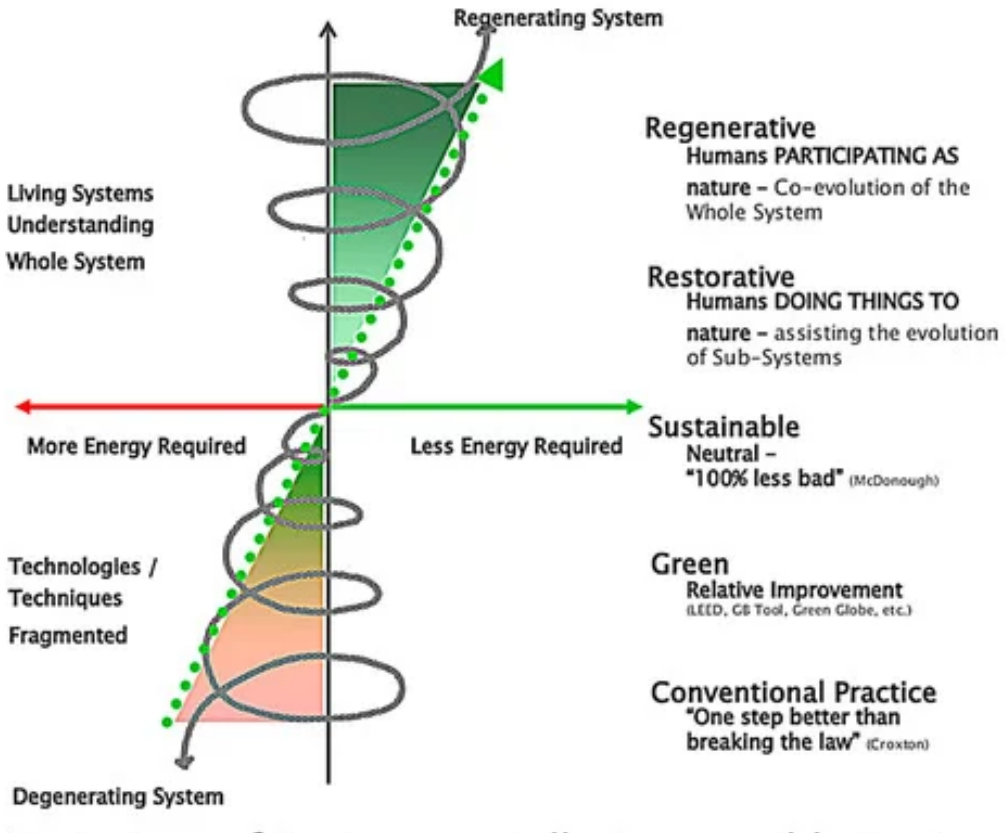

Figure 8: conceptual illustration of regenerative development. Clearly, this paradigm moves beyond the neutral grounds of sustainable development[23].

According to Girardet (2015:2), applying the idea of regenerative development to city planning and design can lead to cities which have an "environmentally enhancing, restorative relationship" with the natural systems they depend on. This can lead to the imagining of 'win-win' situations which ameliorate both socio-economic inequality and ecological degradation (Chappell et al, 2013:3). Thus, in recognizing the interdependence between human and ecological flourishing, regenerative urban transitions require urban systems which simultaneously promote the restoration of the environment in tandem with improving livability (Thomson & Newman, 2020:1506).

Incorporating a regenerative worldview and ethic into city design can result in places which are more organic, self-organizing and spontaneous. This can respond to the 'deadening' effects of the rigidly planned modernist city as discussed in Section 2.2.. According to Roös, designing regenerative cities requires integrating people and the built form into the environment (Roös, 2021:11). A central tenet of regenerative design is thus working with *the whole*, which entails a holistic and integrative systems-thinking approach (Roös, 2021). According to Roös (2021:113),

[23] Source: Venter, A., Marais, L. & Morgan, H. 2019. (Image). Informal Settlement Upgrading in South Africa: A Preliminary Regenerative Perspective. *Sustainability.* 11(9).

“Wholeness thinking recognizes that the entirety is interconnected, and moves us beyond mechanics into a world activated by complex interrelationships.” This can result in an urban environment which embodies Christopher Alexander’s notion of ‘aliveness’[24] (Alexander, 1979; referenced in Roös, 2021:11). Urban structures and systems which integrate nature and society are termed by regenerative designers as ‘living structures’, as discussed in Chapter 1. Cities which cultivate and enhance ‘aliveness’ are by nature more resilient and adaptive, due to the ability of communities and nature to self-organize (Hemenway, 2015:10).

Thus, in resisting the separation of the urban and the natural, a crucial priority of regenerative or ‘living’ design is the safeguarding and maximization of open space *within* and in proximity to cities, which is the focus of this dissertation[25] (Thomson & Newman, 2020:1509). According to Ma (2016), integrating natural space into the city can help connect people to the environment, and hence enhance willingness to safeguard nature. Beyond the conceptual and ethical value in working against separation, various essential ecosystem services[26] are provided by green space within urban environments. Pockets of open space in the city increase permeability and hence the ability of rainwater to restore groundwater sources, which is essential given rising water insecurity due to changing rainfall patterns (Deelstra, 1987:2). Additionally, as the world’s major metropoles expand and grow, high rise buildings and impermeable tarmac surfaces trap heat, causing the urban heat island effect (Kings, 2016). If the liveability of cities is to be ensured in the long-term, especially given rising global temperatures, green space needs to be proactively safeguarded and enhanced to provide cooling and carbon sequestration (ibid; Girardet, 2015:118). Additionally, as Section 2.2.3 will discuss, incorporating food-producing green space within cities can aid food security, nutrition and health. The ongoing COVID-19 pandemic has reiterated the importance of open space in the city for public physical and mental health and wellbeing as was initially suggested by the notion of ‘biophilia’ (Nieuwenhuijsen, 2020; Ma, 2016; Roös, 2021:79). Beyond providing benefits to society, green space in cities expands the habitat available for the world’s threatened biodiversity (Nieuwenhuijsen, 2020).

2.2.3: Urban agriculture- a key component of regenerative development

“...urban gardening has the potential to ‘change people and places’ and people’s relationships with the spaces in which they live...(urban agriculture has) the potential to connect people to each other and to connect people and places” (Battersby & Marshak, 2014).

This subsection will focus on urban agricultural space and how its preservation is critical for realizing the regenerative city vision outlined in the previous subsection. This is necessary

[24] Alexander (1979) in *The Timeless Way of Building* states that if urban environments are designed in an integrated way, the resulting structures will be ‘alive.’ This is to say that structures and places will embody a sense of wholeness and vibrancy (Roös, 2021:11).
[25] It is important to note here that this dissertation focuses on one aspect of regenerative city design, namely the protection and integration of open space in the city. However, there are many other central aspects of regenerative city design, such as promoting green infrastructure and circular systems.
[26] Ecosystem services are the benefits that nature provides to human well-being (National Wildlife Federation, n.d).

because the case study in Chapter 3 focuses on agricultural land (as a subcategory of "green space"). However, it is important to note that the hope is that the concept put forward in Chapter 4 will be applicable to other forms of open space. In addition to this, urban agricultural land is focused on due to the opportunities that urban food growing initiatives offer for better connecting people to the environment, and creating mutually beneficial interventions. As such, as will be discussed at length in this subsection, urban agriculture is a critical leverage point for spearheading regenerative transitions. In addition to this, agricultural land is currently one of the most destructive land uses on natural systems, and thus is an area in critical need of regenerative transformations. The globalized industrial agricultural sector has been pinpointed as one of the main global drivers of biodiversity loss[27], land degradation and water pollution[28] (Chappell et al, 2013:3). Thus, given that this dissertation focuses on the importance of preserving quality green space, this is a central source of tension that needs to be resolved. In a context of growing water scarcity and insecurity given global climate change, the agricultural sector is of particular concern given that it accounts for 70 percent of water use globally (World Bank, 2020). In addition to this, commercial farm labourers are among some of the most exploited workers in the global economy (ibid). Thus, this sector is in need of both ecological and socio-economic improvements, a transformation which regenerative development processes can facilitate due to its cross-cutting and integrative approach. Finally, as will be discussed in Section 2.3, agricultural land in proximity to cities is particularly under threat from urban development encroachment, more so than conservation land or public open space (Simon, 2008; Condon et al, 2018:105). This threatens the ecosystem services that localized food production provides (Skog, 2018). As such, this dissertation focuses on the safeguarding of agricultural space from urban encroachment. This subsection aims to further outline why agricultural land, and especially regeneratively farmed[29] land is critical for realizing the vision of regenerative future cities, outlined in the previous subsection.

According to Brown and Wakefield (2013), urban agricultural spaces are a significant element of cities' green infrastructure and as such provide multiple ecosystem services[30]. Local food production presents an opportunity for closed loop resource flows within the urban metabolism[31], for example through composting projects, using available local resources and reusing wastewater (Girardet, 2015:68; Battersby & Marshak, 2014; Olivier & Heinecken, 2017). Another significant ecological benefit provided by urban agriculture is the restoration of degraded land. Often, according to Olivier and Heinecken (2017:170), urban cultivators use derelict land such as illegal dumping sites and in so doing transform these neglected spaces

[27] By nature, monoculture farming practises replace diverse landscapes with a homogenized land cover (Chappell et al, 2013:5).
[28] Commercial agriculture's use of chemical pesticides and fertilizers degrades the soil and water (Chappell et al, 2013:5).
[29] Regenerative agriculture applies the principles of regenerative design to farming (Hemenway, 2015). This includes circular farming systems, utilizing organic inputs, farming a diversity of products and minimizing soil disturbance (ibid).
[30] These ecosystem services include stormwater retention and filtration, biodiversity habitat, psychological and aesthetic benefits, carbon sequestration and urban heat island effect mitigation (Brown & Wakefield, 2013).
[31] The term 'urban metabolism' refers to the "flows of energy and resources within cities, between cities and in the world beyond" (Girardet, 2015:68).

into thriving, lush green spaces. In addition to this, as will be discussed further in Section 2.3.3, the urban-rural interface offers the potential to better connect city dwellers to nature and the origins of their food, thus ameliorating the paradigm of separation discussed in Section 2.2.1 (Laband, Lockaby & Zipperer, 2012).

Kohsaka and Uchiyama (2021) discuss the impacts of the COVID-19 pandemic on relationships between people and the landscape, arguing that the pandemic has created a renewed sense of value among citizens for green space. The authors argue that this relationship is expressed especially at the urban-rural interface (ibid). According to Erling (2007; quoted in Simon, 2008:173), the urban-rural interface holds the most potential for positive change towards more sustainable futures due to the capacity in these spaces for 'multifunctional urban agriculture', which is a creative approach to growing food in a context of land use competition. This form of agriculture combines, for example, conservation and wildlife habitat with food-growing, or sustainable housing clusters with urban agriculture projects (ibid). Farms in proximity to urban space are generally smaller than in remote rural areas, since land prices are generally higher than production outcomes (Fertner et al, 2016:7). Small-scale farms require a diversity of crops to be productive, and thus there is significant opportunity for combining small-scale urban farms with indigenous flora conservation (Chappell et al, 2013:3). A result of this is an increased ability of small-scale farms to support local biodiversity[32] (ibid). In addition to this, farming diverse horticultural crops uses on average five times less land, and significantly less water, than meat farming (Girardet, 2015:111). Urban farms and regional food supply systems also reduce the carbon footprint attached to transporting produce within a globalized food system (Girardet, 2015:110). Finally, in a context of land use conflict and expanding urban populations, the availability of land for meeting human needs is of serious concern. Studies have found that regenerative agricultural transitions can increase the yield of food without expanding the amount of land needed for production (Chappell et al, 2013:7). Thus, according to Chappell et al (2013:5), "Inherent trade-offs between biodiversity conservation and farm productivity cannot be assumed."

In addition to providing benefits to the environment, regenerative urban agriculture holds the potential to significantly improve socio-economic wellbeing. This is essential for regenerative transitions which aim to simultaneously improve human and ecological prosperity. The Global South is suffering a nutrition crisis, which adversely affects the development and wellbeing of the urban poor (Deelstra, 1987:1). Localized small-scale farmers in the Global South provide affordable fresh produce to the poor through informal markets or through donating excess food to neighbors and relatives (Chappell et al, 2013:5). The lower transportation costs of locally produced food also makes fresh produce more affordable for the poor (Brown & Wakefield, 2013). Additionally, localized and decentralized food production ensures greater food sovereignty[33], which is essential given the disempowering effects of the globalized food economy (Demitz, 2015). The current COVID-19 pandemic has reiterated the vulnerability of the

[32] For example, according to Chappell et al (2013:5), a study conducted in Sweden found that small-scale organic farms supported 56% more bird species than large organic farms.
[33] According to Demitz (2015), "Food sovereignty is the right to choose what food to eat, where it comes from and how it is grown."

global economic system. As such, cities' reliance on importing food is becoming increasingly unviable (Pierce & Furuseth, 1982:555). Agricultural land in proximity to urban space also contributes a significant social and cultural value (Skog, 2018:2). Girardet (2015:115) describes how urban agriculture across the Global North and Global South is often rooted in historical practices and as such holds cultural value, whilst Condon et al (2018:106) and Battersby and Marshak (2014) speak of how community-led, small-scale food systems can strengthen the social fabric and build social capital[34]. According to Battersby and Marshak (2014), urban agriculture has been used globally as a form of resistance through asserting self-reliance, and thus urban gardens have become "important social centers". There is also a growing body of research into 'horticultural therapy', which explores how growing food creates a relationship between humans and plants and in so doing can improve one's sense of wellbeing (Battersby & Marshak, 2014). Additionally, scenic agricultural land can create quality recreational space and an aesthetic sense of place (Condon et al, 2018:108; Skog, 2018:2; Alexander, 1977). Given the fact that the globalized food system has severed people from being in relationship with their food, enhancing the visibility of food production within cities can serve to restore this relationship, and more broadly can restore connections between humans and ecology (ibid). This can cultivate more conscious consumerism and more personal and human economic relationships, as consumers can see where their food is coming from and who is growing it (Eisenstein, 2011).

Thus, through providing benefits to both people and nature, regenerative agriculture epitomizes the notion of entangled and mutually flourishing socio-ecological systems at the core of the regenerative development paradigm (Chappell et al, 2013:7). In this, the urban agricultural space offers significant potential for exploring and implementing regenerative development principles. This opportunity can aid in the reconciliation of conflict between urban development and rural preservation.

2.3: Urban Development Controls for Regenerative Cities? A Critical Analysis

Section 2.2 explored the motivations behind proactively pursuing regenerative development transitions within cities. A critical element of this involves safeguarding and promoting green space, and especially food-producing space, within and in proximity to cities. Due to the centrality of the planning profession in determining how land is used and how space is organized, the role of the planner is essential in ensuring regenerative transitions. This Section aims to critically explore the current approach taken by planners in safeguarding green space from urban encroachment, and in so doing where the current approach can be improved will be revealed.

[34] Social capital is here defined as the trust, networks and collaboration that can be built through strong human relationships (Bayat, n.d). Social capital allows for the creation of mutually beneficial outcomes within communities (ibid).

2.3.1: Historical overview and context

Historically, spatial planning laws and regulations emerged from the ecological imbalance and social decay which resulted from the rapid, unplanned urbanization of the 19th century Industrial Revolution period in the Global North (Alterman, 2014:336). Thus, according to Horn (2019:959), “Urban growth management is a discourse born in an attempt to control the growing industrial city in the early twentieth century...” In the Global South, this top-down masterplanning approach was imported to the colonies as a part of the colonialism project to control and dominate both indigenous people and the environment (Horn, 2019:959). As a result, colonialism has played a significant role in shaping the urban form of cities in the Global South (ibid). According to Horn (2019:960), masterplanning is the “...conceptualization of a blueprint plan illustrating a particular vision of a ‘good’ city”. As such, this approach to planning involves imposing a subjective ideal of urban environments from the top-down. In order to achieve this, it was necessary to develop planning tools to control and manage urban development in line with the masterplan vision. This approach to planning has been termed modernism, as previously discussed. A central facet of the modernist paradigm is the separation of land uses into ‘zones’. The ‘zoned’ modernist approach reflects the values underlying conventional sustainable development narratives since at the core of modernist planning is the attempt to separate the urban from the natural to create ‘ordered’ urban environments where the assumed conflict between the urban and natural can be avoided (Hemenway, 2015:xi; Allen, 2003). This was partly to reserve designated open space areas due to the multiple public health crises which were triggered by the environmental degradation and imbalance of the industrial city (Wylie, 2016:21). In addition to this, as the Industrial Revolution progressed, rapid city expansion resulted in the displacement and destruction of productive agricultural land, leading to an urban nutrition crisis (Giradet, 2015:19).

The result was a proliferation of planning and legal tools which aimed to safeguard open, recreational and agricultural space[35] within and around cities (Berrisford, 2013). In the contemporary moment, in light of catastrophic global climate change and ecological and social collapse, the emergence of ideas around regenerative and resilient cities has resulted in renewed energy and attention for the importance of protecting green space within the urban fabric. Land use regulations and restrictions, known collectively as urban growth management tools which are imposed from the top-down[36] are currently the most widely used planning tools for safeguarding green space from urban development encroachment globally (Horn, 2019). In general, urban growth management tools are planning regulations enforced by the state which aim to restrict urban development away from critical natural and agricultural areas. The focus of this dissertation is the urban edge, which is a demarcated cadastral line beyond which urban growth is not permitted. The reason for this focus is because, as will be described shortly, the urban-rural interface which the urban edge delineates is the area of greatest tension between conservation and urban growth. In addition to this, the case study which will be investigated in

[35] For example, in 19th Century Britain, the Small Holdings and Allotments Act mandated local governments to provide allotments for citizens to practise urban agriculture (Girardet, 2015:19-20).
[36] Urban growth containment and spatial separation and organization requires order and control, and as such these modernist planning are epitomized by a top-down approach (Shane, 2015:46).

Chapter 3 relates specifically to the urban edge tool and as such deeper analysis of the literature around urban edge policies is necessary.

2.3.2: Introducing the urban edge

According to Sim, Sutherland and Scott (2016:37), the urban edge spatial construct emerged in the 19th Century Global North. In the Global South, development boundaries were employed by colonial master planners to segregate and control indigenous populations (Horn, 2019:963). In the Global North, the early iterations of the urban edge employed green belts[37] as a means for containing urban growth, as reflected in Abercrombie's 1944 masterplan for London, indicated on Figure 9 (Sim, Sutherland & Scott, 2016:38). Greenbelts remain a common means towards spatially defining the urban edge in the present. According to Horn (2019:961), urban edges that have incorporated green belts have been more effective in containing development encroachment than those that have not[38].

[37] A green belt is a buffer area of green space, usually containing thick vegetation, which is utilized to create a clear spatial boundary in order to prevent urban sprawl (Xie, 2020).
[38] This is based on comparative studies between London, where a green belt has been used to enforce the urban edge, and cities such as Tokyo where no green belt has been employed in addition to an urban edge policy (Horn, 2019:961).

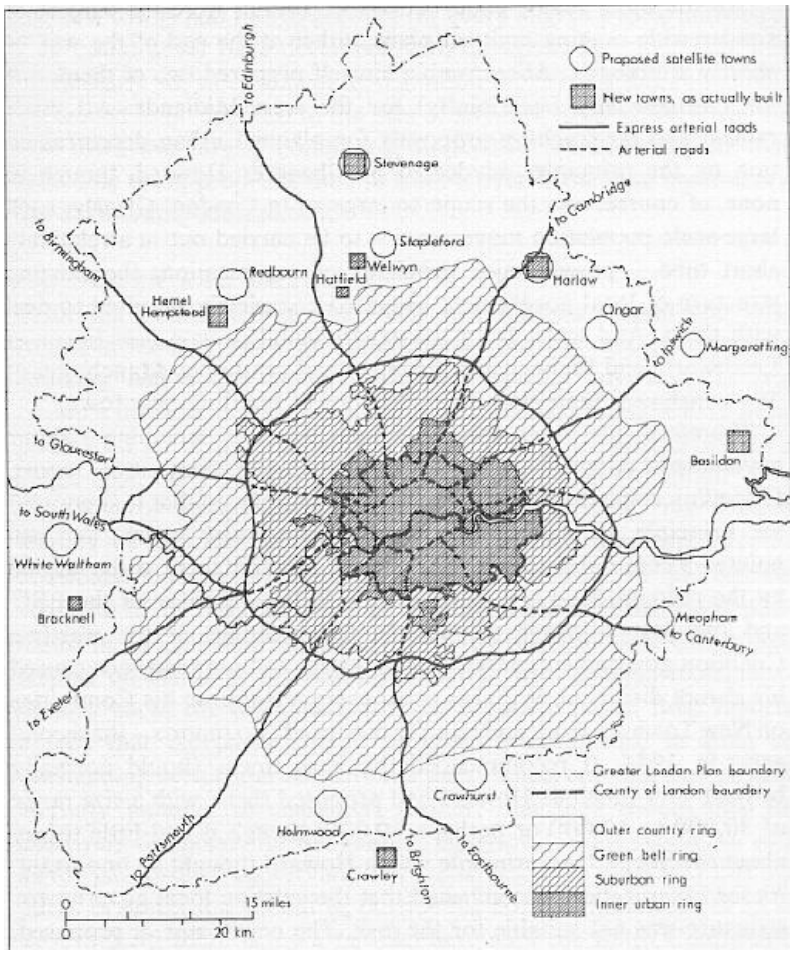

Figure 9: Abercrombie's 1944 Greater London masterplan, featuring a greenbelt to contain urban growth[39].

This planning tool is employed in a number of countries worldwide, including the United States of America (USA), the United Kingdom (UK), Australia, Copenhagen and South Africa (Horn, 2009:36). The urban edge tool is generally not fixed in perpetuity, and is delineated to accommodate expected urban growth for a defined period (DEAT, 2005). Once this defined period passes, the edge may be adjusted should the existing urban footprint not be able to accommodate further urban growth (ibid). The following subsection will further unpack the dynamics at the urban-rural interface, which the urban edge delineates.

2.3.3: Characterizing the urban-rural interface

As has been previously discussed, the urban-rural interface which the urban edge tool delineates is a site of both tension and dynamism. Douglas (2006; quoted in Rojas-Caldelas et

[39] Source: Laposi, R. 2014. (Image). The Challenges of the Lack of Sub-National Planning on City-Region Level: a Case Study of the Budapest Agglomeration. *The Metropolis.* DOI: 10.13140/RG.2.2.21024.58888

al, 2008) defines the rural-urban interface as "...transition zones or interaction zones, where urban and rural activities are juxtaposed, and landscape features are subject to rapid modifications, induced by human activities." According to Allen (2003:137), the urban-rural interface is characterized by land speculation, informal and illegal urban activities and unpredictable urban encroachment. As such, "Small farmers, informal settlers, industrial entrepreneurs and urban middle-class commuters may all co-exist in the same territory, but with different and often competing interests, practices and perceptions" (ibid). This social heterogeneity inevitably leads to conflict and contestation over land use in this space. Beyond this, a lack of social cohesion and constant stakeholder fluctuation at the urban-rural interface results in difficulties in establishing permanent institutional arrangements which can manage this space in the long-term (ibid). This compounds the uncertainty at the urban edge. Rojas-Caldelas et al (2008:644) state that the urban-rural interface is usually a mosaic of conflicting land uses, and as such becomes a space of spatial ambiguity and confusion. This also leads to habitat fragmentation and the destruction of rural landscape character (ibid).

This heterogenous characteristic of the urban-rural interface therefore indicates that a dichotomous understanding of urban and rural space is inaccurate, especially at the edge of the city (Fanfani, 2020). As such, Parham (2019:110) writes that the urban edge is "...distinct in character rather than just in between the city and the countryside." However, spatial planners have engaged little with how this transition zone should be proactively planned for, beyond the abstract delineation of the urban edge (Parham, 2019; Govender & Mammon, 2020; Allen, 2003; Gallent et al, 2006). According to Gallent et al (2006:x), the urban-rural interface is "planning's last frontier" due to the minimal attention that the spatial planning and land use literature has paid to this space. As such, Gallent et al (2006:xvi) argue that past planning approaches have undermined the complex dynamics at the urban-rural interface by merely focusing on urban containment and urban-rural separation, without planning for the space inbetween the urban and the rural. This will be discussed further in Section 2.3.4.

However it is important to note that the urban-rural interface is not only a site of tension and conflict, but is also a space of immense possibility. Permaculture[40] design principles define the 'edge' or interface between two different ecosystems as a space of increased diversity and activity, as indicated on Figure 10. According to this idea, the edge is a complex and active environment since it consists of two overlapping ecosystems (Engels, 2015). Extending this idea to the rural-urban interface can explain the dynamic nature of this space.

[40] Permaculture is a design methodology which is similar conceptually to regenerative design. Permaculture focuses on creating symbiotic relationships and solutions inspired by natural systems (Barth, 2016).

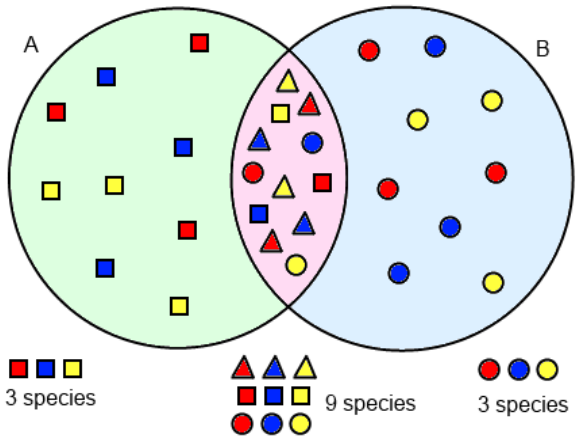

Figure 10: diagram explaining the edge effect. A and B represent two overlapping ecosystems with different species. The edge, where they meet, is more diverse[41].

In addition to this, as discussed in Section 2.2.3, the urban-rural interface offers an opportunity for more regenerative food systems which can serve to repair severed social ties, and human relationships to the ecological realm. The urban edge is a space where the activities of the traditionally dichotomized urban and rural spheres overlap, which offers the potential for better integrating cities with food-production and natural space (Gallent et al, 2006:11). Rojas-Caldelas et al (2008) contend that it is also a space that "offer(s) a bridge between the urban and the rural...(which) can be planned in order to establish health centers, education facilities, recycling and renewable energy production centers, productive landscapes, cultural or historical heritage, a space for the preservation of natural resources (and) spaces for recovery and regeneration.

2.3.4: Shortcomings of the current approach to urban growth management

Despite the implementation of urban growth management tools globally, encroachment of urban land uses on green space, especially at the interface, remains a prevalent issue (Horn, 2009; McWilliam et al, 2012; Simon, 2008:176). Gallent et al (2006:3) claim that car-dependency in modern cities, and the resultant sprawling urban form facilitated by freeway development has "...obliterate(d) any notion of a defendable edge." As such, these strategies of urban containment have had limited impact in mediating land use tensions (Battersby, 2016). Simon (2008:176) refers to this land use conflict as "...one of the most intractable environmental issues everywhere." According to Skog (2018) and Oberholtzer et al (2010), agricultural land is the type of open space most vulnerable to conversion to urban land use, and according to McWilliam et al (2012:754) and Condon et al (2018:106), this development pressure is especially pronounced at the boundary between urban and agricultural space. This was corroborated by Alexander et al (1977:27), who claimed that since the land which is most suitable for farming is also the most suitable for development, there is an inherent competition

[41] Deep Green Permaculture. (Image). *Permaculture Design Principle 10- Edge Effect.* Available: https://deepgreenpermaculture.com/permaculture/permaculture-design-principles/10-edge-effect/ [2021, August 27].

between urban and rural land use. The land market also plays a critical role in the constant degradation and diminishment of agricultural land. Agricultural plots are generally larger and cheaper than urban zoned plots and thus are often purchased by wealthy people and developers intending to construct large lifestyle properties (Simon, 2008:176; Condon et al, 2018:105). Speculators[42] often purchase and hold land which is protected by land use regulations with the expectation that these protections will eventually break down (Condon et al, 2018:106). According to Horn (2019:962) speculation is especially ubiquitous in the Global South due to weak governance and enforcement. Simon (2008:170) thus states that the urban-rural interface has become "...characterized by diffuse boundaries and weakened official planning controls", and according to Condon et al (2010:104), has become a "...zone of planning contention and land use conflict." As such, legal regulations such as the urban edge face serious limitations. The following subsections will unpack these shortcomings.

i) Conceptual issues: perpetuating separation

The urban edge, through attempting to define an abstract and abrupt 'line' separating the city from agricultural and natural space, epitomizes the conceptual society-nature polarity at the root of modernist urban planning and ideas of sustainable development. According to Horn (2009:9), due to the abstract nature of the urban edge, it has become 'just a line on a map' which can be easily overlooked and breached due to its lack of physical and spatial definition[43]. According to Laband, Lockaby and Zipperer (2012:xi), the urban-rural interface is shaped by a gradual transition from completely urban to completely rural land uses. Thus, the abrupt 'line' that the urban edge tool draws is inappropriate for the nature of space at the urban edge, as it does not account for the complexity of this transition space.

As articulated by Gallent et al (2006:3), the edge is subject to very little positive planning- it is "assumed but undefined." This dynamic is intensified in the Global South, where informal urban expansion at the periphery occurs outside of formal planning controls (Horn, 2019:961). According to Condon et al (2018:108), developers and residents see the urban edge as an impediment and frustration due to the fact that it is a fairly arbitrarily defined and placed 'hard edge'. Condon et al (2018:109) also claim that the simplistic and passive nature of the urban edge fails to proactively plan for sustainable and thriving urban food systems. Instead, a 'no go' line is merely drawn, with little guidance as to how the land beyond and within the urban boundary should be used or developed, or how the urban space can relate to the rural. As such, as previously mentioned, the urban-rural interface has become an ambiguous "non-place" where a lack of spatial definition and clarity allows for unbridled and often inappropriate or destructive development (Gallent et al, 2006:x). Thus, this tool, and other growth management regulations, epitomizes the passive 'harm minimization' approach of the sustainable development paradigm. According to Allen (2003), the artificial urban-rural dichotomy which the urban edge tool perpetuates is inadequate to deal with the complexity of this interface.

[42] Speculators are real estate developers who purchase property and hold it in the hope that its value will increase so it can be resold at a higher price (Cartier, 2021).
[43] This can perhaps explain why, as previously mentioned, cities which have spatially defined their urban edge with a green belt have been more successful in preventing urban sprawl and encroachment.

Additionally, as previously mentioned, rigid development control tools such as the urban edge contradict the self-organizing and adaptive nature of human and ecological systems. As such, this inflexible approach to spatial organization deprives cities of dynamism and spontaneity, creating a 'deadened' urban environment (Hemenway, 2015:10). This misses an opportunity to create vibrant and lively food-growing spaces at the urban-rural interface as outlined in Section 2.2.3.

As will be outlined in Chapter 4, this dissertation proposes a more proactive approach to urban growth management at the urban-rural interface. Globally, this idea is beginning to gain traction through the notion of agricultural urbanism or 'argrourbanism', where, according to Govender and Mammon (2020:121) "...urban development and productive landscapes begin to interface, so that citizens can not only be directly integrated with the environmental, social and economic means of production, but also benefit from the sense of place". According to Gottero (2019:4), agrourbanism is "...based on a new urban-rural balance, on the reconciliation of "rural-urban rift", on a new partnership between emerging forms of agriculture and new multidisciplinary approaches, a paradigm that can be interpreted as a new form of city but also as renewed rurality.``

II) Political tensions: top-down implementation issues

"The reality of planning often disappoints. In its operation and its outcomes, planning practice fails to live up to its promise. Into an ideal thought-world of planning policy and decision-making come political realities"
(Hillier, 2002:3)

Another core issue with the urban edge tool lies in top-down enforcement and implementation, which is laden with political complexity. The sentiment that the act of planning is inherently political has been widely documented within the literature (Hillier, 2002; Horn, 2020; Rose & Patel, 2016; Battersby, 2016; Horn, 2020:575). As a result of political complexities, often planning ideals and values fail to materialize in practise (Hillier, 2002:3). According to Battersby (2016), in order to understand this rift between intention and implementation, "...it is essential to understand the ways in which different forms of knowledge and associated power are employed by departments in local government with competing agendas." This sentiment is echoed by Hillier (2002:4), who urges that, "Local planning decisions...cannot be understood separately from the socially constructed, subjective territorial identities, meanings and values of the local people and the planners concerned." As articulated by Battersby (2016), local government is not a 'monolithic unit', and thus within the political sphere there is great complexity in terms of how decisions are reached and how 'value' is perceived and constructed. As such, planning decisions become a thorny and convoluted negotiation between competing interests and principles. Berg (2007:2, quoted in Battersby, 2016) identifies four main types of conflict which manifest in complex planning decisions: cognitive conflicts (which are based on technical disagreements), interest conflicts (where different actors stand to benefit from different policies or outcomes), value conflicts (which are based on conflicting morals) and authority conflicts (which are based on conflict around mandates and jurisdictions). This dynamic of conflict is

compounded in the environmental planning space, where decision-making is generally treated as a trade-off between environmental prosperity, economic growth and social justice as described in Section 2.2.1 (Battersby, 2016). Globally, top-down development control and growth management tools have proven to be riddled with political complexity and conflict, and have become deeply polarizing (Carter, 1976, Albrechts, 2003, Condon et al, 2018:108; Horn, 2020; Battersby, 2016). With rapid urbanization and hence demand for land, local planning officials face significant pressure to relax the provisions which are intended to safeguard open space (Carter, 1976:983; Condon et al, 2018:107). As articulated by Carter (1976:983), land use regulations and development controls tend to 'evade hard choices' by providing for open space whilst simultaneously incrementally yielding these protections to allow for urban development[44].

According to Thomson and Newman (2020:1506), "Conflicting agendas and short-termism[45]" are the major political barriers that have prevented cities worldwide from prioritizing the safeguarding of green space. The benefits and costs of protecting or failing to protect green space only tend to accrue and become visible in the long-term (King, 2009:3). This is not relevant for the short-term election cycles of politicians, and thus the more immediate benefits derived from social and economic development are prioritized to win votes and popular support. Additionally, the prevailing global neoliberal economic logic that guides decision-making has a role to play in the undercutting of environmental protections (Horn, 2020:575). Nonmarket benefits[46] associated with farms, wilderness and open space are not valued in traditional measures of development such as Gross Domestic Product (GDP), and thus are not considered in simplified, monetized cost-benefit analyses and trade-offs (Simon, 2008:174). According to Battersby (2016), certain 'ways of knowing'[47] are afforded more influence within the decision-making space. Particularly, Battersby (2016) contends that "The hard quantification of an engineer (or economist) often has a more powerful political voice than the appeal to intangible benefits of an environmental planner." Additionally, with the rise of neoliberalism as the prevailing global economic ideology there has been an increasing movement towards relaxing urban development controls in order to let market forces dictate city growth (Horn, 2019:962). This has seen a legitimization of entrenched power hierarchies and the exclusion of those without economic power in the decision-making and participatory process (Horn, 2020:576). This issue epitomizes conflicts of value and interest as defined by Berg (2007).

Another key political issue specific to the safeguarding of agricultural land lies in mandates, which falls under a conflict of authority as defined by Berg (2007). According to Condon et al (2018:112), municipalities have a critical role to play in ensuring and protecting human-scale,

[44] These comments were made with reference to development encroachment on open space in Dade County, the United States, in the 1970s. This indicates that the issues described in this section have persisted over time, and are globally relevant.
[45] 'Short-termism here refers to the tendency of political and industry stakeholders to prioritize short- to medium-term priorities due to short election cycles, public pressure and individual interests (Thomson & Newman, 2020:1506).
[46] For example, more qualitative benefits such as a sense of community and a sense of place.
[47] Battersby (2016) defines 'ways of knowing' in accordance with Schneider and Ingram's (2007) definition, which states that a 'way of knowing' is the narrative which frames how different actors interpret the problems and solutions at hand

localized urban food systems. However, the urban-rural divide often results in municipal planners and officials overlooking proactively planning for food production in the city, since rural planning is generally not a local government mandate (Brown & Wakefield, 2013). The dichotomous understanding of the urban and the rural within traditional planning approaches thus leads to institutional fragmentation, where the urban-rural interface, due to its inherent heterogeneity, does not fall neatly within either urban or rural governance structures (Allen, 2003:138). According to Cohen and Reynolds (2014:1), urban agriculture is often not seen to be the mandate of local municipalities and as such is treated with "benign neglect." In addition to this, enforcement of land use regulations is often weak, due to a lack of political will, human capital and or weak capacity (Battersby & Haysom, 212). As a result, development encroachment on open space also occurs through illegal and often ecologically destructive land uses such as waste dumping (ibid).

Finally, political tension is created when decision-makers pander to the demand of wealthy developers. As articulated by Chiweshe (2021:232), "Land in urban areas is both an economic and political asset, and involves multiple contestations, interests and agendas, mainly not in the interest of the poor urban dwellers." As such, according to Horn (2009:35), urban growth management regulations are often modified through pro-development deals between coalitions of public officials, powerful developers and foreign investors. According to Berrisford (2013), "Wealthy and powerful elites operate largely untroubled by planning laws...creat(ing) the perception that there are two laws: one for the well-to-do and another for the rest" (Conklin & Bryant, 1974:607; Kramer & Doran, 2009:349). According to Chiodelli and Moroni (2015), global surveys undertaken in 2013 by Transparency International have revealed that corruption is rife in the planning sphere, and particularly where land-use planning decision-making is concerned. In fact, a 2014 study by Transparency International found that the land use sector is the third most corrupt sector within government institutions globally (Chiweshe, 2021:223). Unfortunately, this creates a situation where land-use decisions will favour the developer with the deepest pockets. However, unlike in other areas such as public tendering processes, corrupt decision-making in the land use sphere is more indirect and hence much more difficult to track and identify (Alexander, 2020). According to Berrisford (in African Center for Cities, 2020), corruption in the land-use planning sphere is particularly prevalent in sub-Saharan Africa due to the booming real estate market where large profits can be gained from development. As previously mentioned, significant profits can especially be gleaned from converting rural land to urban use, hence making this area particularly vulnerable to vested interests (ibid; Alterman, 2014:330). Despite the efforts of activists, concerned planners and community groups in opposing inappropriate developments, often large corporate developers have the financial resources to engage in protracted litigation and development application processes. The result is that often the normative goals embedded within plans and policies such as the urban edge are not achieved in practise, since departure from the formally approved plan is frequent due to political and economic interests (Albrechts, 2003:250).

2.4: Imagining Alternatives: Bottom-up, 'Living' City Planning

"If this crisis of planetary climate disruption is to be navigated, it will be the efforts of thousands of communities–localized and dispersed–that will drive the creativity from which meaningful solutions will emerge"
(Davies, 2019:31)

The previous subsection indicated the shortcomings of the urban edge tool. Namely, conceptual issues lie in the fact that the urban edge perpetuates harsh boundaries between the urban and the natural, and the fact that the edge 'line' provides no positive or proactive guidelines for the complex and dynamic urban-rural interface. Regenerative principles (outlined in Section 2.2.2), in advocating for the embeddedness of people in the environment in positive and engaged relationships, responds to these conceptual shortcomings. Another core issue with the current approach for managing development encroachment on open space is the fact that top-down implementation often fails to uphold the intentions of the urban edge line in practise due to political complexity and power structures. This Section will provide an alternative approach to top-down implementation by introducing ideas of bottom-up enforcement and implementation. Given the systemic shifts required to enable regenerative development, and especially given the vested interests of politicians and global economic powers in the status quo (described in Section 2.2.3), community involvement in decision-making is becoming increasingly important (Girardet, 2015:98). According to Frantzeskaki et al (2018:282), this is because communities hold the capacity to alter societal values and "...pioneer and model new practices...eventually leading to incremental or radical changes in our practices and ways of organizing things." Additionally, the strong links between theories of bottom-up planning and regenerative development will be explored. This can set up the theoretical foundations for the 'living urban edge' concept as a response to the shortcomings of the urban edge planning tool.

2.4.1: Bottom-up planning theory

According to Horn (2019:961), bottom-up planning[48] emerged in response to the exclusionary and elitist nature of the modernist, top-down approach. Including citizens in planning processes aims to infuse decision-making with 'everyday' knowledge, which is more responsive to context than 'outsider', expert knowledge (Horn, 2020:575). According to Albrechts (2019:251), the "capacity to listen" in planning practice is essential for creating urban environments which respond to the needs of all citizens, as opposed to pandering to the interests of powerful elites. According to Tsing, Brosius and Zerner (2005:1), the involvement of communities in the conservation of natural resources is based on the premise that "...local populations have a greater interest in the sustainable use of resources than do the state or distant corporate managers." According to Simon (2008:181), the dynamic nature of the urban-rural interface especially requires more flexible planning mechanisms and institutions than is currently the case with top-down, rigid planning regulations. As discussed in subsection 2.2.2, people and the

[48] Bottom-up planning refers to citizen-led planning as opposed to authority-led, top-down planning (Gray, 2019).

environment have the capacity to self-organize and respond creatively and adaptively to complex challenges. Hence, ideas of bottom-up planning within the planning theory literature can offer responses to the challenges currently faced with the top-down implementation of the urban edge tool.

According to Watson (2014:2), since traditional planning theories emerged in the context of the Global North, exploring such alternative approaches to urban development is essential in a Southern context where dynamics such as weak public institutions, political instability, inequality and rapid urbanization create unique challenges. Civil society, according to Frantzeskaki et al (2018:288) responds to these challenges by providing social needs that the state and market fail to meet. According to Battersby and Marshak (2014), bottom-up urban processes "...hinge on the idea that communities have agency and do not have to wait for government or planners to intervene." However, community involvement in planning processes is not by nature antagonistic or oppositional to the state. The notion of co-production in planning, coined by the American political economist Elinor Ostrom in the 1970s, refers to the provision of public services through synergistic partnerships between the state and civil society (Watson, 2014:3). According to Frantzeskaki et al (2018:288), civil society organizations are important intermediaries between individuals in the local community and state actors and can help mediate mutually agreed upon solutions. According to Watson (2014:3), the state can benefit from accessing local knowledge, time and skills; whilst the state can support the community with resources and technical expertise.

Whether through activism in opposition to the state, or in organizing to co-produce with the state, community involvement in planning processes builds social capital (Watson, 2014:4). Social mobilization and support behind a cause tends to be far more enduring than political will, due to the issue of short-termism as previously discussed. In the case of safeguarding open space from development encroachment, drawing on community mobilization can better ensure long-term protection of the land due to the issues with top-down implementation as discussed in Section 2.3.4. Beyond this, participatory planning approaches can enable societal change and transformation of values and narratives (Beard, 2003:15). As previously discussed, it is only through radical social transformation of planning and design approaches that regenerative development can be realized. However, it must be noted that implementing such an alternative approach requires challenging entrenched top-down governance and planning structures (ibid).

2.4.2: Tying regenerative development and bottom-up planning together

"Sustainability transitions are about deep, radical change towards sustainability in ways of thinking, doing, and organizing, as well as in ways of knowing and relating"
(Frantzeskaki et al, 2018:282).

According to Girardet (2015:11), the regenerative development concept discussed in Section 2.2.2 focuses on cultivating symbiotic relationships between people and the ecosystems on which they rely. Regenerative urbanism involves not only greening the urban environment and

protecting nature from development expansion, but also the proactive involvement of communities in creating a net positive effect on the ecosystem (Girardet, 2015:2). As such, it follows that designing regenerative systems requires deep engagement with people, an approach that is enabled by the planning theory outlined previously. The discussion in Section 2.2.2 regarding regenerative development also argued that in order to create 'living' structures, communities need to be involved in placemaking and embedded in relationship with the landscape. This was emphasized by Alexander et al (1977:x) in the seminal *A Pattern Language,* who urged that "...towns and buildings will not be able to become alive, unless they are made by all the people in society." Additionally, regenerative design methodologies aim to incorporate local knowledge since it has grown and adapted organically in response to the specific environmental and social dynamics, assets and constraints of a place (Denison & Wotshela, 2009:2). Communities are by nature more adaptive and flexible, which enables a more sensitive approach to organizing urban space than the more rigid and comprehensive modernist approach (Frantzeskaki et al, 2018:285).

According to Davies (2019:30), the cornerstone of nature's resilience[49] lies in its diverse communities of self-organizing and adaptive organisms. Thus, in designing cities inspired by nature, supporting and empowering communities becomes essential. As previously mentioned, the will of a mobilized community to protect the environment is far more resilient in the long-term than the often short-sighted and self-interested motivations of powerful decision-makers. In nature, each important ecological function is supported by multiple agents, and thus if one agent fails to fulfill its purpose the function will continue to operate (Hemenway, 2015). This notion of resilience can offer insight into the benefits of involving communities in environmental protection, as involving many actors in support of defending open space will be more resilient than concentrating power under a single institution. This is especially true due to the vested interests of those with political and economic agendas in maintaining the status quo (Frantzeskaki et al, 2018:284). According to Lapachelle and Albrecht (2019:24), communities have been increasingly mobilizing across scales in response to ecological destruction and climate change, hence bringing a "...sense of optimism that collective action at the community level can have profound impacts". According to Ernstson and Sörlin (2009:1460), "...the involvement of civil society in protecting nature (and culture) is on the rise." Often, according to Sacks (2021), it is marginalized and indigenous groups who are the custodians and defenders of ecological and heritage land against powerful, wealthy interest groups.

The realm of ecological relationships thus offers a fruitful testing ground for bottom-up planning. According to Simon (2008:167), the interface between urban and rural space is well positioned for exploring more sustainable urban development. This is due to their growing significance as sources of urban food, recreational spaces and sites for circular water and waste management as discussed in Section 2.2.3 (ibid). In addition to this, Allen (2003:144) claims that participatory planning processes ought to be employed at the urban-rural interface due to the complex social relations and diversity of stakeholders involved in this space. There is a need to improve the cooperation between these stakeholders because, as argued previously, often their interests are

[49] Resilience in natural systems refers to the ability of the ecosystem to adapt to and recover from difficulties due to its diversity.

competing which intensifies the conflict at the urban edge. The following subsection will explore how safeguarding land from development encroachment from the bottom-up can be enabled, enforced and implemented.

2.4.3: Enabling ecologically embedded communities in practise

Community Land Trusts (CLTs) have emerged globally as a means to enable the bottom-up conservation of green space on private or community-owned land (Cullen et al, 2013:1; Galvin et al, 2020:149). CLTs are community-based organizations which are designed to ensure the long-term community stewardship of ecologically important[50] land (Roos, n.d). In general, CLTs and similar arrangements aim to protect land from urban development in perpetuity by attaching a legally-binding conservation covenant to the title deed of the land (Cullen et al, 2013). Often properties under CLTs are clustered together in order to create ecological corridors (ibid).

In Namibia, CLTs have been utilized to simultaneously safeguard wildlife and wildlands, and provide rural communities with livelihoods (Galvin et al, 2020). The aim in this is to reconcile land use conflict between farming and biodiversity conservation, and thus between human and ecological need (ibid). This epitomizes a regenerative approach to development. In the United States (US), the use of CLTs is part of a growing social movement which has been occurring over the past 20 years, where Non-Profit Organizations (NPOs) known as land conservancies acquire land and hold it under trust to protect it from development (Ignaczak, 2013). In Australia, a NPO called the Trust for Nature has been raising funds to purchase conservation land threatened by residential development in order to protect it under a CLT (Cullen et al, 2013). Thus, in some cases, CLTs emerge without government support, usually where communities have enough capital to purchase their own land (Cullen et al, 2013). Where communities do not have access to financial capital, however, there is a need for funding support which is usually provided by the state or NPOs (Galvin et al, 2020). By purchasing and holding property under a long-term conservation agreement, CLTs respond to many of the challenges outlined in Sections 2.3.3 and 2.3.4, such as land speculation, illegal development encroachment and amendments to land use regulations.

Arguably, illegal land uses can be better detected and resisted on the ground by mobilized communities. To draw on Newman's (1966) notion of defensible space[51], embedding ecologically-concerned citizens within a threatened environment can ensure that there are 'eyes on the land'[52] available to identify and prevent transgressions. Additionally, breaking up large

[50]It is important to note that CLTs are not only used for conservation purposes. In some cases, CLTs are used to hold land for affordable housing in the long-term (Roos, n.d; Ignaczak, 2013). Other terms are used to refer to CLTs such as Community-Based Conservancies (CBCs) or Communal Property Associations (CPAs).

[51] The theory of 'defensible space' was coined by planner and architect Oscar Newman in 1972. The theory argues that placing residents on the borders of public space such through physical design of the built form can allow these residents to keep watch and prevent crime through 'passive surveillance' (Donnelly, 2010).

[52] This idea draws on Jane Jacobs's notion of 'eyes on the street', where in *The Death and Life of Great American Cities* (1961) she theorized that in order for a street or a public space to be safe, there should

tracts of land at the urban-rural interface into smaller properties can make the edge more defensible and less vulnerable to land use transformation en masse. Chappell et al (2013:8) note that in Brazil, communities of small-scale regenerative farms have been situated on the border of Protected Areas (PAs) to create a buffer zone where the community is tasked with the strategic protection and reforestation of the PA. This idea of defensible ecological space will be explored and expanded on at length in Chapter 4.

2.5: Conclusion

This Chapter has revealed the importance of preserving open space within and in proximity to cities as a means towards realizing regenerative development. Specifically, the argument has been made that instead of attempting to minimize harm to the environment by separating people and urban activities from natural space, decision-makers ought to strive for systems which integrate people and the environment in mutually-beneficial relationships. The potential of the urban-rural interface as a space where the connections between people and the environment can be enhanced was explored. However, the critical analysis of the current approach to urban growth management revealed that this opportunity has not been harnessed. In fact, urban development encroachment on open space, and especially agricultural land at the urban edge, remains a prevalent issue despite the existence of planning tools such as the urban edge. It was found that firstly, this is due to the lack of proactive planning for the urban-rural interface beyond the delineation of an abstract urban edge line. In this, the urban-rural interface has become an ambiguous and chaotic space, which allows transgressions such as illegal land uses to slip through the cracks undetected. Additionally, as previously discussed, a lack of proactive and positive planning misses an opportunity to cultivate an active urban-rural interface which can reconnect city dwellers to nature through food-growing. The other prevalent issue with the current approach to safeguarding land from development encroachment lies in top-down implementation. Due to rapid urbanization and a high demand for land, open space in proximity to or within cities has become a lucrative commodity. As a result, decision-makers come under pressure to relax urban growth restrictions to allow for development. It was then discussed how safeguarding land from the bottom-up by drawing on the power of mobilized, ecologically-conscious communities can respond to the shortcomings of traditional top-down policing of land. Bottom-up planning has many synergies with the notion of regenerative development, which was proposed as an alternative to the conceptual underpinnings of the current approach to development control. Thus, both bottom-up planning and regenerative development ideas offer means towards responding to the shortcomings of te urban edge. This has set up the theoretical foundations for the ‘living urban edge’ concept, to be discussed in Chapter 4.

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be people around who are able to keep watch on the space and as such enable ‘bottom-up’ surveillance (Battersby & Marshak, 2014).

Chapter 3: Case Study Context- the Philippi Horticultural Area, Cape Town.

3.1: Introduction

The previous Chapter framed the issue which this dissertation aims to respond to, namely the persistence of urban development encroachment on open space. It was indicated that this tension is especially prevalent at the urban-rural interface. Chapter 2 concluded that current top-down planning tools, focusing on the globally utilized urban edge policy, are not fully safeguarding essential ecological and agricultural land from urban development encroachment and externalities. Chapter 2 also began to explore alternatives to the current approach, inspired by bottom-up planning theory and the notion of regenerative cultures and development.

This Chapter aims to ground these ideas and challenges in a case study where the complex issue of urban development encroachment and land use conflict manifests, namely the Philippi Horticultural Area (PHA), located in the City of Cape Town (CoCT) metropolitan area in South Africa. The PHA is a large tract of valuable farmland embedded within the urban fabric and overlies a critically important aquifer, the Cape Flats Aquifer (CFA). The PHA is subject to significant development pressure, urban externalities and political conflict and contestations, despite a long-standing use of planning tools to protect it. As a result, an activist group of regenerative small-scale farmers and concerned residents, the PHA Food and Farming Campaign (referred to in this dissertation as the PHA Campaign), is mobilizing to safeguard the land. The area is thus a microcosm of the tensions and opportunities which are present at the urban-rural interface, as explored in Chapter 2. More broadly, South African cities present a valuable context for investigating the inherent tensions between human resource and spatial needs and the imperative of safeguarding open space in order to ensure regenerative futures. As mentioned in Chapter 2, cities in sub-Saharan Africa are especially subject to the pressures of rapid mass urbanization and consequent encroachment on open space in proximity to and within the urban fabric (Alterman, 2013). In South Africa, given the post-apartheid mandate to provide quality housing and land reform[53] for those dispossessed under apartheid land policies, this pressure is especially acute and politicized. These political pressures are intensified by a particularly lucrative land market dominated by powerful economic elites (Berrisford, 2020).

This Chapter will introduce and analyse the PHA case study. Section 3.2 aims to provide an overview of the broader context of the case study, through firstly assessing South African cities (with a focus on Cape Town) in terms of the regenerative development literature (Sections 3.2.1-3.2.3). This can provide insight into the current performance of the CoCT in terms of securing a regenerative future for both the social and ecological realms. Following this, an overview of urban growth management in Cape Town will be outlined in Section 3.2.4, with a focus on the urban edge tool. Section 3.3 of this Chapter delves deeply into the PHA case study.

[53] In the South African context, land reform refers to government-initiated property and land redistribution to redress apartheid dispossession, particularly of agricultural land (Kirsten & Sihlobo, 2021).

Firstly, a spatial and contextual analysis of the PHA will be provided in Section 3.3.1. Following this, the various facets of the PHA's value in terms of enabling regenerative futures will be explored in Section 3.3.2. In Section 3.3.3 the current approach to planning for and protecting the PHA will be critically analysed, and the problems facing the PHA in terms of development encroachment and urban externalities despite these efforts will be outlined in Section 3.3.4. Finally in Section 3.3.5, the community response to these challenges, with a focus on the PHA Campaign activist group will be discussed, with a view to enabling a more secure future for the PHA. This Chapter was informed by desktop research, Focus Group 1 with the PHA Campaign, and open-ended interviews with two CoCT spatial planners (referred to as Spatial Planner 1 and 2). In addition to this, site visits and photography were utilized to understand and illustrate the issues facing the PHA on the ground.

3.2: Background

3.2.1: South African cities: a story of separation

"Apartheid may have ended 20 years ago, but here in Cape Town the sense of apartness remains as strong as ever. After decades of enforced segregation, the feeling of division is permanently carved into the city's urban form"
(Wainwright, 2014)

The direct translation of 'apartheid' is "separateness", and this rings true for the approach to planning under the apartheid state, which has shaped the reality of South African cities in the present moment. Modernist planning was utilized to create racialized urban spatial structures characterized by top-down imposed control and separation (Haarhoff, 2010:184). Through this, apartheid planning separated both people from people and people from place. In so doing, a sense of dislocation, a lack of rootedness and destruction of community was created. Figure 11 overleaf illustrates how modernist design was used to perpetuate separation in South African cities. Clear parallels can be seen with Abercrombie's London Masterplan, indicated on Figure 9.

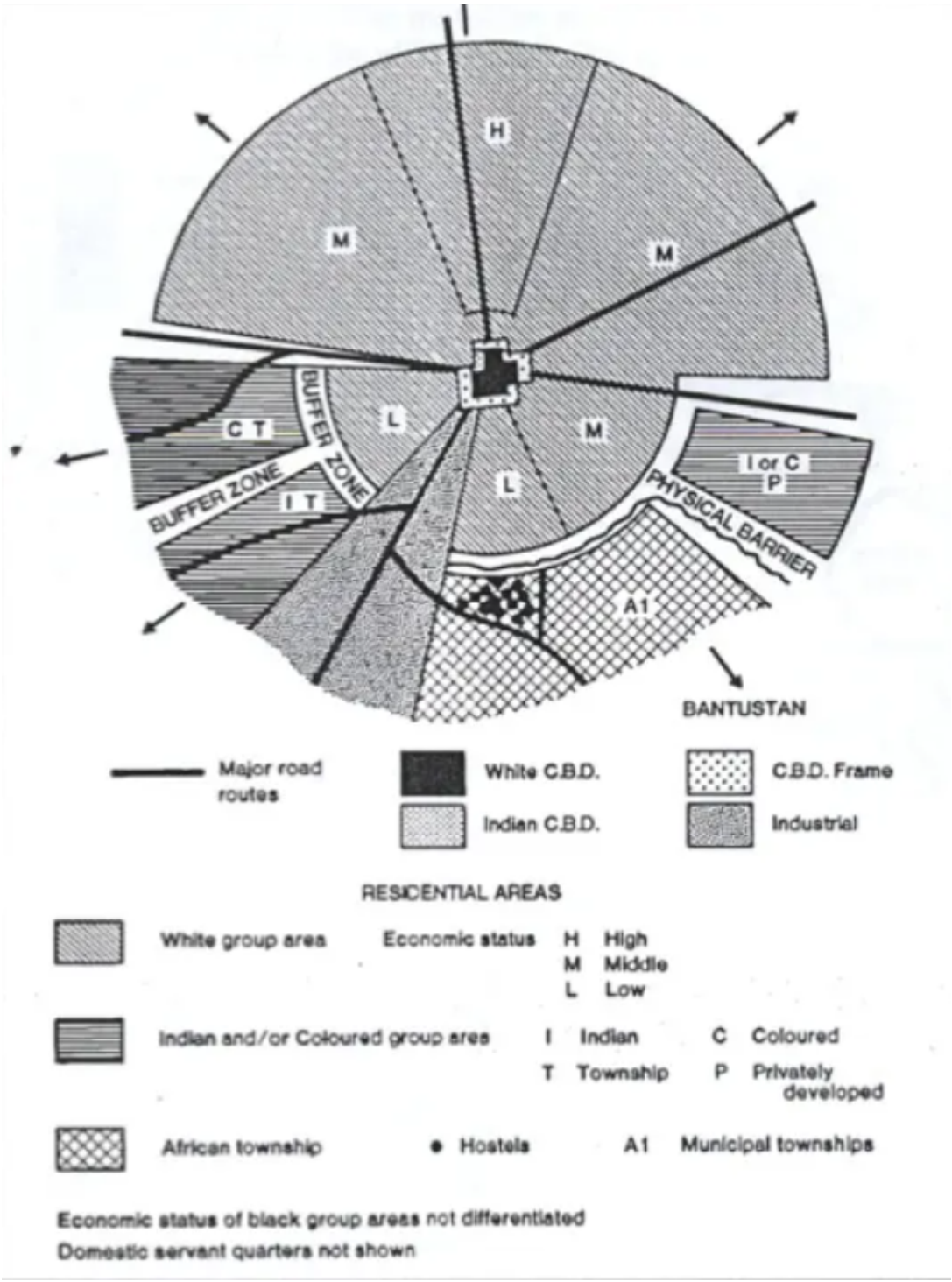


Figure 11: a conceptual plan for Cape Town under apartheid with clear parallels to modernist design as described in Chapter 2.[54]

[54] Source: Wainwright, O. 2014. (Image). Apartheid ended 20 years ago, so why is Cape Town still a 'paradise for the few'? *The Guardian.* April 30. Available: https://www.theguardian.com/cities/2014/apr/30/cape-town-apartheid-ended-still-paradise-few-south-africa [2021, August 19].

This narrative of separation extended into the socio-ecological relationship, where green space and ecosystem services were concentrated in proximity to wealthy suburbs (Haarhoff, 2010). In this, People of Colour (PoC)[55] were dispossessed of the land with which they had long-standing cultural, social and economic ties, and as a result these communities were severed from relationship with the ecological realm (Venter, 2020). In addition to this, polluting industries and ecological hazards were externalized onto poor communities existing on the periphery of the city (Lehtinen, 2009; Dixon & Ramutsindela, 2006:129). PoC were also afforded the lowest quality land in cities, preventing them from growing their own food, hence depriving these communities of food sovereignty (Battersby & Marshak, 2014). This dynamic remains starkly present in the post-apartheid moment, leading Venter et al (2020) to claim that South African cities continue to exist under a state of 'green apartheid[56]', and that, "The clear links between urban green infrastructure and human wellbeing implies that equitable access and distribution of quality urban nature is a matter of human rights[57]".

Additionally, apartheid policies led to an agricultural sector where food-production is concentrated under the power of a small elite group of white industrial farmers. The dispossession which occurred under apartheid thus did not only deprive PoC of housing. The inability to own land also resulted in a deprivation of food sovereignty and self-sufficiency in terms of access to food. In over two decades since apartheid, land reform efforts in South Africa have failed to alter the country's agrarian structure (Cousins, 2016). According to Lahiff and Cousins (2005), "Agricultural land is concentrated in the hands of approximately 45 000 corporate and individual owners, who are overwhelmingly white." This was corroborated by a 2017 state land audit, which stated that 72% of agricultural land in South Africa remains white-owned (Pretorius, 2019). In addition to this, farm workers remain trapped in exploitative labour relationships (Indego Consultants, 2018). In addition to this, food security and especially access to quality nutrition amongst poor South Africans is dire (Sihlobo, 2021). This situation has worsened with the current COVID-19 pandemic (ibid). Large scale riots and looting of stores across South Africa earlier in 2021 where a large amount of the goods stolen were food indicate the consequences if the country's hunger crisis is not resolved (Nkrumah, 2021). Clearly, the current situation is no longer tenable and radical change needs to occur. Thus, environmental justice[58] and land redistribution have become a pressing post-apartheid redress imperative in addition to other political and economic issues (Dixon & Ramutsindela, 2006:131). However, the prevailing decision-making narrative continues to conceive of socio-economic development and the land required for this development to be in competition with ecological protection, as subsection 3.2.2 will discuss.

[55] See glossary for full discussion of this term.
[56] Venter et al (2020) use this term to describe the currently disproportionate spatial distribution of access to green space and ecosystem services across racial and income groups in South Africa.
[57] The importance of access to green space for human wellbeing was outlined in detail in Chapter 2.
[58] Lehtinen (2009) defines 'environmental justice' as equality in access to ecosystem services, and the right of all people to a healthy environment free of ecological hazards and pollutants.

In a context of climate change, where the importance of ecosystem services and environmental protection are rapidly gaining prevalence within political and planning agendas, urban growth management tools have been used throughout South Africa's local municipalities since the early 2000s (Horn, 2020; Horn, 2019; Sim, Sutherland & Scott, 2016; Theron, 2016; Jansen van Rensburg & Campbell, 2012). In addition to ecological motivations, growth management tools are a key component of a suite of spatial planning tools utilized to promote the post-apartheid transformation of South Africa's divided and fragmented cities (Horn, 2019:959; Cilliers, 2009:942). Particularly, the urban edge spatial planning tool has been utilized[59] in the post-apartheid era in an attempt to reconstruct and integrate sprawling, fragmented and inefficient cities (Sim, Sutherland & Scott, 2016:37; Horn, 2019:965). This poor spatial form continues to exacerbate both socio-economic inequality as well as the loss of natural resources and agricultural space (ibid). Typically, the urban edge will appear in a local municipality's Municipal Spatial Development Framework (MSDF), which is the spatial planning representation of the Integrated Development Plan (IDP), a policy document which guides development planning (CS Consulting, 2013). The MSDF provides a 20-year vision for the local area's spatial transformation (SANBI, 2021). Municipalities are required to compose an MSDF every 5 years, and this document must align with the Provincial level SDF (the PSDF) and the principles embedded within the Spatial Planning and Land Use Management Act (SPLUMA). Hence, in critiquing Cape Town's approach to urban growth management, Section 3.3.3 will analyse the City's MSDF in which the urban edge is contained.

However, as is the case globally as outlined in Chapter 2, urban development encroachment on green space remains a prevalent issue in South Africa despite the existence of planning tools such as the urban edge (Sinxadi & Campbell, 2020; Katumba & Everatt, 2021; Bernstein, 2019). The following subsection will unpack how environmental decisions and policies are made and implemented in South Africa (with a focus on the CoCT), in order to begin to understand why urban development encroachment has remained such a prevalent issue.

3.2.2: Outlining South African decision-making paradigms

Planning and decision-making approaches in South Africa remain characterized by a modernist and top-down paradigm. However, as discussed in Chapter 2, top-down implementation is vulnerable to the meddling of powerful interest groups. According to Horn (2019:965), the contemporary South African political landscape has followed the global trend towards neoliberalism. The neoliberal standpoint as discussed in Chapter 2 sees restrictive spatial policies such as the urban edge as an impediment to the free operation of market forces in guiding property development. As such, field research conducted in South Africa's local municipalities by the DEAT found that in many cases market pressures lead local authorities to contradict strategic planning policies (DEAT, 2005). According to Horn (2020:576), the rise of neoliberalism in South Africa is a result of post-1994 economic stagnation resulting in greater leniency towards developers in order to pursue GDP growth. According to research undertaken by the DEAT (2005), the predominant political motivation for amending environmental

[59] The City of Cape Town (CoCT), eThekwini, Gauteng, Plettenberg Bay and Tshwane Municipalities have explored this strategy.

protections to facilitate high-value developments is the financial benefit that increased rates and taxes can bring. This is corroborated in the Cape Town context by CoCT spatial planning officials in interviews conducted by Horn (2020:592). The planners argued that the municipality's political narrative views "...any new development as good development", and as such strategic planning objectives and environmental protections are overlooked and undermined in support of private sector development and investment (ibid). This was evident in 2012, when former Mayor Patricia de Lille stripped the CoCT planning and development committee of its decision-making powers after the planners opposed a development de Lille was pushing for in the PHA (Yeld, 2012; Olver, 2019).

As discussed in Chapter 2, the prevailing approach to environmental decision-making globally is based on trade-off decisions between development and environmental protection. This leads to the incremental erosion of environmental protections. In 2019, the South African Council for Planners (SACPLAN) released a statement on World Planning Day stating that, "At its heart, planning is about equity: it serves to balance the competing demands and needs of all people and of the built and natural environment" (SACPLAN, 2019; quoted on Govender & Mammon, 2020:117). This firmly roots the approach to planning in South Africa in the trade-off narrative central to the sustainable development discourse discussed in Chapter 2. This is evident in the characterization of the needs of society and the environment as inherently conflicting. When these trade-off decisions are made from the top-down, often the option which will bring the most political support is chosen as outlined in Chapter 2. According to Todes (2008), strategic planning documents such as SDFs are often ignored or undermined in site-level decision-making in South Africa. According to Horn (2019:973) and Battersby (2016), the prevailing case-by-case approach to land use decision-making in South Africa leads to the incremental erosion of strategic spatial objectives. As articulated by Cirolia (2013:308), "The blatant disregard for the existing frameworks and strategies (in South Africa) both devalues the existing instruments available to officials to guide development and undermines important and well consulted decisions regarding the future spatial form of the city. This sets a precedent for (more) undemocratic and contra-policy decisions."

Flaws in the decision-making and planning process in South Africa have manifested explicitly in the development management space, and particularly in the implementation of urban edges. The case of the PHA illustrates this and will be discussed in detail in Section 3.3. Another controversial urban edge amendment in the CoCT was requested in 2011 in order to allow for the construction of a new satellite city known as WesCape on agricultural land 17km north of the built up edge of the CoCT (Horn, 2020:586). The developers received approval to shift the urban edge to permit the development in 2013 (Cirolia, 2013:302). This contradicts the CoCT's commitments to densification, infill development and combating urban sprawl. Beyond this, the development will convert open space into urban use which contradicts the regenerative principles put forward in Chapter 2, despite the developers framing the development as a 'sustainable city' (Cirolia, 2013:302). Similar issues have been faced in other South African municipalities such as Gauteng, leading Cilliers (2009:943) to conclude that "...after years of unsuccessful implementation, it was evident that (the urban edge) alone was not enough to change the urban form."

Decision-making in terms of agricultural land embedded within urban environments is also extremely complex in South Africa due to unclear mandates and competencies between different levels of government. SPLUMA (2013) designates local municipalities as the primary land-use planning authorities (Indego Consultants, 2018). However, the Western Cape Land Use Planning Act (LUPA) of 2014 states that municipal land use decisions pertaining to the rezoning of conservation or agricultural land must be subject to the approval of the provincial land use planning Head of Department (ibid). In the case of the PHA specifically, this complexity becomes compounded because the area harbours sand resources which are classified as strategic resources and as such these areas fall under the authority of the National Department of Minerals and Energy (Battersby-Lennard & Haysom, 2012). According to Battersby, Haysom and Park-Ross (2007), local government is highly inactive in the sphere of food security due to a lack of clarity in mandates. The overarching mandate for food security rests with the National Department of Agriculture, Rural Development and Land Reform (DALRRD) (ibid). The result is that trade-off decisions made at the local level do not adequately assess the implications of developments on food systems. A major issue also lies in the fact that the final decision regarding amending spatial planning policies such as the urban edge is under the authority of a single individual (the Mayor) (Horn, 2020:594). Thus, Horn (2020:594) states that due to the predominantly pro-developer policy environment described in Section 3.2.1, the decision-making process "runs the risk of falling prey to pro-capitalist (read elitist) decisions." This reiterates the critique of the current approach to the top-down implementation of urban edges put forward in Chapter 2. The following Section will expand in more detail how these issues, and the spatial issues discussed in Section 3.2.1 manifest in Cape Town.

3.2.3: The City of Cape Town- a city of tension, inequality and socio-environmental separation

The CoCT is emblematic of the broader spatial issues outlined in Section 3.2.1, and epitomizes unsustainable urban-environmental relationships as set out in Chapter 2. As is the case across sub-Saharan Africa, Cape Town has been subject to rapid urbanization, with the Western Cape at large experiencing the second highest urbanisation rates across South Africa (CoCT, 2016). Most of this urban growth is concentrated in the CoCT metropole (ibid). With a housing backlog of 400 000 people in 2012, a shortfall which will likely increase as the population grows, the pressure to provide housing in the City is immense (Battersby-Lennard & Haysom, 2012). Spatially, the growth of the CoCT has been predominantly horizontal[60], resulting in continual urban sprawl encroaching upon valuable open space and perpetuating an unsustainable and car-dependent urban form (Doig, 2013; Horn, 2019:964). In fact, the African Green Cities Index found that Cape Town harboured the second lowest density of the 15 major African cities that were studied (ibid). The CoCT's urban footprint increased by 40% between 1985 to 2005 due to widespread urban sprawl (ibid). This has served to gradually erode the available green space within and in proximity to the city. This development pressure has been compounded by a lucrative property market, with a high demand especially for luxury residential developments which utilize a large amount of space (Muller, 2021). In addition to this, the Department of Environmental Affairs and Tourism [DEAT] (2005) reported that developer speculation on

[60] Horizontal urban growth is characterized by an expanding urban footprint, as opposed to vertical urban growth where the existing urban footprint is densified.

agricultural land is especially an issue in the CoCT, as well as in the Garden Route, West Coast and Overberg regions[61]. Thus, according to Doig (2013), "...as a rising city in the continent's economic powerhouse, Cape Town is caught between two competing interests: Undoing its Apartheid legacy, and courting developers who want to build there."

As discussed in Chapter 2, the availability of open space within and in proximity to cities is essential for climate change resilience and cultivating regenerative futures. In Cape Town, climate change impacts are manifesting most significantly in the water sector. Over a decade ago, City officials were prompted by scientists to enhance the CoCT's water resilience due to projected water scarcity (Welch, 2018). This projected water scarcity will likely decrease agricultural productivity and hence food security (Indego Consultants, 2018). This will have knock-on effects on public health, livelihoods and the local economy (ibid). One essential planning measure towards enhancing water security, as discussed in Chapter 2, is the protection of open space in order to enhance the permeability of the urban fabric and hence the ability of rainfall to infiltrate and replenish the water cycle[62]. However, a lack of proactive water resilience planning in response to these warnings culminated in the 2018 Cape Town Water Crisis, where the City was predicted to run out of potable water on a widely feared 'Day Zero' (Welch, 2018). In the wake of this crisis, and with the threat of further crises in the future, the City has been attempting to diversify its water sources (Hyman, 2020). This has led to a growing emphasis on safeguarding groundwater resources so that they may be used to bolster water supply (ibid). Thus, safeguarding open space, especially in areas overlying Cape Town's major aquifers, indicated on Figure 12 is essential for the City's climate change resilience.

[61] These regions are all District Municipalities in the Western Cape of South Africa.
[62] This approach to water sensitive urban design is arguably more cost effective and less ecologically destructive than the technical solutions the City is pursuing, such as desalination (Welch, 2018).

Figure 12:Cape Town's groundwater sources. The Cape Flats, Peninsula and Atlantis & Silwerstroom aquifers are the three important aquifers which lie within Cape Town's boundaries. As will be discussed in Section 3.3, the study area overlies a significant portion of the Cape Flats Aquifer[63]*.*

Additionally, climate change will see South African cities at large facing extreme increases in hot temperatures due to the urban heat island effect. As such, safeguarding green space is essential for providing relief for these effects. Thus, given the growing impacts of climate change on the CoCT, any decisions regarding long-term land use and city growth should be made with this in mind (Indego Consultants, 2018). As previously mentioned, climate change is increasing food insecurity throughout the world. In addition to this rampant socio-economic inequality, which has been aggravated by the COVID-19 pandemic economic crisis, has created a hunger crisis in the CoCT. According to research undertaken by Battersby (2011), 80% of surveyed households[64] in low-income areas in Cape Town were either moderately or severely food insecure.

Cape Town's spatial form is also symbolic of the persistence of 'green apartheid' in South Africa, discussed in Section 3.2.1. Figure 13 illustrates the stark inequalities in access to green space

[63] Source: City of Cape Town. 2018. *Water Outlook Report*. Available: https://resource.capetown.gov.za/documentcentre/Documents/City%20research%20reports%20and%20review/Water%20Outlook%202018_Rev%2030_31%20December%202018.pdf [2021, August 11].
[64] 1060 households were surveyed in Ocean View, Browns Farm (Philippi) and Enkanini and Kuyasa in Khayelitsha.

and related ecosystem services in the City. Clearly, the Cape Flats area where the majority of Cape Town's poor reside is particularly devoid of green space. Residents of the Cape Flats generally live in cramped, unhygienic conditions due to a lack of basic services and infrastructure, leading to severe mental and physical health issues (Wainwright, 2014). The current 2018-2022 IDP acknowledges that this dynamic needs to change, and centers equal access to quality open space as a key priority for supporting spatial justice[65] (CoCT, 2018a:54).

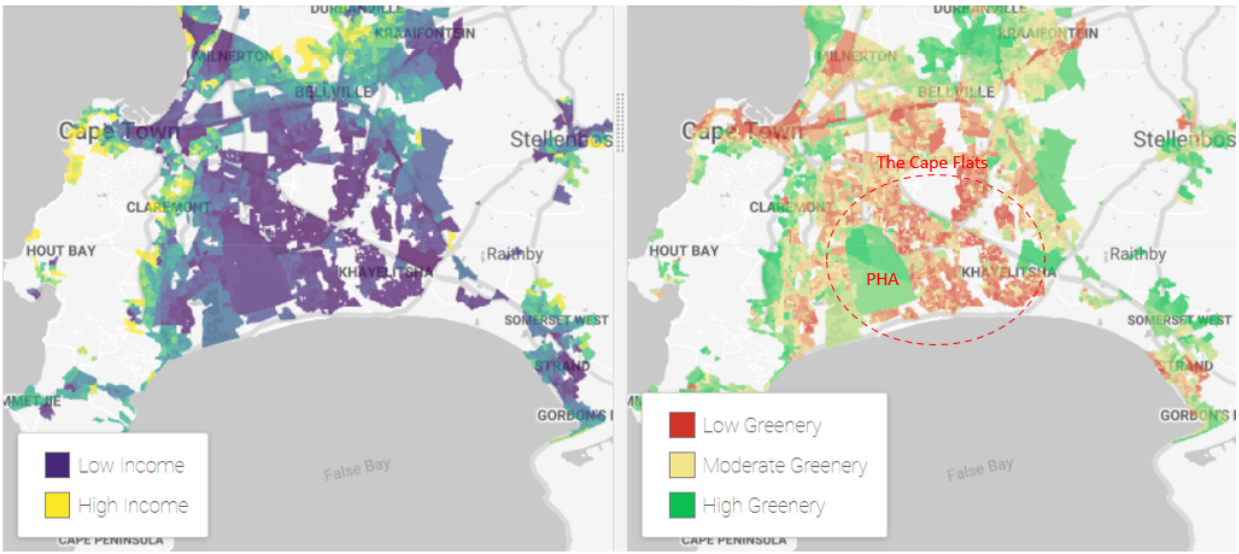


Figure 13: spatial mapping of access to green space in Cape Town across income groups[66]. Clearly, the PHA is a critical source of green space in the Cape Flats.

Hence, protecting and enhancing open space in Cape Town, and especially in areas deprived of green space, is essential if the City is to see a regenerative future and avoid widespread social, economic and ecological crisis. Urban agriculture is emerging in Cape Town as a significant response to social fragmentation, economic distress and poor ecological and human health (Olivier & Heinecken, 2017:173). Given the threats posed by climate change, and the prevalence of food insecurity and poor access to ecosystem services, more citizens in the CoCT (and nationally) are investing in urban agriculture as a livelihood strategy and source of income and nutrition (Indego Consultants, 2018). According to Battersby and Marshak (2014), community urban agriculture holds the potential to address social fractures, ecological issues and economic inequality concurrently. In addition to this, connecting people to nature through food growing can help repair the fractured socio-environmental relationship and enhance psychological well-being, as discussed in Chapter 2 (ibid). In the Cape Flats context, where violence and crime are part of the lived reality of residents, urban agriculture has the potential to revitalize neglected and 'deadened' spaces, and restore a sense of community which apartheid

[65] Spatial justice is one of SPLUMA's key principles, and relates to equality in access to land (Department of Rural Development and Land Reform [DRDLR], 2015).
[66] Source: Adapted from Venter, Z., Shackleton, C., Van Staden, C., Selomane, O. & Masterson, V. 2020. (Image) Green Apartheid: Urban green infrastructure remains unequally distributed across income and race geographies in South Africa. *Landscape and Urban Planning.* 203. Available: https://doi.org/10.1016/j.landurbplan.2020.103889

planning aimed to fragment. According to interviews conducted by Olivier and Heinecken (2017) with urban farmers in the Cape Flats, urban agriculture brings multiple social, psychological, spiritual, economic and ecological benefits to residents. Thus, preserving this urban activity is an essential means towards solving the issues facing the City outlined in this Section in an integrated way. The following subsection aims to introduce the current approach to safeguarding open space (with a focus on urban agricultural land) in the CoCT, with reference to policy and legislation at a national, provincial and local level. This will lead into the case study in Section 3.3, where the current approach to development control in order to protect open space will be critically assessed through the PHA case study.

3.2.4: Planning in response to development encroachment in Cape Town

Various policy and legislation imperatives at the provincial and national level mandate municipalities to safeguard ecologically important open space from development encroachment. These are indicated in Figure 14 The supreme legal document of the country, the Constitution, supports densification and environmental protection and expresses the right to a healthy environment as an inalienable human right (South African Constitution, 1996). However, Govender and Mammon (2020:111) note that the rights enshrined within the Constitution often come into tension with one another in complex and interconnected cases. In the case of the PHA conflict, as will be described in detail in Section 3.3, the constitutional rights to the environment, food and water and the right to housing come into conflict (Govender & Mammon, 2020:112). This coheres with the discussion in Chapter 2 regarding the tension between socio-economic development and environmental conservation which the prevailing sustainable development discourse creates by framing these issues as trade-off decisions.

The National Environmental Management Act (NEMA, Act 107 1998) states that in assessing the environmental impacts of a development through the Environmental Impact Assessment (EIA), urban edges must be taken into account (CoCT, 2009). NEMA also creates a legislative mandate for the pursuit of environmental justice and the protection of the environment (ibid). Also at a national level, SPLUMA mandates a spatial planning system which is protective of the environment. The principle of spatial justice is also central to SPLUMA, and states that spatial planning and land use management should redress the spatial imbalances created by apartheid planning (ibid). This principle could be extended to include an imperative towards reversing the spatial expression of the ‘green apartheid’ previously discussed. SPLUMA also advocates for the notion of spatial sustainability, which includes an onus on land use decision-makers to “...ensure that special consideration is given to the protection of prime and unique agricultural land” and to “limit urban sprawl.”

At a provincial level, the Western Cape Provincial Urban Edge Policy guideline, put together by the Department of Environmental Affairs and Tourism [DEAT], was drafted to guide municipalities in establishing urban edge policies (DEAT, 2005). This was done in compliance with the Provincial Spatial Development Framework (PSDF) as a means to implement its growth management objective, as well as in compliance with the Constitutional mandate to facilitate sustainable development (ibid). The policy clearly states that the intention of an urban edge is to

protect natural resources, promote densification and combat urban sprawl (ibid). Thus, the policy tool is intended to both redress apartheid segregationist spatial planning and to safeguard agricultural and conservation land. Particularly relevant to the 'living urban edge' concept to be proposed in Chapter 4, the Provincial Urban Edge Policy Guideline states that local urban edges "...must also contribute to the creation of opportunities for the establishment of small farmers and the informal sector, through community-based livelihood projects" (DEAT, 2005). This indicates a supportive policy environment for the proposed concept at a Provincial level. The Provincial Urban Edge Policy Guideline also introduces two urban edge typologies, namely 'hard' and 'soft' edges (DEAT, 2005). 'Hard' edges involve an immediate transition from urban to rural land use along a clear cadastral boundary, whereas 'soft' edges involve a more gradual transition from urban to rural land use (ibid). In the case of 'soft' edges, low-intensity development such as recreational space or smallholdings are used between urban and rural space in order to create this more subtle transition (ibid).

In Cape Town, the first delineation of the urban edge was set out in the 2002 MSDF following a number of in-depth studies undertaken since 1998 (Sim, Sutherland & Scott, 2016:39). This was guided by the City's first urban edge policy document, drafted in 2001 (CoCT, 2009). This document took the approach of preparing four separate and specific reports and urban edge guidelines for different parts of the municipality[67] (Horn, 2020:589). The motivation for more context-specific urban edge guidelines, according to the CoCT, was to avoid generalized and ambiguous policy statements which could be easily twisted and used to substantiate any development application to amend the urban edge (DEAT, 2005). The most recent CoCT Development Edges policy for implementing urban and coastal edges[68] in the municipality's SDFs was drafted in 2009[69] and replaced the 2001 policies (CoCT, 2009).

[67] Namely for Melkbosstrand, the Southern Peninsula, the Northern Metro and the Helderberg area. Draft guidelines were put together for Atlantis, Mamre, Pella, Philadelphia and Klipheuwel, but were never implemented (CoCT, 2009).
[68] A coastal edge is a similar concept to the urban edge, where an edge line is demarcated along the coast beyond which urban development cannot occur (CoCT, 2009). According to the CoCT (2009), the purpose of this is to "...to protect coastal resources and avoid hazards and financial risks pertaining to areas at the risk of flooding."
[69] Whilst this policy was never formally adopted, according to Spatial Planner 1, it is still used to guide decision-making.

Figure 14: Diagram indicating the policies and laws relevant to the urban edge in the CoCT. Author's own.

According to the policy, the purpose of delineating urban edges is to promote a "...more sustainable spatial growth path...(through the) protection of valuable natural resources and a compact form of urban growth" (CoCT, 2009). Particularly relevant to this dissertation, the policy notes that development edges should protect natural and agricultural resources[70] (ibid). The policy was put together to streamline the fragmented 2001 urban edge policies (ibid). However, this led to an ambiguous and general metropolitan scale urban edge policy, which contradicted the original intention to avoid this form of policy due to its openness to interpretation and hence its ineffectiveness in practise. This, again, sets up an argument for the proposed concept in Chapter 4, which sets out to provide context-specific spatial guidelines for the urban edge bordering the PHA. The 2009 CoCT Development Edges policy defines the urban edge as "...a medium to long-term edge line where the line has been demarcated in a position to prevent urban sprawl or to protect natural resource boundaries" (CoCT, 2009). As indicated on Figure 15, on either side of the edge line 'urban edge management zones' are recommended, which are areas where specific land use guidance should be provided in order to enable the effectiveness of the urban edge (ibid). However, according to Cilliers (2009:943), in practise the implementation and interpretation of the urban edge is more simplistic, "...manifesting as a development line on a map." The impacts of this approach to urban edge implementation will be discussed at length in the following Section.

[70] In addition to this intention, other key intentions include preventing urban sprawl in order to support the development of a viable public transport system and to rationalise infrastructure and service-delivery to designated areas in order to improve cost-effectiveness (CoCT, 2009).

Figure 15: Conceptual diagram indicating the urban edge in the CoCT Development Edges Policy (2009).[71]

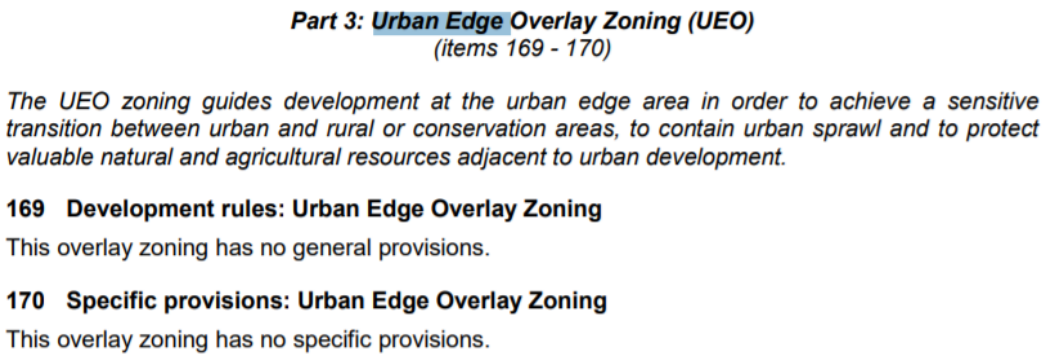
As previously mentioned, the urban edge is implemented through the MSDF which is the spatial representation of the IDP. The current CoCT IDP (2018-2022) Spatial Priority 2 is to "Manage urban growth, and create a balance between urban development and environmental protection." Of particular importance to this dissertation, the Spatial Priority calls for planners to "...take into account biodiversity, aquatic resources and networks as well as agricultural areas when planning new development" (CoCT, 2018a:54). The current MSDF itself will be unpacked in more detail in Section 3.3.

The urban edge is not intended to be a long-term, fixed line. Instead, every 10 years the City is required to review the current edge and can make adjustments based on development trends as well as the availability of land within the edge and its ability to support growing populations (CoCT, 2009; Horn, 2019:970). Any amendments between these decennial reviews are developer-driven and must be assessed on a case-by-case basis (CoCT, 2009). The 2009 Development Edge policy establishes guiding principles for assessing such amendment applications and states that "Development Edge lines should not be compromised whilst development opportunities still exist within surrounding urban areas" and that amendment decisions must account for the long-term future (CoCT, 2009). Especially significant to the case study is the statement that "Critical and significant elements of the Metropolitan Open Space System (MOSS) as well as high/medium potential agricultural land must be protected. As a general principle Development Edge lines delineated to protect these resources should not be amended" (ibid). However, the guidelines also leave a 'loophole' for developers by stating that an amendment may be granted if the development provides at least 50% of the land for affordable housing due to the housing crisis in the city (ibid). This has enabled the City and

[71] Source: CoCT, 2009.

developers to frame the protections on the PHA as an impediment to alleviating the CoCT's housing backlog, as will be discussed in Section 3.3.

The Municipal Planning Bylaw (MPBL, 2015) zoning scheme also contains policy statements regarding the urban edge, and provides the urban edge with legal status. Figure 16 below indicates the guidelines relating to the Urban Edge Overlay (UEO) contained within the MPBL.



Part 3: Urban Edge Overlay Zoning (UEO)
(items 169 - 170)

The UEO zoning guides development at the urban edge area in order to achieve a sensitive transition between urban and rural or conservation areas, to contain urban sprawl and to protect valuable natural and agricultural resources adjacent to urban development.

169 Development rules: Urban Edge Overlay Zoning

This overlay zoning has no general provisions.

170 Specific provisions: Urban Edge Overlay Zoning

This overlay zoning has no specific provisions.

Figure 16: Urban Edge Overlay Zone in the CoCT zoning scheme[72].

Compared to other zoning regulations within the zoning scheme, the guidelines for the UEO are minimal. This reinforces the argument that currently, the spatial planning approach to managing the urban-rural interface in Cape Town is insufficient for contending with the complexity of this space. Thus, there is clearly a need for more proactive and detailed guidelines for planning for the urban-rural interface within the CoCT's planning law and policy. The following Section will critically analyse the effectiveness of Cape Town's implementation of urban edge policies

3.3: PHA Case Study- Contextual Analysis

The PHA is an area of farmland embedded within the CoCT urban fabric. This land is essential for securing a regenerative future for Cape Town, as will be outlined in detail in Section 3.3.2. According to Rose and Patel (2015:239) it is situated in "...a complex environment-- on the boundary between urban and non-urban, in a city with gross inequalities." The farmlands have been gradually diminished by urban development encroachment due to various reasons (see Section 3.3.4). As a result, what was once 3200 hectares of horticultural land in 1988 has been whittled down to approximately 1884 hectares of actively farmed space in the present moment (Swart, 2012). Thus, the PHA serves as an ideal case study for investigating the encroachment of urbanity on open space, and especially at the urban-rural interface which is particularly vulnerable to this encroachment, as outlined in Chapter 2. This Section will begin with a spatial analysis of the case study in subsection 3.3.1. Following this, the various facets of the area's value will be outlined in subsection 3.3.2. Subsection 3.3.3 will discuss how decision-makers have acknowledged this value on various occasions and have hence attempted to protect it through planning policy. Subsection 3.3.4 will discuss the issues of urban development encroachment and externality which threaten the PHA despite this long-standing policy

[72] Source: CoCT, 2015.

consensus. Finally, subsection 3.3.5 will explore how mobilized communities in the PHA offer an opportunity for responding to these issues in a regenerative and bottom-up way, hence building on the theoretical basis put forward in Chapter 2.

3.3.1: Spatial analysis

The PHA is situated approximately 20 kilometers southeast of the city centre (Swart, 2012). It is part of the Cape Flats District[73] of the City, and is located in the metropolitan context on Figure 17. In the 1980s, during the apartheid era, the Group Areas Act established the Cape Flats as a space to relocate communities dispossessed of their land in the City centre (Govender & Mammon, 2020:105). This legacy has persisted into the present and currently residents in the Cape Flats survive on low incomes, and service-delivery and access to green space is poor (ibid). The PHA is bordered by Philippi Industria and Mitchell's Plain on its eastern edge, Hanover Park to the north, Ottery and Lotus River on the western edge and Strandfontein to the south, as indicated on Figures 17 and 19. Some of the city's poorest residents live in these suburbs, and violence and crime is rife (Swart, 2012). This location within a densely populated and expanding urban context makes the PHA especially vulnerable to urbanisation development pressures (Indego Consulting, 2018; Govender & Mammon, 2020:98). As indicated on Figure 17, the PHA is also in proximity to and well connected with many of the CoCT's key nodes. This strategic location makes the area especially vulnerable to development pressure.

[73] Within the CoCT, there are eight sub-metropolitan districts under which planning and administration is streamlined.

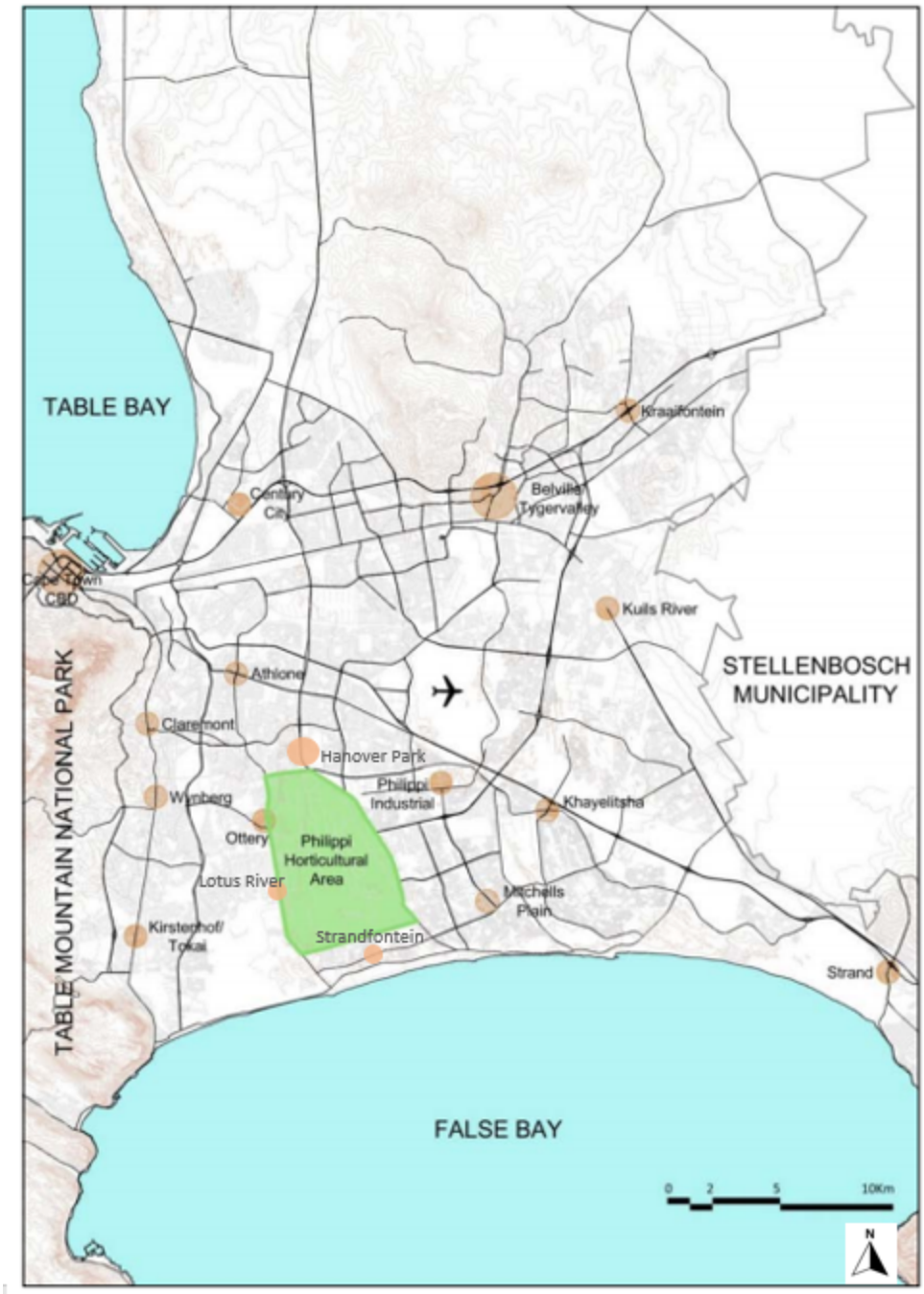


Figure 17: the PHA identified in Cape Town[74]*.*

At a metropolitan scale, as indicated on Figure 18, the PHA is an essential open space linkage within the broader Metropolitan Open Space System (MOSS). This is essential for ecosystem functioning and movement of biodiversity. As indicated on Figure 18, it is one of the few pockets of agricultural space within the metropolitan area, with the majority of the CoCT's agricultural

[74] Source: Adapted from Govender, T. & Mammon, N. 2020. (Image). A Clash of Rights in the Legal and Spatial Planning Contexts: the Case of the Philippi Horticultural Area. *Journal for Juridical Science.* 45(2): 98-127. DOI: https://dx.doi. org/10.18820/24150517/ JJS45.i2.4.

land located on the periphery of the City. Additionally, as will be discussed at length in Section 3.3.2, the PHA is one of the only open spaces overlying the Cape Flats Aquifer (CFA), which is designated by the South African National Biodiversity Institute (SANBI) as a Strategic Water Source Area (SWSA). A SWSA is an area of land that supplies a large quantity of surface water runoff and contains groundwater of national importance (SANBI, 2020).

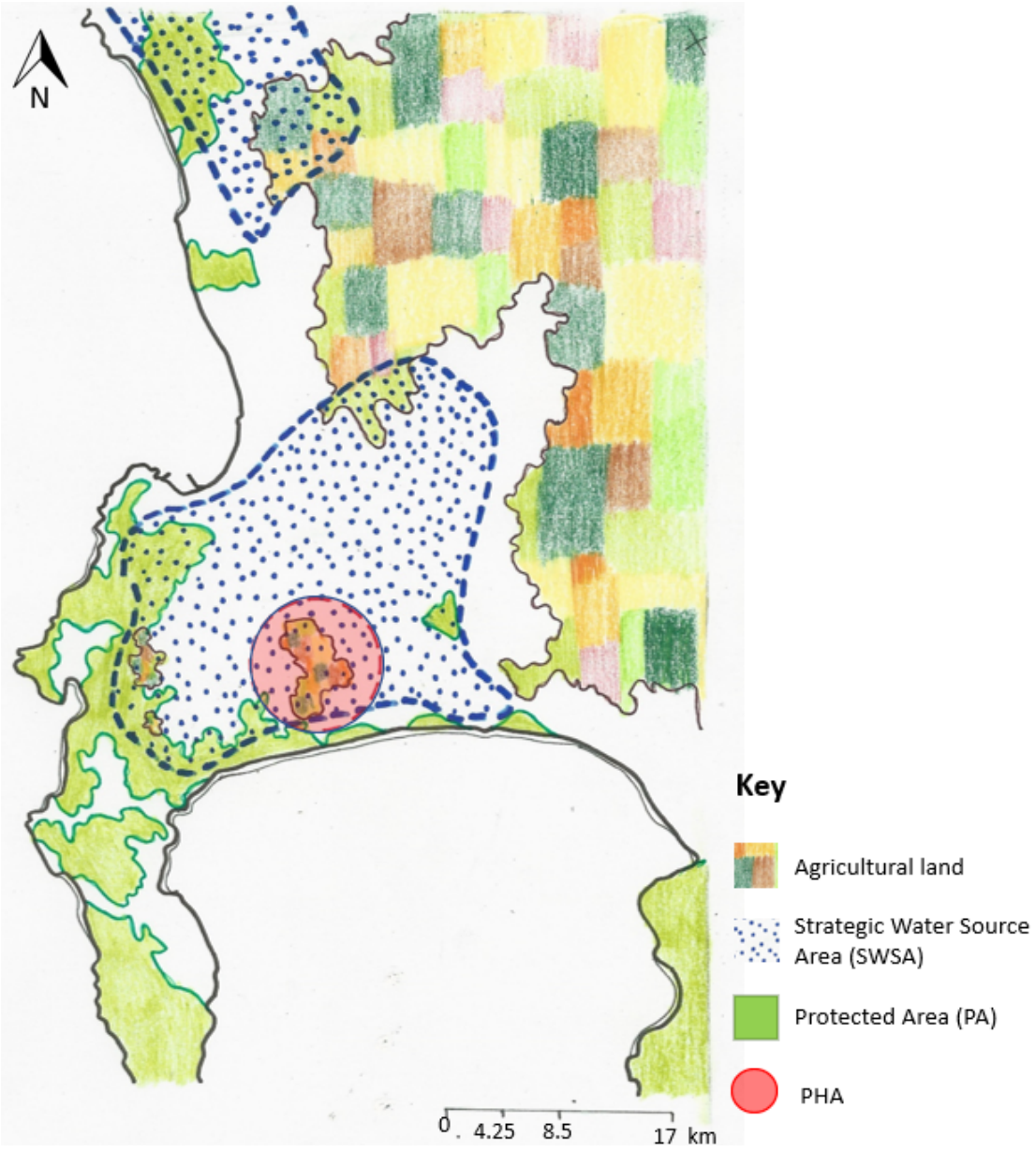


Figure 18: the PHA located within the broader metropolitan ecological context.

The 'greater' PHA (the entire area on Figure 19) is approximately 3168 hectares and includes areas of residential and industrial use as well as informal housing (Indego Consultants, 2018). The 'core' of the PHA which remains actively and intensively farmed (labelled as 'core farm area' on Figure 19) is approximately 1884 hectares, with an average farm size of 32 hectares

(Battersby-Lennard & Haysom, 2012). The areas of the PHA which are no longer intensively farmed due to development encroachment are known as 'buffer areas', namely the Schaapkraal Smallholdings area on the Western edge, the Lansdowne Industrial area on the Northern edge and the Weltevreden Wedge on the Eastern Edge (see Figure 19). Historically, these 'buffer' areas formed part of the farmlands, but over time these land portions, comprising approximately 900 hectares in total, have been lost to development (Shoba, 2020). The intention of the 'buffer' areas, as articulated by the CoCT 2009 Development Edge policy, is to "Mitigate negative impacts of urban development on farmlands by establishing a transition zone of low intensity uses" (CoCT, 2009:6). However, as will be discussed in Section 3.3.4, these transition zones are not meeting this intention and instead are becoming high intensity urban areas with land uses that are destructive to the character of the PHA.

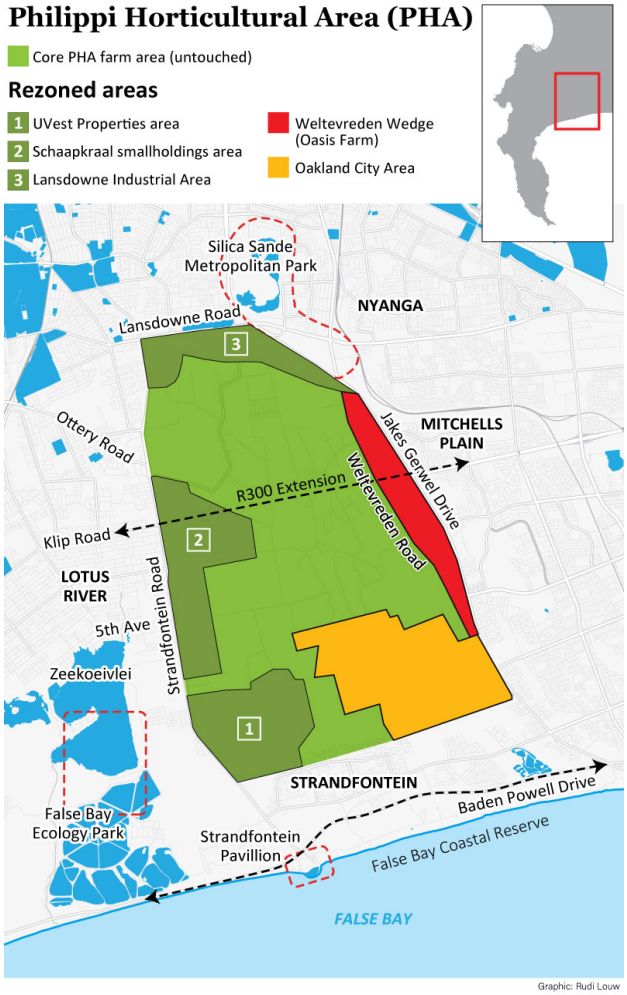


Figure 19: the PHA's 'core' and 'buffer' areas[75]*. The UVest and Oakland City areas will be discussed in Section 3.3.4.*

[75] Source: Shoba, S. 2020. (Image). Our Oasis: Living on the edge of urban encroachment. *Daily Maverick.* February 28. Available: https://www.dailymaverick.co.za/article/2020-02-28-our-oasis-living-on-the-edge-of-urban-encroachment/ [2021, August 14].

As indicated on Figure 20, there are 8 informal settlements in the 'buffer' areas of the PHA, and 1 informal settlement within the 'core' of the PHA. Egoli and Jim se Bos (numbered 1 and 4 on Figure 20 respectively) informal settlements are the largest settlements in the area, with 350 and 300 homes recorded in the 2011 census respectively (Swart, 2012).

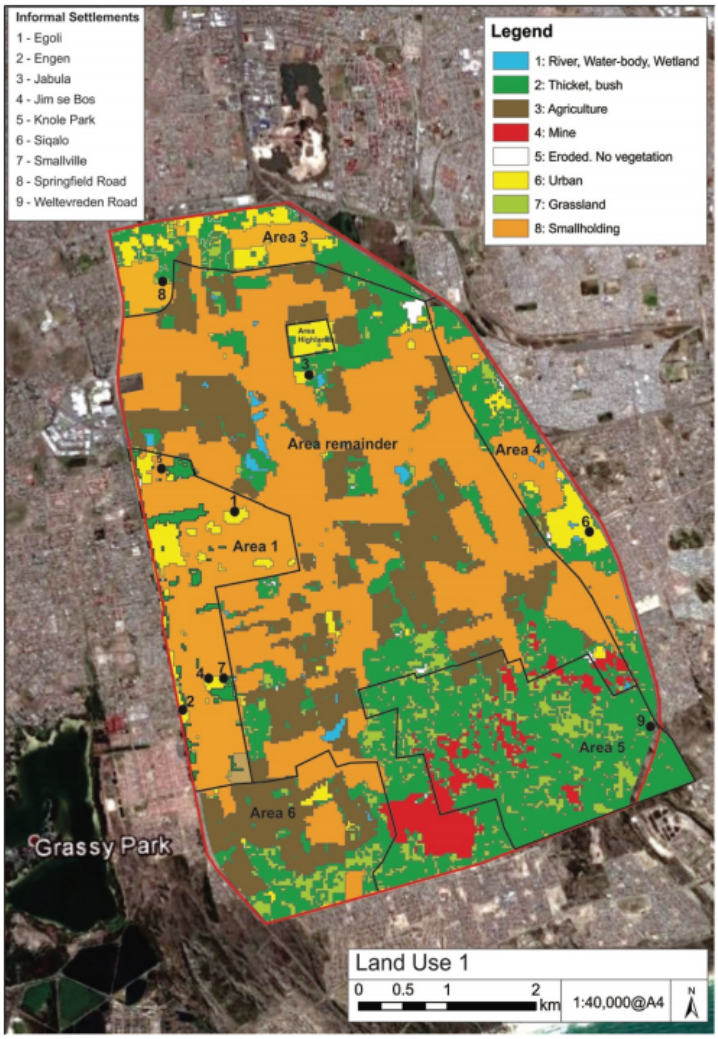


Figure 20: Land use within the PHA[76].

[76] Source: Setplan. n.d. (Image) *Socio-Economic Agricultural Plan for the Philippi Horticultural Area.* Unpublished report.

These informal settlements have been growing rapidly. In 2012, it was estimated that there were 790 shacks in Egoli, which is more than double what was reported in the 2011 census (Swart, 2012). The growth of Jim se Bos informal settlement between 1999 and 2014, located in the Weltevreden Wedge buffer area, is indicated on Figure 21 to indicate the rapid growth of these settlements.

Figure 21: the growth of Jim se Bos informal settlement over time[77].

The PHA is bounded by Strandfontein Road (M17) along its western edge, Govan Mbeki road (M9) along its northern edge, Jakes Gerwel drive (M7) to the east and Strandfontein residential area to the south. All of these roads (indicated on Figure 22) are higher order movement routes at the metropolitan scale, and receive a significant amount of traffic. The CoCT also plans to develop a Bus Rapid Transit (BRT) route along Strandfontein Road, which will significantly increase urban development pressure and traffic volumes on the PHA's western edge (Setplan, 2018). This is an asset in terms of the economic connectivity of the area to the rest of the City, but creates a challenge in terms of preserving the rural character of the area since these routes involve a large amount of activity and movement. The PHA forms a spatial barrier in terms of

[77] Source: Theron, F. 2016. (Image). The Urban Anthropocene: The Case of Urban Encroachment Upon the Philippi Horticultural Area, Cape Town. Master of Urban and Regional Planning: Stellenbosch University.

east-west high speed mobility through the City. As such, an extension of the R300 is proposed through the core of the PHA, as indicated on Figure 22. This will be discussed in detail in Section 3.3.3.

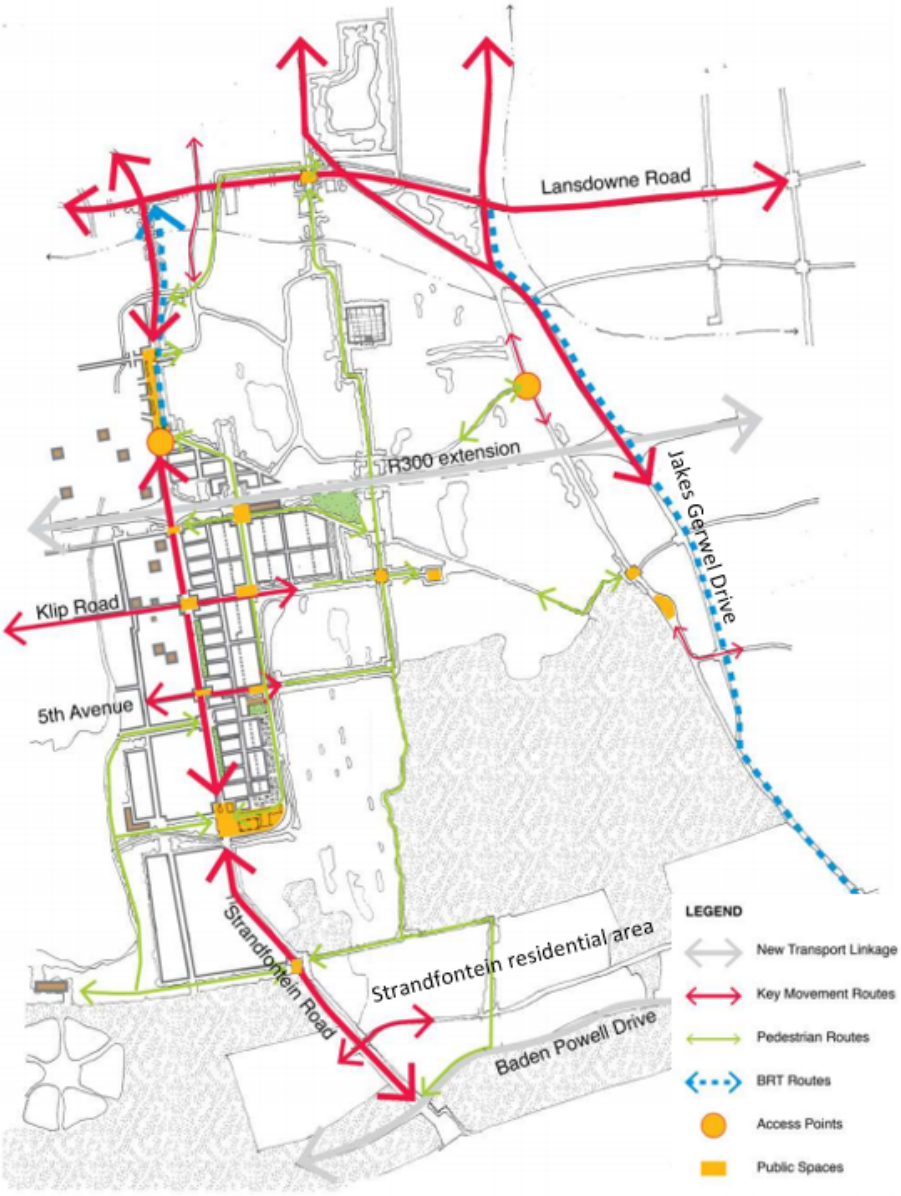


Figure 22: key movement routes and linkages to/from and within the PHA[78].

[78] Source: Adapted from Setplan. n.d. (Image) *Socio-Economic Agricultural Plan for the Philippi Horticultural Area.* Unpublished report.

3.3.1.1. Detailed spatial analysis: 'buffer' areas

Figure 23 indicates the portions of each buffer area which are indicated on the buffer area typology maps (Figures 24i-iv). This subsection will unpack the spatial dynamics of the buffer areas in more detail.

Figure 23: buffer area typologies indicated in space. Source: Author's own adapted from Cape Farm Mapper.

i) Schaapkraal smallholdings (western edge)

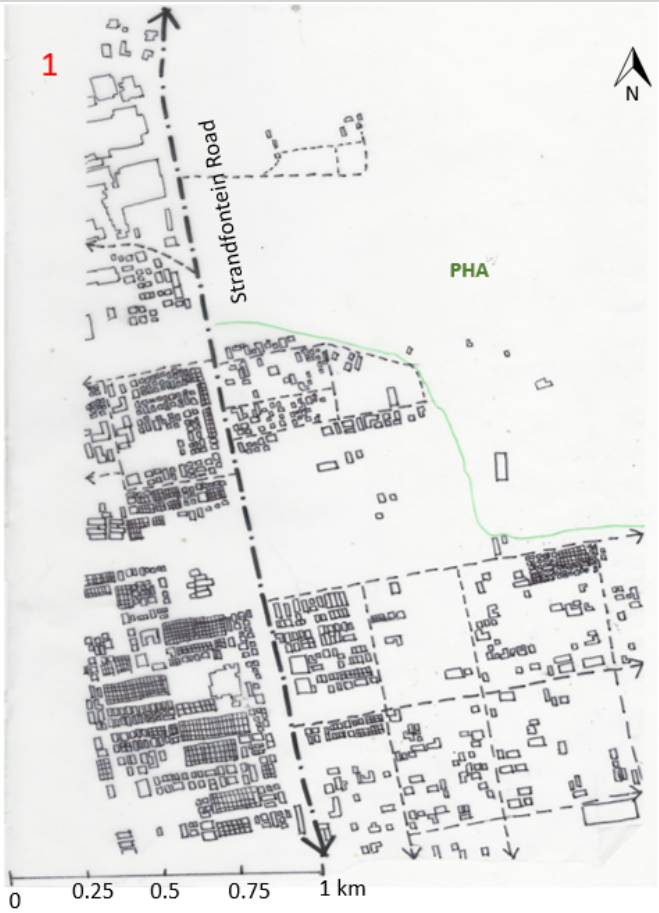


Figure 24i: Schaapkraal smallholdings edge typology. Source: Author's own.

The Schaapkraal 'buffer' area consists of 140 smallholding plots and is indicated as Area 2 on Figure 19 above and Area 1 on Figure 23 (Swart, 2012). The Provincial Urban Edge Guideline (2005) defines smallholdings as either urban agricultural plots where the primary use of the property is income generation through urban agriculture or 'merely low density residential uses' where the owners employ urban agriculture to supplement their primary income or nutrition needs (DEAT, 2005). According to Spatial Planner 1, the Schaapkraal smallholdings area was intended by spatial planners to form a 'buffer' area of small-scale farming plots[79] on the western edge of the PHA. However, over time the area has transformed largely into a residential suburb, thus contravening the intended vision for the buffer area as an area of small-scale urban agriculture and rural character. According to Spatial Planner 1, this was largely an informal process which happened without landowners going through formal land use application processes. As such, much of the properties in the Schaapkraal area contravene zoning restrictions. This is enabled by the fact that the same zoning scheme restrictions apply to residential settlements, smallholdings and small farms in the area (iKapa Enviroplan & City Think Space, 2013). Currently, only four of the 140 smallholdings are actively used for horticulture (Swart, 2012). The remaining plots are functioning as residential and commercial developments, with 41 currently functioning as dump and storage sites for construction and as bus depots (ibid).

[79] It is important to note here that this is very similar to the proposed 'living urban edge' concept. However, as will be put forward in Chapter 4, land use can be better secured and enforced through property arrangements such as the Community Land Trust (CLT) discussed in Chapter 2.

According to a study[80] commissioned by the CoCT in 2013, the issue of urban encroachment in the PHA is especially pronounced in the area abutting the Schaapkraal smallholding buffer (iKapa Enviroplan & City Think Space, 2013). This was corroborated by Spatial Planner 1, who stated that the Schaapkraal area has seen "massive change" relative to the other parts of the PHA, and Spatial Planner 2 stated that the area is seeing constant applications for rezoning. This will likely intensify if the City goes forward with implementing BRT on Strandfontein Road, as previously mentioned. Further discussion as to why this is the case, and what lessons can be learnt from this in planning for the long-term preservation of the PHA will take place in Section 3.3.4. According to Spatial Planner 2, studies undertaken in the PHA have identified quality view lines extending from Strandfontein road into the PHA. Thus, the western edge of the PHA offers potential for providing a gateway into the PHA. This will be expanded on in Chapter 4. .

ii) Lansdowne industrial area (northern edge)

The northern portion of the PHA is abutted by a large industrial and commercial area. Only 23.8% of this buffer area, indicated as area 3 on Figure 19 above, is farmed (Setplan, 2018). The area also has poorer quality groundwater compared to the rest of the PHA. Currently, the Lotus River canal acts as a spatial barrier preventing development intrusion from the north into the PHA (CoCT, 2021:89). As such, the threat of development encroachment in this area is relatively low.

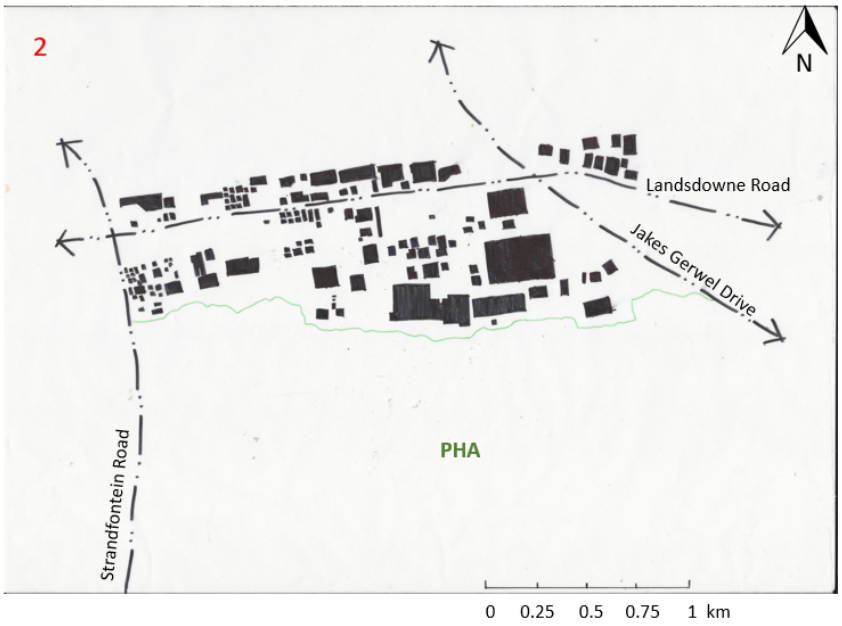


Figure 24ii: Landsdowne industrial area edge typology. Source: Author's own.

[80] The study, 'Urban edge and development guidelines study for the Schaapkraal area and environs in the Philippi Horticultural Area' was commissioned by the City to inform the drafting of an urban edge in the next MSDF by providing more detail on the highly complex western edge of the PHA.

iii) Weltevreden Wedge (eastern edge)

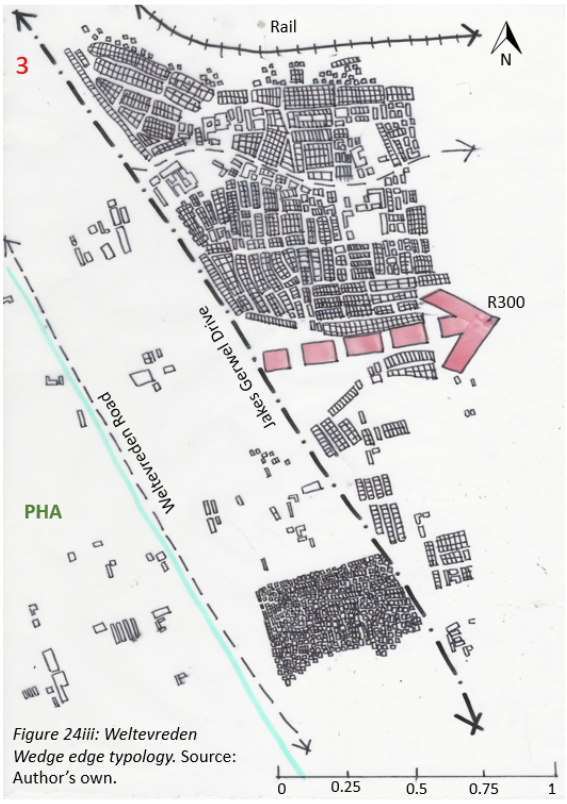
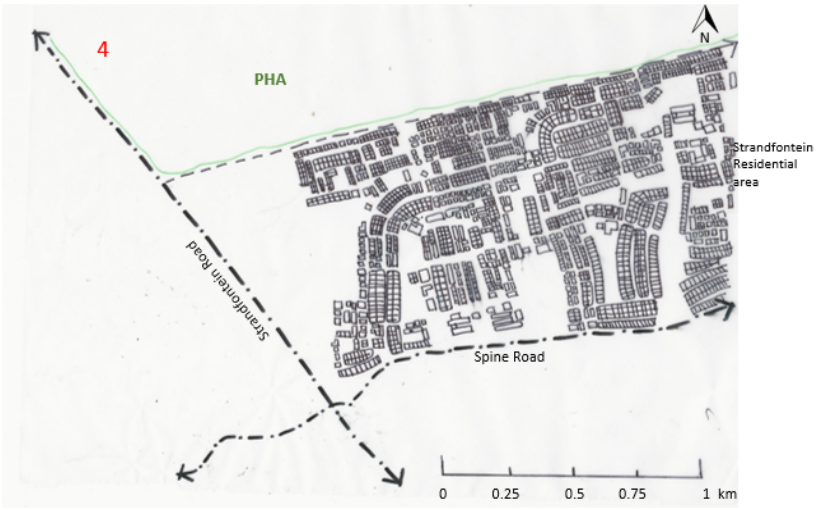


Figure 24iii: Weltevreden Wedge edge typology. Source: Author's own.

The Weltevreden Wedge area is immediately adjacent to high density residential areas, namely Browns Farm and Mitchell's Plain, indicated on Figure 17. It is bounded by Jakes Gerwel Drive and Weltevreden Road. According to the CoCT (2011), this part of the PHA is not being farmed and has not historically been farmed, except for a small portion in the extreme south. As such, large portions of the Weltevreden Wedge are currently earmarked for low-cost housing (Indego Consultants, 2018). According to the 2021 Draft Cape Flats District Spatial Development Framework (CFDSDF), the northern portion of the Weltevreden Wedge above the proposed R300 extension (indicated on Figure 22) is designated for future industrial development, whilst the area south of the proposed R300 extension is designated for medium to high-density residential development (CoCT, 2021:122). If this housing is not implemented in a way that is sensitive to the adjacent farmlands, it will fail to spatially define a positive and active rural-urban interface and instead will threaten to create a harsher pressure on the surrounding farmlands due to higher densities. Thus, innovative new approaches to housing provision are needed in this space.

iv) Southern edge- UVest area (south-west quadrant) and Oakland City area (south-east quadrant)



The Southern portion of the PHA borders Strandfontein residential area, indicated on Figure 24iv. The portion of the PHA adjacent to the residential area is subject to two high profile and controversial development applications, the Oakland City (south-east

quadrant) and UVest (south-west quadrant) developments. These areas are subject to an ongoing legal battle for amending the urban edge to facilitate urban development. More detail regarding these applications is provided on Figure 35 and in Section 3.3.4. The purpose here is to spatially analyse and characterize these land areas.

The UVest land area (289.89 hectares) was proposed for development by UVest Property Group in 2016, and the developers plan to develop upmarket housing, retail and a private school (Olver, 2019:100). Various development applications have been refused by the Western Cape High Court and Heritage Western Cape (Isaacs, 2017). The area is well-used, with 53.9% of this area being farmed in 2018. It is a significant agricultural resource since the microclimate in this part of the PHA allows for the year-round cultivation of leafy crops such as lettuce (Setplan, 2018). As indicated on Figure 33 and in Section 3.3.2, this land area also harbours various seasonal and permanent wetlands.

The Oakland City land area (482.13 hectares), as indicated on Figure 35 is currently subject to a legal battle for rezoning for urban use. The developers planned to develop approximately 30 000 houses and a privately run prison (Olver, 2019:100). This area is currently not predominantly famed, with only 21.9% of its land area under cultivation in 2018 (Setplan, 2018). However 67% of the land area comprises sensitive naturally vegetated dunes and wetlands, and as indicated on Figure 33 in subection 3.3.2, is characterized as a Critical Biodiversity Area (CBA)[81]. As such, it is an essential habitat for biodiversity. Additionally, as indicated on Figure 30 in subsection 3.3.2, the proposed Oakland City development overlies the highest yielding fortune of the CFA in the area. Thus, developing this land will have adverse impacts on the ability of the aquifer to recharge.

3.3.2: The value of the PHA- towards a regenerative Cape Town

"The living, breathing Cape Flats Aquifer and her custodian the PHA farmlands will play a key role in securing the city's future water, food and climate security." (Nazeer Sonday, PHA small-scale farmer, 2019).

The PHA has been classified as land of unique agricultural and ecological potential, with no comparable land within a 120-kilometer radius to the City center (Indego Consulting, 2018; Battersby-Lennard & Haysom, 2012; CoCT, 2018). The following subsections aim to unpack the various elements of the PHA's value, with reference especially to how this land can enable a more regenerative future for Cape Town.

[81] A CBA is classified by the South African National Biodiversity Institute (SANBI) as areas which are essential for meeting biodiversity targets for ecosystems, species and ecological processes (SANBI, n.d). SANBI maps CBAs to inform land use planning and environmental authorisations (ibid).

i) Cultural and social value

According to the CoCT (2007), the PHA is "...a product of a dynamic, creative and cultural interaction between the natural environment and its inhabitants over time." Culturally, the area is of critical heritage importance, due to recent discoveries of Khoisan artifacts[82] and historic sites, as well as being host to a number of farmhouses and estates dating back to the 1800s, such as Sonnenstrahl historic farmhouse, which is located near to the western edge of the PHA and indicated on Figure 25 (Battersby-Lennard & Haysom, 2012; CoCT, 2007).

Figure 25: Sonnenstrahl historic farmhouse, near the Schaapkraal edge. Author's own.

Within the PHA, farm roads buffered by trees planted historically as windbreaks create scenic routes which contribute to landscape character. The area is thus characterized by a unique horticultural and smallholding landscape (iKapa Enviroplan & City Think Space, 2013). As such, Indego Consultants (2018) describe the PHA as a "...veritable open air and rural living museum." Figures 26i-v indicate the landscape character and scenic value of the PHA. Residents and small-scale farmers in the area who have lived in the PHA for decades were initially drawn to it due to a rich sense of place and a quiet, natural and semi-rural lifestyle (Robins, 2021). This is a lifestyle that is generally not affordable for the average South African, and which is usually enclosed in gated estates or found in exclusive suburbs. The area also provides a rare and essential oasis of green space or a 'green lung' in the Cape Flats, where access to ecosystem services is limited, as indicated on Figure 13 in Section 3.2.3 (Olver, 2019; CoCT, 2007). Battersby and Marshak (2014) argue that urban community farms such as those of the small-scale PHA farmers can "...alleviate some of the alienating aspects of modern lifestyles, restoring a sense of place to the urban context." The PHA has the potential to provide quality recreational areas and spaces for environmental education and immersion for residents of the Cape Flats. This can enable expanded wellbeing and public health, as argued in Chapter 2.

[82] Importantly, this fact has not been included in official documentation regarding the PHA's significance, which points to a broader issue of invisibilizing pre-colonial heritage resources.

Figure 26i: scenic value of the PHA. Source: Author's site photography

Figure 26ii: scenic value of the PHA. Source: Author's site photography

Figure 26iii: scenic value of the PHA. Source: Author's site photography

Figure 26iv: Weltevreden Road- historic tree planting along road edges creates landscape character. Author's own.

Figure 26v: Wetlands and views to the mountains create high quality scenic value. Author's own

As indicated on Figure 27, there are a number of recreational attractions and facilities in close proximity to the PHA. There is great potential for linking these attractions to the PHA to create a scenic destination place of metropolitan significance. Non-Motorized Transport (NMT) links should be especially prioritized in order to enhance the recreational potential of this part of the City, and enhance accessibility since most farm workers within the 'core' areas travel by means of NMT (Spatial Planner 2, personal communication 2021).

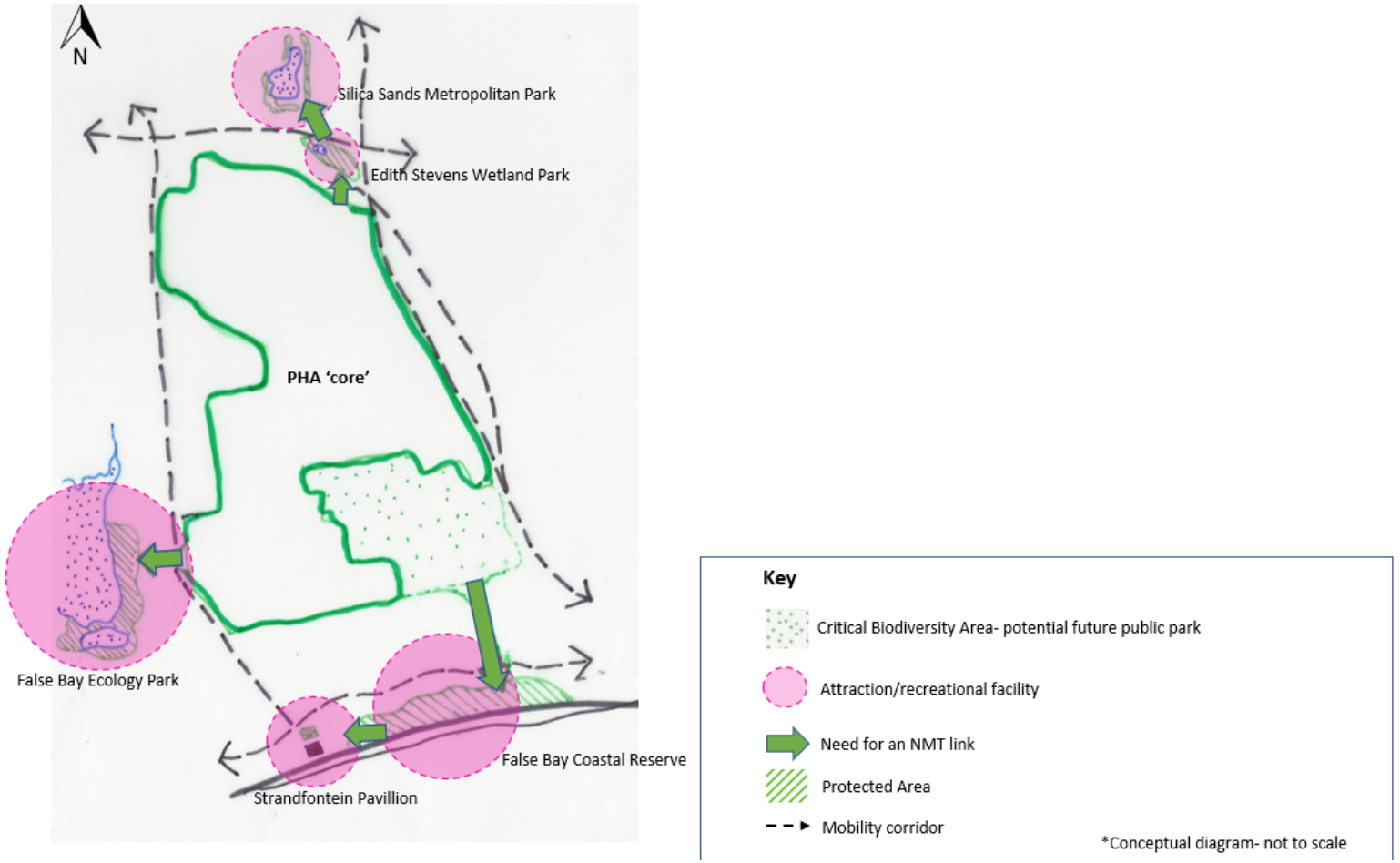


Figure 27: Attractions in proximity to the PHA. Source: Author's own.

Additionally, as discussed in Chapter 2, urban agriculture has the potential to enhance social capital and community relationships and support systems. Battersby-Lennard and Haysom (2012) note that in the PHA there is "...a new and active group of committed emerging smallholder farmers...(who) are investing significantly in the land and in their communities." These emerging farmers have been facilitating social development and wellbeing through nature excursions, school outings, remedial activities and education (ibid). As will be discussed in Section 3.3.5, the PHA Campaign centre especially has become a site of community connection and development in the area.

ii) Economic and livelihood support

The PHA currently supports approximately 3000 direct jobs and 30 000 indirect jobs, with the potential to contribute to more livelihoods if pro-poor economic development and land reform is promoted (Indego Consulting, 2018). According to the CoCT, 70% of farmworkers in the PHA were illiterate women in 2009, thus indicating the importance of the area in providing livelihoods to marginalized women (CoCT, 2009). Emerging small businesses related to farming in the area, such as seedling suppliers and compost producers are also providing opportunities for diversified livelihoods, as indicated on Figure 28i (Battersby-Lennard & Haysom, 2012).

Figure 28i: a small agri-business on the PHA western edge. Source: Author's site photography.

The informal economy and food system in the area, largely supplied by emerging small-scale farmers, is also thriving and supports multiple livelihoods (ibid). Figures 28ii and iii indicate some of the economic activity related to the sale of fresh produce in the PHA.

Figure 28ii: farm stall within the PHA.
Source: Author's site photography.

Figure 28iii: informal vegetable seller, Strandfontein road.
Source: Author's site photography.

The PHA also holds the most important silica sand deposit for the CoCT area, and is one of three building sand sources for the City (Battersby, 2016). It has been argued by economists that allowing for the mining of this sand is essential since transporting construction sand further than 80km is not economically viable (ibid).

More generally, the PHA contributes approximately R484 million direct and R938 million indirect turnover to the economy (Indego Consulting, 2018). Overall, the agri-processing and urban agricultural industries are a growing sector in Cape Town and as such there is a strong case for investing in these industries for metropolitan scale economic growth (CoCT, 2020). Between 2008 and 2018, the CoCT's agricultural sector's Gross Value Added (GVA)[83] increased from 4.9 to 5.8% (ibid). In addition to this, the area is well-connected spatially in terms of its ability to cultivate linkages with other components of the CoCT agricultural value chain, as indicated on Figure 29.

[83] GVA is an economic indicator which measures a sector's contribution to the broader economy (Kenton, 2021).

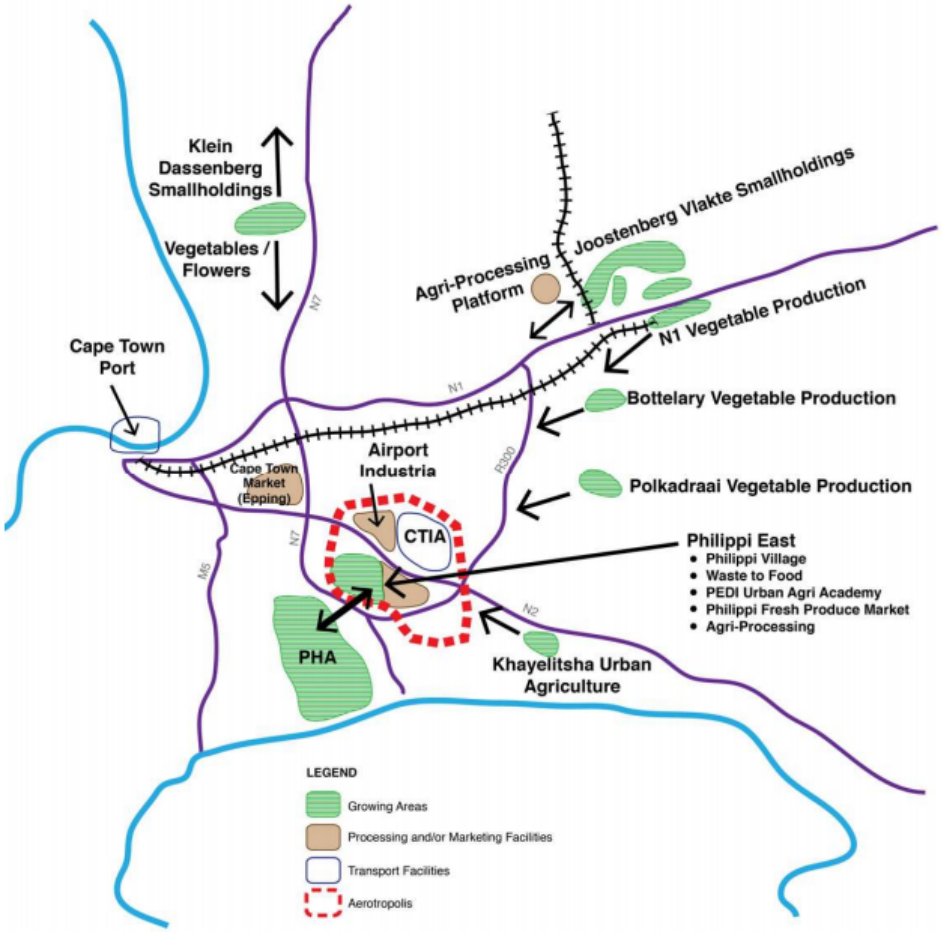


Figure 29: the PHA is economically well connected and linked within the broader metropolitan agricultural sector[84].

According to a study commissioned by the CoCT (iKapa Enviroplan & City Think Space, 2013), the PHA is also well-positioned to enhance South Africa's progress in implementing agricultural land reform due to its proximity to urban markets and the urban poor (iKapa Enviroplan & City Think Space, 2013; Battersby-Lennard & Haysom, 2012; CoCT, 2009). This was corroborated by Indego Consultants (2018), who state that "...all the elements are in place for a successful agrarian reform model- the availability of land, water, climate, skills, different producer types, market access and knowledge." Whilst this dissertation does not focus on the land reform element, it is important to note that the conceptual framework put forward in Chapter 4 can support land reform efforts in the CoCT subject to further research. This is essential given the issues outlined in Chapter 2 with the current industrial agricultural sector which exploits and degrades both people and natural resources. Enabling land reform through regenerative

[84] Source: Setplan. n.d. (Image) *Socio-Economic Agricultural Plan for the Philippi Horticultural Area.* Unpublished report.

small-scale agriculture offers a means towards initiating food sovereignty and resolving the currently inherent conflict between monoculture farming and ecological conservation.

iii) Water security

As indicated on Figure 30, the PHA is located above the highly important Cape Flats Aquifer (CFA), discussed in Section 3.2.1. According to Indego Consultants (2018), the PHA is located over the portion of the CFA with the best groundwater potential and quality. Since the PHA is an oasis of open space in an otherwise densely built up part of the City, it is a critical aquifer recharge area since it is the largest remaining open space overlying the aquifer (Alexander, 2018; CoCT, 2012). It has been estimated that the CFA can supply up to 30% of the CoCT's potable water needs (Isaacs, 2017). The quality and quantity of groundwater is the best in the south-east and south-west of the PHA, where the Oakland City and UVest developments are proposed (iKapa Enviroplan & City Think Space, 2013). As such, these developments threaten the CoCT's water security. This is indicated on Figure 30, where aquifer transmissivity represents the ability of the aquifer to yield groundwater for use. Clearly, the PHA, and especially the south-east quadrant (the Oakland City area) overlies a high yielding portion of the aquifer.

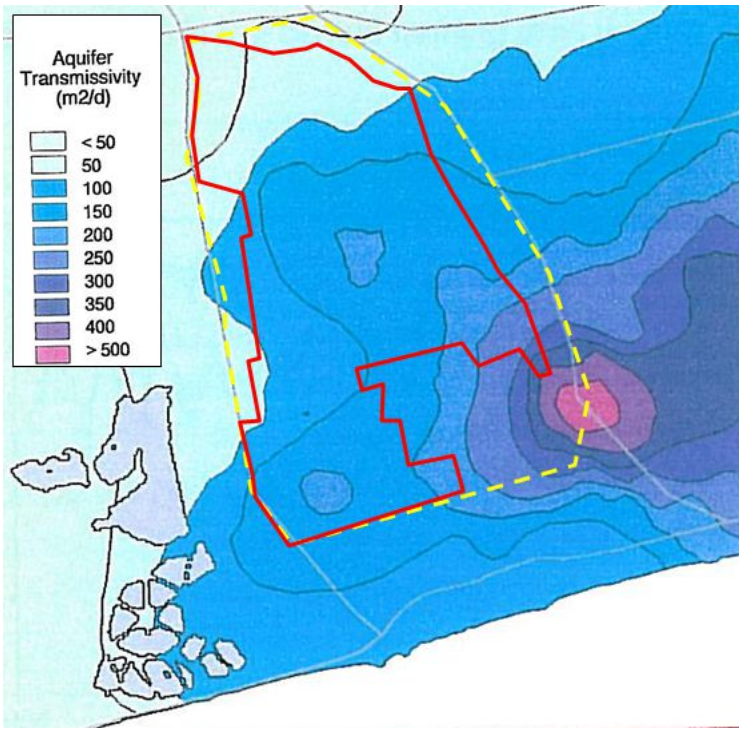


Figure 30: the PHA indicated in relation to the CFA.[85]

[85] Vassell, C. 2013. (Image). *Philippi Horticultural Area (PHA): Human impact on the environment.* Available: https://slideplayer.com/slide/3834502/ [2021, August 18].

The presence of the CFA has been cited as one of the primary reasons that year-round farming is possible and productive in the PHA (Knight, 2019). This has also made the PHA especially drought-resilient since farming is not reliant on rainfall volumes. According to farmers operating in the PHA, the CFA enabled farming to continue during the 2018 water crisis relatively unaffected (Sonday; quoted in Knight, 2019). It is important to note that the high water table also results in regular flooding during the winter, making low-cost housing provision in the area particularly difficult and costly, especially given the changing climate and the increasing prevalence of extreme rainfall events (Taylor, 2013). The flooding issue is exacerbated by a lack of quality stormwater drainage systems in the area (iKapa Enviroplan & City Think Space, 2013; observations from PHA ACT meeting, 2021). Additionally, the shallow water table renders the aquifer highly vulnerable to seeping pollutants (Malan, 2014). As such, ideally farmers in the PHA need to employ regenerative agriculture practises such as using organic compost as opposed to chemical fertilizers. This is a practise employed by many of the emerging small-scale farmers spearheading the organic farming movement in the area (Adams et al, 2020). The ability of the aquifer to recharge is also impacted by linearized stormwater systems, which channels fresh rainfall away from the area and out to sea (Malan, 2014). This degenerative system needs to be reversed in order to safeguard the aquifer by means of more circular and regenerative stormwater management systems, such as Sustainable Urban Drainage Systems (SUDS)[86]. In addition to this, the quality of the groundwater is currently under threat due to poor stormwater management infrastructure in the area (CoCT, 2009; observations from PHA ACT meeting, 2021).

iv) Food security and sovereignty

Historically, the PHA was the primary source of the CoCT's fresh produce (Horn, 2020:584). Presently, the PHA provides between 50 and 80% of the City's fresh produce and as such has come to be known as the 'breadbasket of Cape Town' (Kemp, 2020:54). The productivity of the PHA can be attributed both to the availability of water provided by the CFA as well as historical 'no tilling' farming methods which enriched the soil over time since the area was first farmed in the early 1800s (Kemp, 2020:56; Govenfer & Mammon, 2020:103). In addition to this the area has a microclimate which keeps it cooler than its surrounds, enabling continued productivity in the hotter months of the year (Taylor, 2013). According to the CoCT, the PHA farmlands are "by far the most productive per hectare" farms in South Africa (CoCT, 2012). Thus, Indego Consultants (2018) conclude that "The PHA growing conditions are not replicable within a 120 kilometer radius of Cape Town."

In 2010, there were 53 farmers operating in the PHA, 18 of which were larger-scale commercial farms, whilst the other 35 were emerging small-scale farmers (Erasmus, 2010). The small-scale farmers are pioneering more regenerative agricultural practises which is necessitated by their small plot sizes, as discussed in Chapter 2 (Adams et al, 2020). In addition to this, as indicated on Figure 31 below, the emerging small-scale farmers represent a more racially diverse group

[86] SUDS are alternative stormwater drainage systems which mimic the natural water cycle (Armitage et al, 2013). For example, open vegetated channels can be utilized to manage runoff, allowing infiltration and groundwater restoration in the process (ibid).

than the commercial farming sector in the PHA, which is dominated by white farmers. This group of farmers thus represent and enable greater food sovereignty among the local community. The emergence of PoC aspirant small-scale farmers also supports the argument put forward previously that small-scale farming in the PHA can enable agrarian land reform efforts. This is bolstered by the fact that, according to Indego Consultants (2018), many of the white commercial farmers are ageing, and few have children interested in continuing to farm in the PHA. Thus, since these commercial farmers are reportedly looking for an 'exit strategy', their land can be made available to emerging small-scale PoC farmers (ibid). Current land reform efforts nationally have focused on large-scale, commercial farms in far-flung rural areas (Cousins, 2018). As a result, agrarian land reform efforts have seen few beneficiaries and these commercial farms are either difficult to operate for new farmers or are captured by elites (Cousins, 2016). Thus, small-scale agriculture needs to be given more attention in South Africa's land reform efforts. As argued by Cousins (2018), " urbanisation and growth of informal settlements, some on communal land in peri-urban areas, mean that...A key spatial focus for smallholder-oriented land reform could be redistribution near to towns and cities, close to growing urban informal food markets."

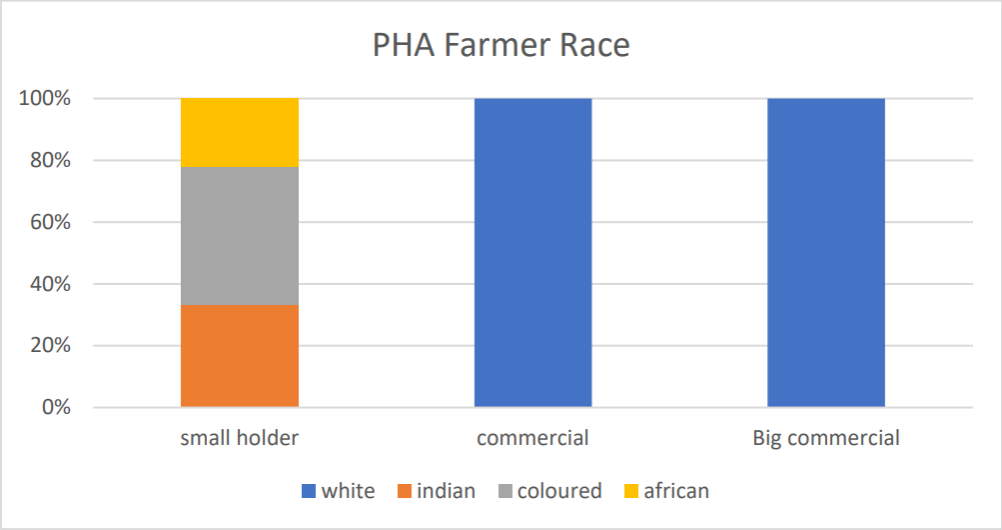


Figure 31: PHA farmer profile according to race[87].

Importantly, produce from the PHA filters into a diversified supply chain, from large commercial supermarkets to spaza shops and local informal traders (Battersby-Lennard & Haysom, 2012; Swart, 2012). As such, the area improves access to nutritious food across income groups. Farm workers also benefit from improved food security, since over 2000 tons of produce is given for free to workers annually, with each worker being given approximately 2-5 kilograms of vegetables daily (ibid; CoCT, 2009). The fact that the PHA is embedded in the city drives the cost of food down and reduces carbon emissions, as there is no need to transport produce across far distances (Swart, 2012). As such, the produce that comes from the PHA is essential for food security and climate change resilience (ibid).

[87] Source: Indego Consultants, 2018.

Fig 32: informal traders sell fresh produce in Philippi Industria. Author's own

v) Biodiversity

The high water table in the PHA gives rise to an abundance of wetland ecosystems[88] which provide essential habitat for biodiversity (SAFCEI, 2017; Swart, 2013). These wetlands are indicated on Figure 33, and support approximately 98 bird species (van der Merve, 2016). Belts of sensitive coastal dunes and threatened Cape Flats sand fynbos and Cape Flats dune strandveld can also be found within the area (Battersby-Lennard & Haysom, 2012). As indicated on Figure 33, the south-east quadrant of the PHA is characterized as a Critical Biodiversity Area (CBA), which are "...areas which must be safeguarded in their natural or near-natural state because they are critical for conserving biodiversity and maintaining ecosystem functioning" (SANParks, n.d). This is due to the sensitive dune systems, wetlands and vegetation that exist in this part of the PHA (CoCT, 2007).

[88] Approximately a third of the PHA is seasonal wetland (SAFCEI, 2017).

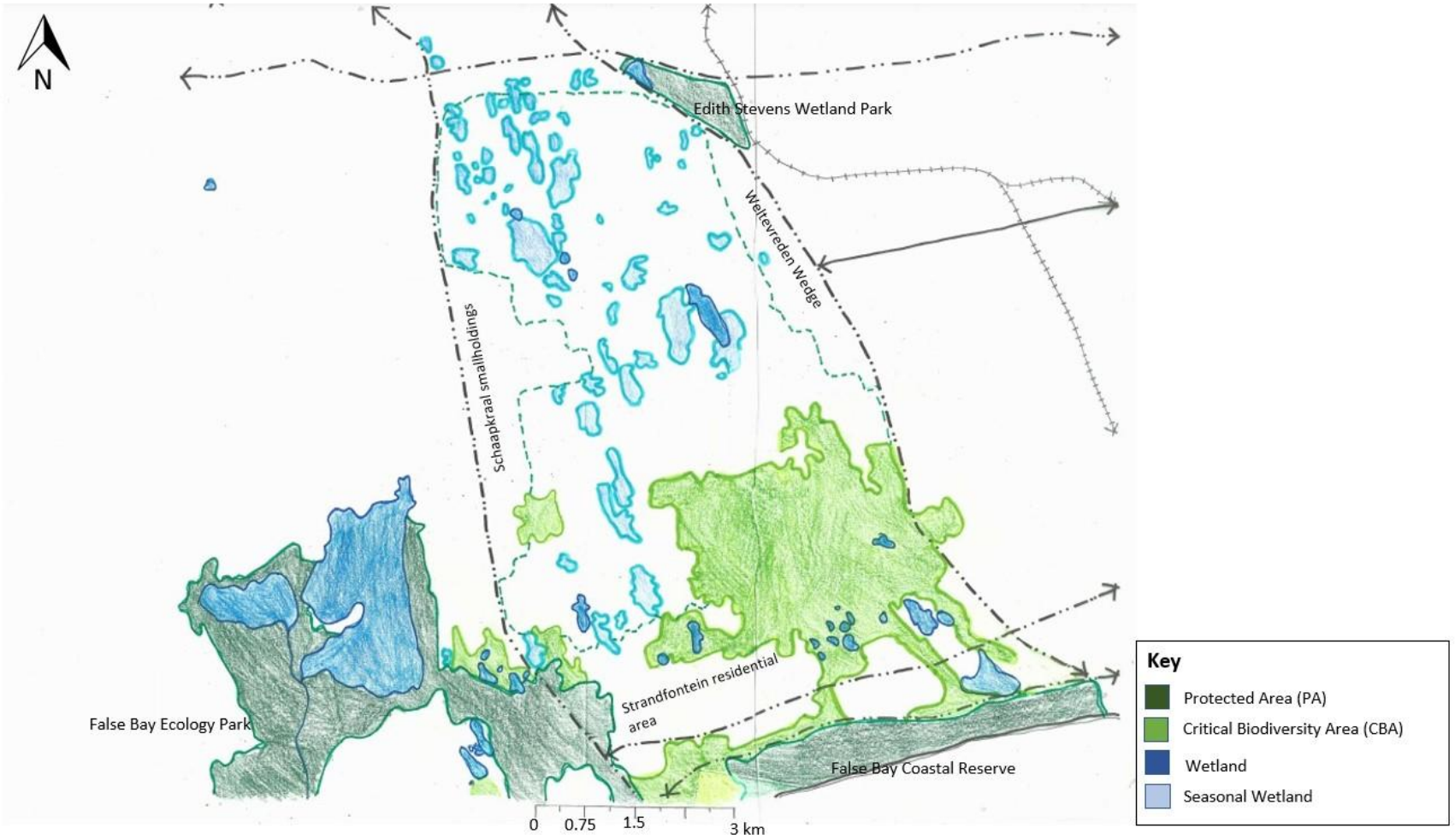


Figure 33: Ecological assets within the PHA.

3.3.3: Planning efforts to safeguard the PHA

According to Indego Consultants (2018), historically there was a "broadly held policy consensus" that the PHA should be protected from urban development and retained for horticulture and sand mining. This is indicated on Figure 35, which displays a timeline of planning protections and land use in the PHA. The various stages where the CoCT acknowledged the importance of the PHA as agricultural land, and hence the need to safeguard it, are outlined in red on Figure 35. However, since 1988 a series of planning decisions have over time diminished the core PHA footprint, as indicated on Figure 34 (ibid). For example, since 2001 there have been sixteen minor edge amendments to the PHA, and two large scale proposed amendments (the Oakland City and UVest developments, indicated on Figure 35 and 19 (Horn, 2020:582). This has led to the gradual erosion of the footprint of the PHA indicated on Figure 34, despite the acknowledgement of its immense value by decision-makers on various occasions over time.

Figure 34: the reduction of the PHA footprint over time due to a series of planning decisions[89].

[89] Source: Indego Consultants. 2018. (Image). *Building the City of Cape Town's Resilience and Adding to Regional Competitiveness. Philippi Horticultural Area: Socio-Economic Agricultural Plan.* Available: https://www.elsenburg.com/sites/default/files/PHA%20Socio-Economic%20Agricultural%20Plan%2004%20June%202018.pdf [2021, August 14].

Figure 35 (below, P82-87): timeline indicating land use and planning protections in the PHA. Author's own.

Pre-Colonial Era

The PHA was used by indigenous hunter gatherers over millennia. Over 2000 years ago, the PHA was used as grazing grounds by Khoi hunters.

Colonial Era (1650-1948)

1800s: The first local community of residents is recorded in 1833, most of which were from the former Ciskei and Transkei (Adlard, 2009).

German settlers also began to farm in the PHA in the 1830s (Asmal, 2016)

*A historic farming community in the PHA, **1899**. (Source: CoCT, 2007).*

The colonial government aimed to support the early PHA farmers in establishing the Cape Flats as the "Vegetable Pantry of Cape Town" (Indego Consultants, 2018)

1920s: Suburbanization began in the area around the PHA

Apartheid Era (1948-1994)

"In South Africa, of course, during the apartheid days it was forbidden for the black majority to grow food on land within and around cities, because that meant people were there to stay." (Girardet, 2015:116).

Source: Selplan, n.d.

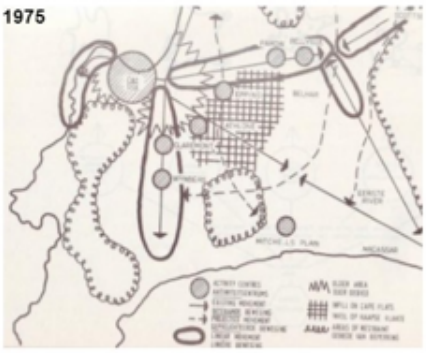
1967: the PHA is designated for horticulture and sand mining in terms of the Physical Planning Act

Philippi East was rezoned from an agricultural to an industrial zone to accommodate this

1970s-1980s: the PHA footprint is reduced by more than half as Black South Africans are forcibly removed to the Cape Flats area in terms of the Group Areas Act (1950). Whilst the adjacent settlement of Nyanga was established in earlier years, Mitchells Plain and Philippi East were established in proximity to the PHA during this period, due to mass forced removals from District 6 in the late 1960s (Indego Consultants, 2018).

Philippi East rezoned from farming to industrial land use in order to establish an industrial node (Olver, 2019). The PHA footprint is further reduced.

1975



1975 Cape Metropolitan Area Guide Plan identifies the PHA as an 'area of restraint', where urban growth should be limited
Source: Asmal, 2016

1978

Map indicating mineral resources in Cape Town, 1978. Source: Asmal, 2016

1988

988 Cape Metropolitan Area Guide Plan

Cape Metropolitan Guide Plan of 1988 reserves the PHA for silica mining and horticulture, thus restricting urban development in the area (CoCT, 2012). The reserved area is a reduction of the original area reserved in 1967 (ibid).

1993

The first informal settlements, Jim se Bos and Egoli emerge on the western edge of the PHA- what is now the Schaapkraal area (Swart, 2012). Most residents are people evicted from council houses in the Cape Flats (ibid).

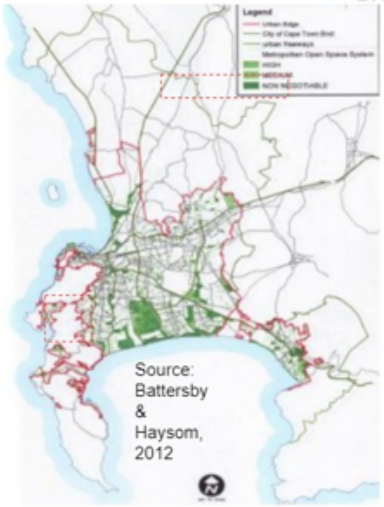
Post-Apartheid Era (1995-present)

Rapid urbanization and change brings an era of significant development pressure. A number of informal settlements emerge on the edge and rezoning applications are put through, allowing for urban development. It is estimated that in the present, approximately 10% of the original farmland remains (PEDI, n.d).

1996

1996 Draft MSDF indicates an urban edge around the PHA

2003



The PHA is earmarked as open space which is 'non-negotiable' for development in the 2003 MSDF Review (Battersby & Haysom, 2012)

2008

Schaapkraal Civic and Environmental Association (SCEA, now the PHA Campaign) established

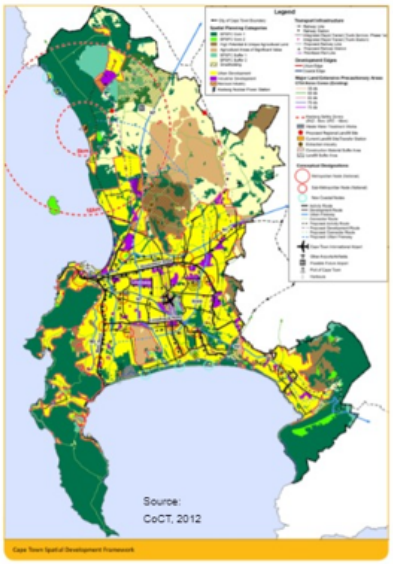
2009

PHA urban edge amended: Weltevreden Wedge earmarked for farmworker housing (Sonday, 2019).

First application put through to develop the south-east quadrant (Oakland City). CoCT recommends this application is rejected (Shoba, 2020).

2011
Oakland City application approved by the provincial minister of planning, despite the CoCT's recommendation in 2009 (Shoba, 2020). The application was also opposed by the national minister for Agriculture (Olver, 2019). The approval amended the CoCT MSDF to move the urban edge, but did not yet confer any development rights as a rezoning still needed to occur (ibid).

2012



The 2012 CoCT MSDF delineates an urban edge around the PHA and states that " "To promote food security and mitigate food price increases, the City should...consider having 'high-potential and unique agricultural areas'...declared as agricultural/cultural landscape by the highest appropriate level of authority; investigate ways in which all agricultural areas of significant value...could receive local protection (over and above the urban edge)" (CoCT, 2012:65).

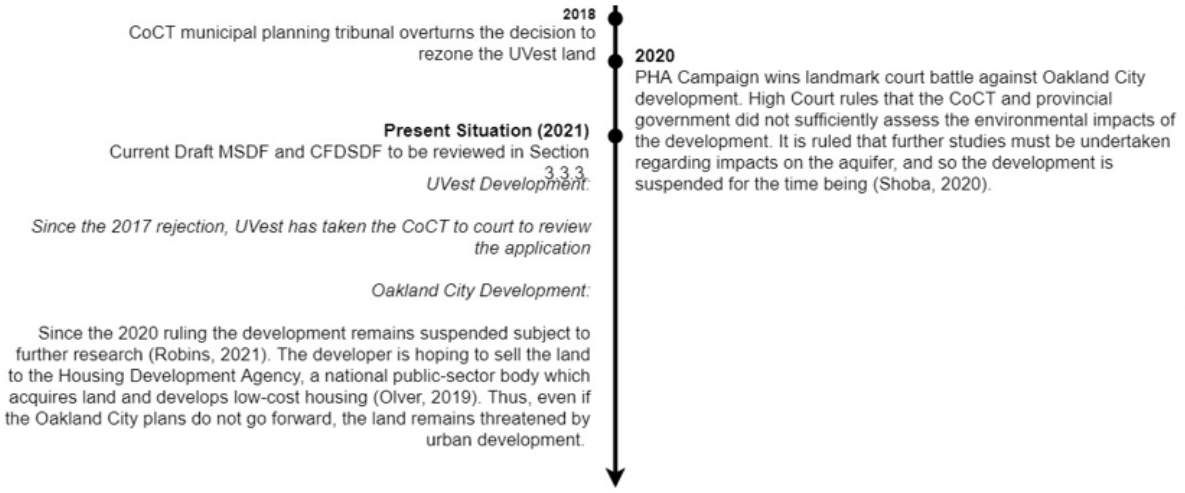
However, the UVest land is excluded from the urban edge, hence designating the area for urban use (Olver, 2019).

2015
PHA Campaign established following the dissolution of the SCEA

2016
UVest rezoning application put through for the south-west quadrant of the PHA (Isaacs, 2017). Rejected by Heritage Western Cape, but this is not binding as the CoCT can still approve the development (van der Merwe, 2016).

2017
Second appeal by UVest to rezone the south-west quadrant rejected by Heritage Western Cape

PHA Campaign appeals against the rezoning for Oakland City but loses (Olver, 2019).



The reduction of the PHA footprint over time (Figure 34) despite a long-standing policy commitment to protecting (Figure 35) indicates the gap between policy and implementation discussed in Chapter 2. Clearly, the land use planning protections and policies with regards to the PHA have fluctuated significantly over time, and have failed to meet their purpose of safeguarding the PHA for agricultural use. According to Govender and Mammon (2020:108), "Various studies and spatial frameworks have been undertaken to inform the role of the PHA. However, none of these to date have clarified the PHA's long-term roles relative to the pressure for urban development". This lack of a single, clear vision and policy for the PHA has aggravated the continuous friction between the various stakeholders in the conflict regarding the future land use of the PHA (Indego Consultants, 2018). The following Sections aim to delve into the current spatial planning documents with regards to how they manage and plan for the PHA. To this end, the 2018-2022 MSDF and the most recent Draft Cape Flats DIstrict Plan (CFDP), published for public comment early in 2021, will be critically analysed.

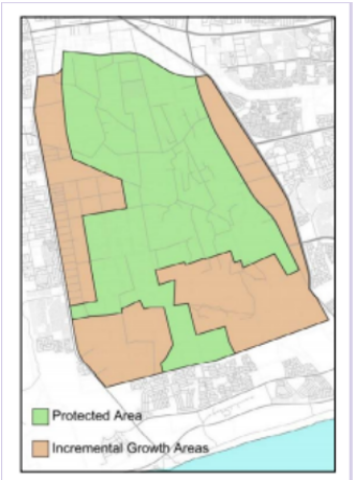


Figure 36i: the PHA in the 2018-2022 MSDF

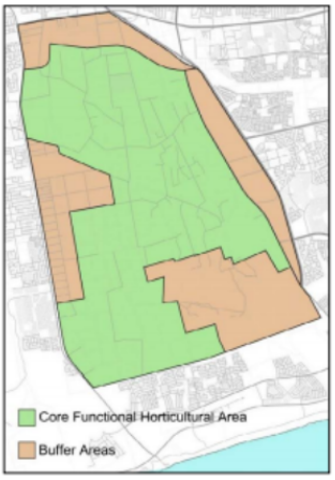


Figure 36ii: the Western Cape Government PHA Socio-Economic Agricultural Plan (2018)

3.3.3.1. The 2018-2022 MSDF- a critical analysis

As mentioned previously, top-down spatial planning for the PHA has been riddled with complexity and contradictions. Govender and Mammon (2020:109) utilize the most recent MSDF (2018-2022) and the Western Cape Department of Agriculture's PHA Socio-Economic and Agricultural Plan (2018) to illustrate this spatial development uncertainty and the lack of policy alignment between decision-makers. This is indicated on Figures 36i and 36ii. Clearly, local and provincial governments are misaligned in

terms of what should be the 'core' part of PHA farmland to be protected in the long-term, and where urban development should take place. Due to the decision-making complexity with regards to mandates over agricultural land, as discussed in Section 3.2.2, room is created for disagreement and conflict, and developers are given more opportunity to convince decision-makers to approve proposed amendments to agricultural protections. As indicated on Figure 36i, the controversial south-east and south-west quadrants of the PHA are excluded from protection in the current MSDF, and are earmarked for incremental growth. This sets a dangerous precedent for the further reduction of the farmlands.

Delving more deeply into the current CoCT MSDF spatial plan, indicated on Figure 37, reveals further flaws. This MSDF does not include reference to an urban edge policy and instead uses the concept of Transit Oriented Development[90] to motivate for the containment of urban sprawl (Horn, 2020:589). As indicated on Figure 37 overleaf, the urban edge is not delineated, and instead the present metropolitan boundary is indicated. This is despite the fact that a coastal edge is still delineated. According to Spatial Planner 1, any reference to 'urban edge' in this MSDF was "scrubbed out"[91] primarily due to the political controversy[92] of the earlier amendments to the edge for the Oakland City and UVest developments. When the draft version of this current MSDF was circulated, the lack of a clear urban edge received twenty five objections and only one positive comment from the Provincial Department of Human Settlements (Horn, 2020:589). Despite this widespread discontent, the current MSDF was approved.

[90] TOD is a spatial planning concept which focuses on using densification and mixed land uses to create walkable cities (Bickford, 2016).
[91] Former mayor de De Lille was quoted to have said "I don't want to see that word (the urban edge) again."
[92] This controversy is documented in detail in the book *A House Divided* by Crispian Olver (2019). The controversy largely involves the Mayor at the time of the PHA amendments, Patricia de Lille, and her support for developments which contravened the public interest during her term, despite the objections of planners in the CoCT planning department.

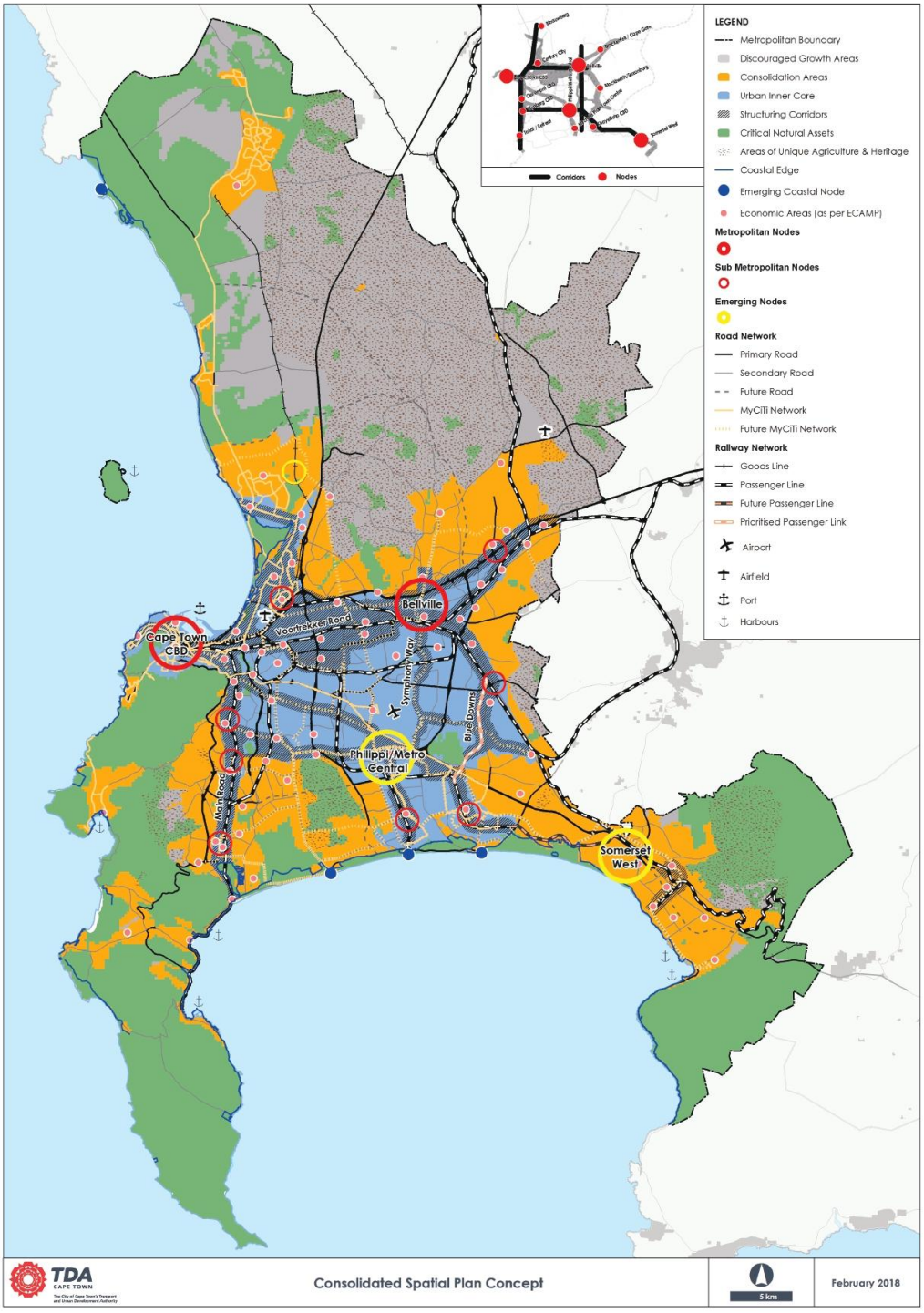


Figure 37: the 2018-2022 CoCT MSDF. The PHA is highlighted[93].

[93] Source: adapted from CoCT, 2018b.

In terms of the PHA's cultural and heritage value, the current MSDF designates the area as a 'proposed heritage area', but does not take this further by imposing a Heritage Protection Overlay Zone (HPOZ) as it has done for heritage sites closer to the city centre (CoCT, 2018b). This suggests that perhaps the PHA is valued less than wealthier heritage areas due to its location in the low-income Cape Flats. The MSDF also designates the 'core' PHA as a 'Critical Natural Area', but excludes the Oakland City and UVest land areas from this designation (Indego Consultants, 2018). This is concerning since, as indicated in Section 3.3.2, this portion of the PHA is a CBA which indicates that this area is of critical importance to biodiversity and ecosystem functioning. However, the designation of the 'core' PHA as a 'Critical Natural Area' is encouraging, since these areas are defined as "...areas that contribute significantly to the City's future resilience and/or have protection status in law." This represents a commitment by the City to protect the 'core' farming area, at least in the present. The current MSDF also identifies the PHA as a 'unique area', and as such is provided with specific land use guidelines, indicated on Figure 38 below. It is characterized as a unique area due to its importance for food security at a metropolitan scale and its importance for the recharge of the CFA.

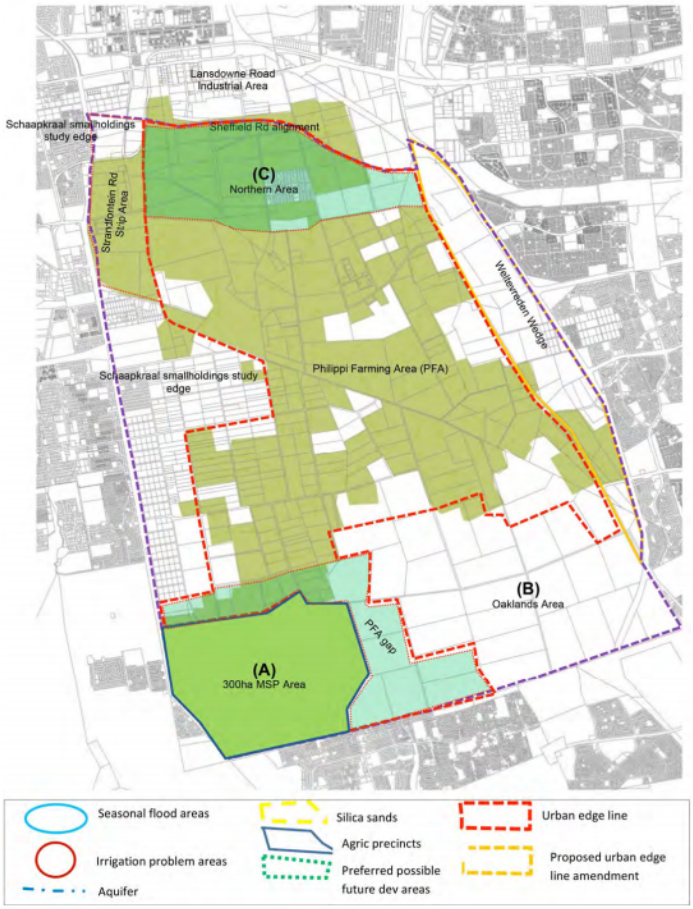


Figure 38: Specific guidelines for the PHA contained in the current MSDF (2018-2022)[94].

[94] Source: CoCT. 2018b. (Image). *Municipal Spatial Development Framework.* Available: https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies%2c%20plans%20and%20frameworks/CT_Metropolitan_Spatial_Development_Framework.pdf [2021, August 17].

Areas A and B on Figure 38 are excluded from the urban edge protection line, indicating a move by the City in support of the controversial UVest and Oakland City developments. However, as indicated in Section 3.3.2, this southern portion of the PHA is the most critical aquifer recharge zone, and thus allowing for urban development to occur here will be deleterious to Cape Town's water security. Additionally, in a detailed study of the PHA, Indego Consultants (2018) concluded that this portion of the PHA also harbours the highest agricultural potential, thus these guidelines are also harmful to the City's future food security. Thus, the guidelines for the PHA in the MSDF seem to contradict the very intention for designating it as a unique area in the first place. As indicated on Figure 37, the areas which fall outside of the 'core' farming area (referred to as the "Philippi Farming Area" in Figure 38) are defined as 'Consolidation Areas.' These areas are earmarked for new development, subject to infrastructure capacity (CoCT, 2018b). This differs significantly from 'Discouraged Growth Areas' (DGA) and 'Critical Natural Areas' (CNA), which designate land areas which should be protected from development. As such, the 2018 MSDF seems to be committed to developing the southern portion of the PHA, despite various studies commissioned by the CoCT itself indicating that this land is essential for both food and water security purposes and despite the legal challenges currently in progress. Additionally, this sets a worrying precedent that other 'core' farming areas of the PHA could be subject to the same change in the future, as the historical whittling down of the PHA indicated on Figures 34 and 35 have shown.

However, Policy Statement 26 of the MSDF states that the City should "Protect valuable agricultural areas, viable farmed areas and horticultural areas from urban encroachment, and support urban agriculture." In this, it is recommended that further subdivision of properties in the PHA should be avoided (CoCT, 2018b). This refers to the area identified as the "Philippi Farming Area" (PFA) on Figure 38. Despite this policy commitment, however, Section 3.3.4 will explore how policy commitments are often not followed through on in implementation. This is likely to occur in the areas of the PHA where the policy is ambiguous, such as Area C on Figure 38, where it is stated in the MSDF guidelines for the PHA that whilst this area is currently included in the 'core' farming area (or PFA), this may be amended in the future subject to further investigation.

3.3.3.2. The 2021 CFDP- a critical analysis

The most recent Draft Cape Flats District Plan (CFDP) was published in April 2021 for public comment and review. In terms of the policy stance regarding the PHA, its importance is recognized mostly in terms of its economic value (CoCT, 2021). The PHA 'core' is identified as an 'Agricultural Area of Significance' and as such is subject to various guidelines, including the discouragement of development and sub-division. The CFDP notes that in this area, the City should "Limit non-agricultural uses to ancillary rural activities that do not detract from the primary agricultural use and character of the area, but contribute to local character and associated recreational and tourism potential" (CoCT, 2021). The PHA is also identified as a 'destination place', indicating a move among policymakers towards placemaking and celebrating the character of the area.

The spatial expression of the CFDP is indicated on Figure 39 overleaf. Importantly, the Oakland City land on the south-east quadrant of the PHA is earmarked as a ‘New Development Area’ and is excluded from the protection of the urban edge. This is despite the importance of this part of the PHA for water security, food security and biodiversity, as previously discussed at length. Additionally, the CFDP itself recognizes the southern parts of the PHA as an important buffer for the wetlands in the PHA and the Lotus River to the west of the PHA in aid of flood risk mitigation and infiltration capacity (CoCT, 2021). Therefore, earmarking this space for new development is a clear policy contradiction. The inclusion of the UVest land in the area designated as an ‘Agricultural Area of Significance’ also contradicts the 2018 MSDF, which designates this land for ‘Incremental Growth.’ This reiterates the argument put forward previously that spatial planning for the PHA is riddled with complexity and ambiguity, which renders the land vulnerable to development encroachment.

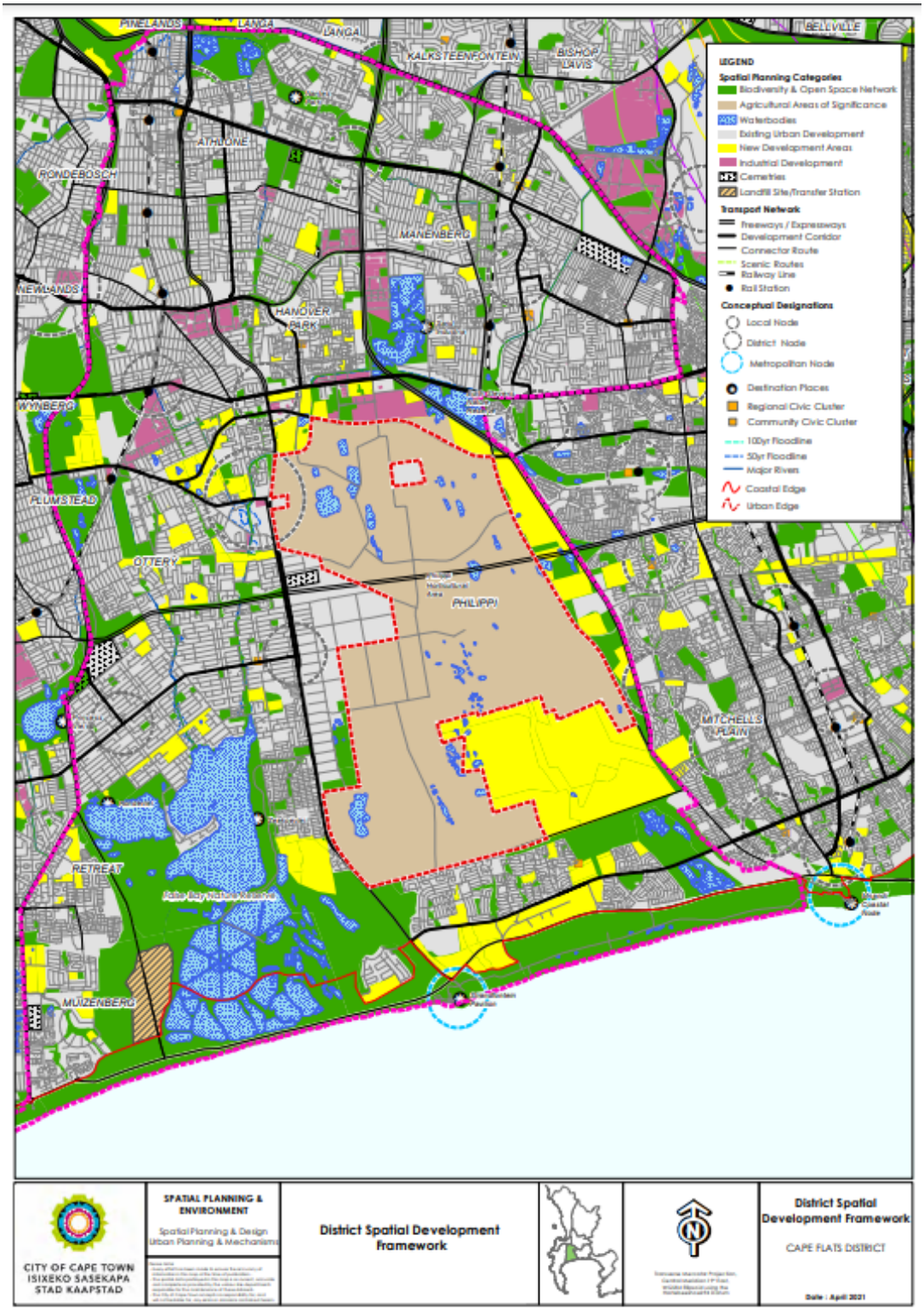


Figure 39: The 2021 CFDP[95]

[95] Source: City of Cape Town (CoCT). 2021. *Cape Flats integrated district spatial development framework and environmental management framework.* Available:

Figure 39 also indicates the controversial proposed extension of the R300 freeway through the 'core' farming area previously mentioned. This is in order to improve east-west mobility linkages through the City, since the PHA forms a large barrier against rapid movement along this axis (CoCT, 2012). According to Indego Consulting (2018), many farmers in the PHA have expressed concern that this will severely impact the viability of their farming operations due to the urban externalities and pressures that high volume traffic will bring. The CFDP tries to mitigate these concerns by stating that the R300 freeway should "...not include any direct access to the PHA which encourages a subsequent urban development response in the PHA. Instead, the extension should include sufficient underpasses in support of retaining a functional horticultural area both north and south of it" (CoCT, 2021). In addition to the proposed R300 extension, there has also been an ongoing commitment from the Passenger Rail Agency of South Africa (PRASA) to extend the railway line through the PHA, which may pose similar threats to the R300 extension (Setplan, 2018).

3.3.4: Issues facing the PHA despite spatial planning and policy efforts

Despite various policy statements and spatial plans put forward by the City in recognition of the PHA's importance, the area remains characterized by conflict and uncertainty. According to Govender and Mammon (2020:99), "The PHA is undeniably one of the most hotly contested parts of Cape Town." As previously mentioned, the PHA is subject to intense development pressure due to its well-locatedness and the housing need in the City. This pressure has manifested through an increasing amount of requests for zoning changes and land use departures in the PHA in order to convert agricultural land to urban use (Battersby-Lennard & Haysom, 2012). In addition to this, other urban externalities such as illegal land use and crime are impacting on the area's productivity due to its spatial vulnerability to urban pressures. As a result, the area is riddled with uncertainty with regards to its future (CoCT, 2007). This confirms the argument put forward in Chapter 2 that the urban-rural interface is a space of immense complexity. The issues in the PHA are seriously affecting the CoCT's potential for a regenerative future due to the importance of the area for food and water security as well as the sensitive biodiversity it harbours, set out in Section 3.3.2 (CoCT, 2007). The following subsections aim to outline and unpack these challenges facing the PHA in order to contextualise and inform the intervention put forward in Chapter 4.

i) Poor spatial planning

The lack of proactive spatial planning for defining and defending the urban edge, as described in Section 3.3.3, has resulted in an unclear distinction between the abutting urban area and the horticultural area (iKapa Enviroplan & City Think Space, 2013; CoCT, 2007). This is indicated on Figure 40 below, where the high density commercial area of Ottery East on the western edge of the PHA is separated from the farmlands by Strandfontein road, with no gradual and legible spatial transition between urban and rural land.

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https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies%2c%20plans%20and%20frameworks/Cape_Flats_Draft_IDSDFandEMF_Technical_Report.pdf [2021, August 19].

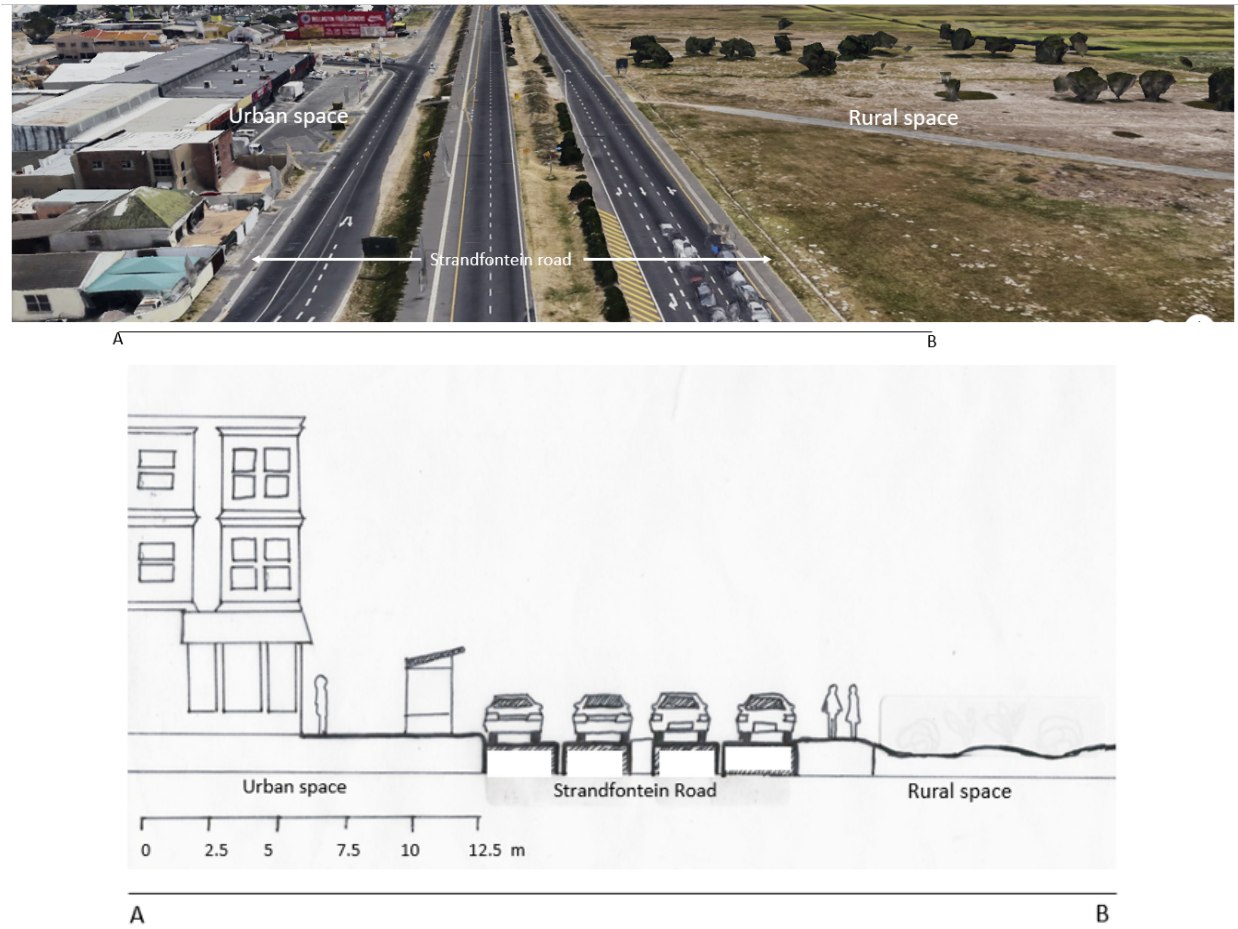

Figure 40: perspective and cross-section indicating the lack of a transition space between the urban and the rural at the edge. Source: Google Earth Imagery (perspective), Author's Own (cross-section).

As argued in Chapter 2, this lack of clear spatial definition reduces the urban edge to a 'line' that is easy to cross, and makes the urban-rural interface an ambiguous and confusing 'non-place' where illegal land uses and incremental encroachments are able to pass undetected. Beyond this, this lack of proactive planning misses an opportunity to create an active urban-rural interface where people can connect with the origins of their food and with nature. There are no clear management guidelines for the 'zones' on either side of the urban edge line as recommended by the CoCT Development Edge Policy (2009) in either the current MSDF or the current draft CFDP. This results in an unstructured urban form on the edge of the PHA (iKapa Enviroplan & City Think Space, 2013). This was corroborated in Focus Group 1, where participants argued that the lack of definition between urban and rural along the edge results in a slow encroachment of non-conforming land uses and speculation.

An additional issue with the spatial planning and urban design approach in the area is a lack of proactive promotion of local character. For example, historically treed avenues[96] within the PHA have been transformed into urban roads with high traffic volume, and little provision for Non-Motorized Transport (NMT) has been made. Figure 41 below indicates the character of an internal road within the farmlands.

Figure 41: *Schaapkraal Road within the PHA indicates the character of internal roads within the PHA.* Source: Author's site photography.

The result is a "...loss of local streetscape and 'place-making elements'" (iKapa Enviroplan & City Think Space, 2013). In addition to this, the area's historic farmhouses (such as the Sonnenstrahl farmhouse indicated in Figure 25) are not celebrated and used to upgrade the surrounding landscape, and as such are subject to vandalization (CoCT, 2007). Overall, the PHA is largely invisible to Cape Town residents[97] despite the fact that it provides a large amount of their daily produce (Spatial Planner 1, personal communication). As articulated by iKapa Enviroplan and City Think Space, "Currently knowing where to enter the PHA and how to safely experience ongoing food production in the heart of the city is confusing."

Despite the significant scenic quality and heritage resources which exist in the area, discussed in Section 3.3.2, these resources have not been celebrated and enhanced through strategic spatial planning and urban design. Arguably, this lack of visibility in the area contributes to its

[96] Rows of trees abutting farm properties and along road edges are a distinctive part of the character of the area, and were used historically as windbreaks (CoCT, 2007).
[97] This is corroborated by my personal experience as a researcher in the PHA. In speaking to peers outside of the planning discipline, it is astounding how few Capetonians know that the PHA even exists. This stands in stark contrast to the well-known Oranjezicht City Farm, which provides upmarket Cape Town residents with organic produce at a trendy and popular market in the City Center.

constant degradation and misuse, and misses an opportunity to stimulate local economic development through sustainable agri-tourism and to create a vibrant green space for residents in the adjacent areas to enjoy (Indego Consulting, 2018). The area is thus currently underappreciated and disconnected from the rest of the City due to poor spatial planning. Figure 42 indicates the western edge of the PHA and exemplifies the lack of an active urban-rural interface. The back end of walled residential properties face onto the farmlands, hence creating a deadened public environment.

Figure 42: a 'deadened' urban-rural interface. Source: author's site photography.

ii) Political and decision-making issues

According to interviews undertaken by Horn (2020:592) with CoCT spatial planning officials, "One of the most cited challenges to the CoCT urban edge is the political interference in enforcing the policy." The Oakland City and UVest development applications have precipitated the highest profile and most politically charged amendments to the PHA urban edge (Horn, 2020:584; Olver, 2019). As indicated on Figure 35, the Oakland City urban edge amendment occurred in 2011, and was initially not supported by the CoCT. However, this was superseded by an approval from the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) (Horn, 2020:584). The provincial minister of Planning also approved the amendment to the urban edge on the CoCT MSDF despite objections from the national minister of Agriculture (Olver, 2019:101). The political uncertainty has been similar for the UVest property. The 2012 application to amend the urban edge for the development initially faced major objections and as such the decision was deferred by the CoCT mayoral committee until further studies could be undertaken (Horn, 2020:585). However, this commitment was rescinded by the CoCT council and the urban edge amendment was supported in 2013 (ibid). This illustrates the issues created by decision-making complexity and a lack of clarity regarding political competencies in terms of planning for agricultural land in the City, as outlined in Section 3.2.2.

According to Horn (2019:970), the inconsistency in implementation of the urban edge can be partly attributed to unsupportive political leadership. As is often quoted, former CoCT Mayor Patricia de Lille claimed in 2013 that “the urban edge is an artificial barrier...which can be moved or amended as needs require” (ibid). According to Dewar et al (2013), de Lille’s characterization of the urban edge is misinformed since, “The very role of an urban edge, the demarcation of which must be based on careful analysis (it is far from arbitrary), is dependent upon it being, at worst, very long-term and, at best, permanent.” Thus, a deep issue with planning policy being overseen and implemented by politicians is a lack of understanding on the part of these individuals of spatial planning dynamics and intricacies. According to Horn (2020:590), interviews with CoCT spatial planning officials revealed a “...deep commitment to the urban edge as a policy instrument.” This is contradicted by a “..political climate (that) is much more in favour of developer-led planning” (ibid). As such, the PHA conflict manifests in the political sphere as a conflict between the public interest ideals of planners and the short-term political goals of government decision-makers. For example, when the MSDF was amended in 2012 to allow for the Oakland City development, as indicated on Figure 35 (the timeline), the CoCT went against the recommendations of its own Department of Spatial Planning and Urban Design (Olver, 2019:105). In fact, Olver (2019) documents how often, planning officials are ‘bullied into’ signing off on spatial planning decisions despite not supporting them.

According to Spatial Planner 1, this political complexity comes down to the lucrative land market, stating that “...the higher the prices of land, the more contestation there will be” (personal communication, 2021). As discussed in Chapter 2, the increased rates and taxes which can be gained from rezoning agricultural land to urban use motivates decision-makers to relax land use protections and contradict long-term social and environmental needs. A participant in Focus Group 1 claimed that City officials avoided sharing development applications regarding urbanizing the PHA with the PHA Campaign in a direct attempt to minimize dissent and push developments though. This deep political maladministration is captured in a comment made by a private developer interviewed by Horn (2020:590), who stated that “...if you have a friend in the Mayor’s office, your chance of getting an urban edge amendment is almost guaranteed.” This was corroborated by Olver (2019:102), who argued that former CoCT mayor Patricia de Lille may have supported the Oakland City development to gain political clout since the development was funded by trade union-linked pension funds. Figure 43 indicates the magnitude of the Oakland City development if it is to go through. The development entirely contradicts the character of the PHA, and is clearly not sensitive to the ecological complexity of the land. Despite this, City officials have been supportive of the development.

Figure 43: Urban design concept for the Oakland City development[98].

In addition to this, political complexity in the PHA relates to the idea of 'conflicting ways of knowing' or 'competing needs' put forward in Chapter 2. According to Battersby-Lennard and Haysom (2012), the PHA conflict has become "...fraught with tension as the various stakeholders are generally able to each argue, with supporting facts and data, for a decision that is oriented towards their specific need." At its core, the political contestation in the PHA hinges on the fact that different values result in different framings of the same issue, and on the fact that information can be used selectively in order to push certain narratives (Horn, 2020:579, van der Mervwe, 2016; Battersby-Lennard & Haysom, 2012). Due to the subjectivity of ascribing value, the PHA has been characterized completely differently by stakeholders. For example, in 2013 former mayor Patricia de Lille claimed that farming in the PHA was decreasing due to high crime levels, illegal dumping and informal settlement occupation (Horn, 2020:586). On the contrary, Battersby-Lennard and Haysom (2012) found that productivity in the area is increasing and that emerging small-scale and commercial farmers are investing significantly in the land and in improving infrastructure. The idea of conflicting ways of knowing as discussed in Chapter 2 comes down to how different competing needs are valued relative to one another. In Focus Group 1, it was argued that the City does not celebrate or see the value in horticulture as it does with viticulture, due largely to the more lucrative and high end market which the viticulture space caters to. As such, it was noted that "we have a wine route, but we don't have a vegetable route" (Focus Group 1, 2021). This links back to the previous discussion regarding how current spatial planning approaches do not celebrate or enhance local character in the PHA.

This dynamic of competing rationalities and interests is intensified by the siloization within governance and decision-making structures, where the priorities of housing and economic development officials come up against the sentiments and values of ecological and heritage planners (Knight, 2019). This fragmented decision-making approach also contradicts the ideas

[98] Source: Greater Cape Town Civic Alliance. 2016. (Image). *GTCA formally objects to development on the PHA.* Available: http://gctca.org.za/gctca-robustly-and-formally-objects-to-development-on-the-philippi-horticultural-area-pha/ [2021, October 29].

put forward in Chapter 2 that "...issues related to food security, environmental well-being, and access to land and development are inextricably linked and cannot be dealt with in isolation" (Govender & Mammon, 2020:98). The severe backlog in the availability of affordable and well-located housing intensifies the pressure that the PHA is subject to, according to Spatial Planner 1. The City has pushed the narrative that safeguarding the PHA through restricting development is detrimental to the provision of well-located social housing, despite reports that they have commissioned themselves stating that the area is largely unsuitable for low-cost housing due to the high water table (Indego Consulting, 2018). As previously mentioned, the promise of low-cost housing has been used by both the Oakland City and UVest developers to push through their development applications (Olver, 2019:103). According to Spatial Planner 1, however, the 'hearts are in the right place' in terms of arguing for housing in the PHA, and is merely the result of decision-makers trying to contend with extreme pressures in a rapidly urbanising context.

The CoCT's decision-making approach when it comes to the future of the PHA therefore coheres with the trade-off approach which is ingrained within the traditional sustainable development narrative, as discussed in Chapter 2. As put forward in Chapter 2, the conventional understanding of human and environmental needs as mutually exclusive creates this tension at the core of complex planning issues such as that of the PHA, where competing needs come into direct conflict. The political pressure to provide housing, economic growth and basic needs in the post-apartheid era results in decision-making that privileges short-term social and economic development over environmental protection, as discussed in Section 3.2.2. If this trade-off narrative continues to prevail, it is likely that the PHA will continue to be a space of intractable contestation, where the only solution is a 'winner-takes-all' arrangement where either development or conservation are prioritized (Govender & Mammon, 2020:123). Thus, the intervention put forward in Chapter 4 aims to mediate this conflict by taking inspiration from theories of regenerative development as discussed in Chapter 2. This involves seeing beyond binaries, and implementing solutions that enable symbiotic relationships between people and the environment. Through this, as argued by Govender and Mammon (2020:123), "...urban and agricultural land uses can co-exist in a mutually supportive manner."

Figure 35 (the timeline) provides further insight into the decision-making approach in terms of managing the future of the PHA, which largely reflects the issues discussed in Section 3.2.2. The diminishment of the PHA footprint over time has been enabled by incremental decision-making which considers only site-level impacts and benefits without cognizance of cumulative or long-term impact. This is illustrated explicitly on Figure 34 in Section 3.3.3. According to the PHA Campaign's comments on the 2021 Draft CFDP, when decisions were taken in 2009 to amend the urban edge in order to allow for the Oakland City construction, the language of climate change and its long-term impacts was not yet politically popular (PHA Campaign, 2021). It was stated that "The concept of climate change resilience did not exist at all, let alone the role that small-scale farming in a drought proof farmland, would play, in mitigating climate change" (ibid). This links back to the critique of traditional planning decision-making approaches put forward in Chapter 2, in that often decision-making reflects short-term cost-benefit analyses which do not extend spatially or temporally beyond the site

under consideration. In the PHA, according to Horn (2019:970), “These amendments have systematically eroded the credibility of the urban edge policy.” According to Indego Consulting (2018), the approval of land development applications which contradict the intentions of the urban edge policy are precedent-setting in that they make other similar developments easier to condone. This sentiment was echoed by the participants in Focus Group 1. As such, the phenomenon of the incremental erosion of planning protections on the PHA needs to be halted urgently.

iii) Poor enforcement of land use regulations

Inadequate enforcement and policing of land use regulations has led to a rapid intrusion of non-compliant[99] land uses, especially on the fringes of the PHA (Indego Consultants, 2018). For example, in the Schaapkraal smallholdings area, it was found that only 30 of 62 properties investigated between 2010 and 2013 were compliant with zoning scheme regulations (iKapa Enviroplan & City Think Space, 2013). According to Spatial Planner 1, the zoning scheme is very difficult to enforce in the PHA context due to the slow and incremental nature of land use change, and due to the ambiguity of rural land use zones (which will be outlined shortly). Thus, Spatial Planner 1 argued that poor land use enforcement is not a result of a lack of political will, but rather a result of the very complex nature of land at the urban-rural interface, as discussed at length in Chapter 2 (personal communication, 2021). This confirms the idea previously put forward that a lack of proactive spatial planning at the urban-rural interface makes this space confusing and chaotic. The result is that non-confirming land uses which damage the character and integrity of the PHA are difficult to detect.

According to participants in Focus Group 1, the issue lies in the fact that the City is not proactive in safeguarding the PHA. Instead, incremental urban encroachments are overlooked, and responded to in a passive way after the encroachments have already occurred by shifting the urban edge inward. This was the case with the Schaapkraal buffer- after land use change had already occurred in the area as a result of poor enforcement, the City shifted the urban edge further inwards to, as articulated by Spatial Planner 1, ‘let bygones be bygones.’ However, the issue with this reactive approach is that it has led to the incremental erosion of the PHA. As articulated by a participant in Focus Group 1, “In as much as we (the PHA Campaign) were trying to defend the southern portion from the big developers (Oakland City and UVest), it’s the small incremental developers who just get on with it silently who are destroying the PHA just as much.” For example, as previously mentioned, illegal land uses such as bus depots are common in the PHA. An example of this is indicated in Figure 44.

[99] These are land uses which are not permitted on Agricultural or Rural zoned properties. For example, the use of PHA properties as bus depots or dumping grounds is especially prevalent (Focus Group 1, 2021).

Figure 44: Illegal land use in the PHA- a farm plot is being used as a bus depot in the PHA. Source: author's site photography.

According to iKapa Enviroplan and City Think Space (in a 2013 study commissioned by the CoCT), the fact that parts of the area are zoned as Rural instead of Agricultural leads to suburbanization and land uses which incrementally undermine the character and productivity of the PHA. This is especially an issue in the Schaapkraal smallholdings edge on the west. Rural zoning, according to the CoCT zoning scheme, "...accommodates smaller rural properties that may be used for agriculture, but which may also be occupied as places of residence by people who seek a country lifestyle, and who view agriculture as a secondary reason for occupying their property (CoCT, 2016)" Majority of the PHA land area, however, is zoned as Agricultural. According to the CoCT zoning scheme, Agricultural properties should be primarily used for farming, however provision is made for non-agricultural uses to "...provide owners with an opportunity to increase the economic potential of their properties" (CoCT, 2016). Since large agricultural plots are cheaper to purchase, it is common that citizens buy plots in the PHA and use them to build large, luxury residential developments, as depicted in Figure 45. Since these land uses are not necessarily prohibited within the zoning scheme, they are difficult to prevent and are harmful to the character and integrity of the PHA. Thus, Spatial Planner 1 contends that ambiguity[100] within the zoning regulations makes enforcement difficult.

[100] He states that it is difficult to say whether a land use is "...farming or not farming or extensive residential with a few carrots on the side"

Figure 45: *a large residential development within the PHA, near to the western (Schaapkraal) edge. Source: Author's site photography.*

Speculation is also a major cause of plots in the PHA no longer being used for horticultural purposes. Participants in Focus Group 1 claimed that large tracts of land are lying fallow within the PHA due to speculation, as indicated in Figure 46. Rezoning agricultural plots which market in the PHA for between R680 000 to R964 000 per hectare to commercial property which market for approximately R2 million per hectare can yield significant profits for developers (Indego Consultants, 2018). According to a participant in Focus Group 1, the current land use regulations do not positively enforce that land in the PHA must be actively farmed. As such, fallow lands do not necessarily contravene any regulations, however they are destructive to the integrity and productivity of the PHA.

Figure 46: fallow farmlands within the PHA. Source: Author's site photography.

Utilizing land in the PHA for illegal dumping is another particularly prevalent issue in the area with significant environmental implications (iKapa Enviroplan & City Think Space, 2013; Malan, 2014). For example, in 2013 a large demolition and construction company called Ross Demolition was charged with the illegal dumping of rubble in the PHA (Kings, 2013). Illegal dumping is already having dire effects on the water systems in the PHA, since illegally dumped rubble blocks pathways for water flow and pollutants seep into the critical CFA groundwater (Shoba, 2020; iKapa Enviroplan & City Think Space, 2013). Beyond the environmental implications of urban encroachment though non-conforming land uses, this phenomenon also has significant impacts on the unique character and cultural landscape of the area (iKapa Enviroplan & City Think Space, 2013). According to a participant in Focus Group 1, the current approach is to issue fines to landowners guilty of illegal dumping. However, there is no onus on the landowner to rehabilitate the land or reverse the damage done. As such, the approach towards illegal dumping is reactive and allows polluters to merely pay for the right to pollute.

The rapid growth of informal settlements (indicated on Figure 21 in Section 3.3.1) on the edge of the farmland is also an area of conflict (Govender & Mammon, 2020:106). As previously mentioned, eight informal settlements have emerged on the edge of the PHA (and one within)[101], and have been rapidly growing- between 2011 and 2016 these settlements experienced a growth of 283% (ibid). All of these settlements are on privately owned land, and as such CoCT government officials have argued that they have no jurisdiction over this land and thus are not able to address this issue of encroachment (Swart, 2012). These settlements have poor basic sanitation and waste management infrastructure, resulting in polluted runoff leaching

[101] This was based on a 2018 study and as such, more informal settlements may have emerged in the present.

into the CFA groundwater (Indego Consultants, 2018). Many of the residents of these settlements are evicted farmworkers or residents , and as such the growth of informal settlements speaks to a far more complex, systemic issue with housing in the City. As will be discussed in Chapter 5, the issues in the PHA cannot be resolved without a concerted effort from the City to provide quality housing on well-located and underutilized City-owned land elsewhere. Without this, the development pressures on the PHA will not be resolved.

iv) Crime and safety issues

Since the PHA is surrounded by urban development, with poorly defined and defended boundaries, it is particularly vulnerable to crime. According to Govender and Mammon (2020:105), “Many farmers argue that the easy public access to the PHA is a problem” since fields are generally in close proximity to public roads and urban areas, whilst Battersby-Lennard and Haysom (2012) flag poor spatial definition of the urban edge as a reason for it being so vulnerable to crime. Focus Group 1 participants spoke of the prevalence of vegetable theft[102], which impacts small-scale farmers especially due to their smaller yields. Farmers also report that infrastructure is often stolen to take materials to the scrap yards (Kemp, 2020:61). Beyond theft of produce and infrastructure, there have been many reports of violent crime committed within the farmlands, due to poor safety and security (Kemp, 2020:59). According to participants in Focus Group 1, the issue of land speculation previously discussed intensifies the vulnerability of the area to crime, since large tracts of land are left vacant and as such not surveilled. The prevalence of criminal activity has driven the costs of food up, as farmers need to cover the costs of security and loss of infrastructure (Africa News Agency, 2020). As such, in 2020 the CoCT established a new law enforcement unit responsible for policing rural pockets in the City, called the Rural Safety Unit (RSU) (Africa News Agency, 2020). In the August PHA Area Coordinating Team (ACT) meeting held by CoCT officials, a farmer operating in the PHA noted that the RSU only patrols the PHA in the day time, whilst most of the crimes within the farmlands occur at night (Observation of the CoCT PHA ACT meeting, August 11 2021). A CoCT official argued in response that night shifts are difficult to organize without extended engagement with unions, whilst a PHA Campaign member argued that the involvement of community leaders is a more systemic solution to the issue of crime (ibid). The PHA Campaign’s stance is supported by theories of ‘defensible space’ explored in Chapter 2.

[102] According to a participant in Focus Group 1, this theft of produce is not merely hungry people, but is ‘organized crime’, where criminals steal produce and sell it for a profit.

3.3.5: Community mobilization in the PHA: defending the land from the bottom-up

"...the PHA campaign extends well beyond saving the aquifer and the land for agriculture. Its vision centres on an alternative relationship to the land through a reconnection with and consequent renewal of the soil of the PHA itself."
(Adams et al, 2020)

In light of the failure of traditional planning mechanisms and policies to safeguard the PHA, there has been a significant community mobilization and response. Given the discussion in Chapter 2 regarding the potential of communities and bottom-up planning in realizing regenerative development, this presents a significant opportunity for responding to the challenges faced at the edge of the PHA. As such, this subsection will explore this potential.

The PHA has a long history of community organization. In 1885, the Kaapse Vlakte Landbou Unie (KVLU) was established to represent the interests of the German farmers operating in the area (Erasmus, 2010). This organization exists presently as the oldest farmers' association in South Africa, which many of the white commercial farmers who are descendants of the historical German farmers belong to (Indego Consultants, 2018). The PHA Campaign, however, is currently leading the charge in terms of defending the PHA from urban encroachment and represents a far more diverse group (Robins, 2021). It is spearheaded by Nazeer Sonday, an organic farmer and activist farming in the Schaapkraal area on a 1 hectare small-scale farm known as 'Vegkop Farm' (ibid). Since he grew up on his grandfather's rented plot in the PHA, Sonday has a long history in the area and a strong connection[103] to the land as a result (ibid). The PHA Campaign emerged after the dissolution of the Schaapkraal Civic and Environmental Association (SCEA), which Sonday established in 2008 in order to represent the interests of PoC small-scale farmers due to the KVLU largely representing white commercial farmers (Robins, 2021). After the SCEA gradually whittled away due to political 'brick walls', Sonday was the last remaining activist (ibid). In 2015, he met Susanna Coleman, an optometrist and activist, with whom he began the PHA Campaign (ibid). Despite different community organizations existing, the shared struggles faced by farmers in the PHA has created a strong sense of camaraderie and has strengthened social capital (Erasmus, 2010). Thus, Battersby-Lennard and Haysom (2012) describe the PHA farmers as a 'generally cohesive group.' For example, established commercial farmers have supported small-scale emerging farmers in entering the agricultural market and improving their productivity (Erasmus, 2010).

Generally, the tactics of the PHA Campaign involve awareness raising (as indicated in Figure 47) and using the legal process to challenge development applications which contradict the long-term public interest and ecological prosperity. However, the space of litigation is a highly unequal 'playing field.' Robins (2021) notes how in the 2020 court case opposing the Oakland City development, the CoCT was represented by eight high paying lawyers, whilst the PHA Campaign relied on one pro bono lawyer. The legal process is highly risky for the Campaign

[103] As quoted in Robins (2021), Sonday said "the place (is) just in my psyche."

members, who are vulnerable to being demanded to pay for court case charges if they lose any of their legal battles (Knight, 2019). The process is thus draining of the members' limited financial resources and time, and thus cannot be sustained in the long-term when up against the monetary might of big developers and City officials. As such, innovative new approaches to safeguarding the PHA in the long-term need to be explored.

Figure 47: PHA Campaign activists protest the Oakland City development at the Cape High Court[104].

The PHA Campaign has become an important source of community and support for the neighborhoods along the PHA edge. Through promoting regenerative farming methods and community cohesion, the PHA Campaign has mobilized in resistance against the commodification of the PHA. As articulated by Adams et al (2020), "The land and soil of the PHA needs to be understood not simply as a natural resource to be extracted for glass mining, or "developed" into another urban development, but as a site of struggle with profound meaning and relational connectivity." This links back to and confirms the literature discussed in Chapter 2, with regards to the role of community urban farming in fostering social connections and restoring the fractured socio-ecological relationship. According to Olver (2019:98), the PHA

[104] Source: Hall, R. 2019. (Image). Available: https://twitter.com/ruthhallplaas/status/1184018553067986944 [2021, October 29].

Campaign has collaborated with a coalition of up to 50 organizations. As such, the group has not only fostered social connections within the PHA Community, but has also established a vast network with like-minded social movements.

In addition to this, the Vegkop farm which is depicted in Figure 48 is promoting skills-development in regenerative farming methods among the local community, including advocating for commercial farmers to opt for more nature-based farming methods, such as composting in order to protect the CFA (Adams et al, 2020; Robins, 2021). It was also mentioned in Focus Group 2 that the PHA Campaign has seen a growing interest among the surrounding communities in purchasing organic, locally grown produce from small-scale farms such as Vegkop Farm. In order to enhance this, the PHA Campaign is currently working towards establishing a permanent farmers market on the grounds of Vegkop Farm (Focus Group 2, 2021). As such, the PHA Campaign has been diffusing its values into local communities and as a result setting the foundations for community buy-in for the vision for the PHA that will be put forward in Chapter 4.

Figure 48: Vegkop Farm employs permaculture farming methods, which involves planting diverse crop types as opposed to monoculture methods. This is more restorative for the soil, and creates better habitat for biodiversity. The farm is also more vibrant and visually appealing as a result.

The farming methods employed are inspired by the traditions of the Khoi communities who historically lived off the land in a low-impact, symbiotic way (Sonday, 2020). Specifically, Sonday (2020) notes that historical Khoi regenerative farming revered the ‘waterdraaer’ (the CFA) for its symbolic value and its ability to support life and enable food cultivation. In the present moment, the PHA Campaign is attempting to revive this deep spiritual and cultural connection to the natural resources which support lives and livelihoods (ibid). According to Adams et al (2020) this

reverence for indigenous knowledge which sees our relationship with ecology as a state of reciprocal and symbiotic entanglement resists the colonial and modernist project of separation and fragmentation. In this, they claim that "Viewing the soil as a living archive of memory accordingly also works to resist centuries of colonial epistemicide that sees the soil as a resource to be plundered for capital accumulation" (ibid).

During the major food insecurity experienced due to job losses as a result of the COVID-19 Pandemic[105], the PHA Campaign provided over 9000 people with food parcels of fresh produce from local farms (Adams et al, 2013). In addition to this, as previously mentioned, the Vegkop Farm is used as a learning space for evicted and unemployed farm workers and other residents in the area who are interested in joining the emerging regenerative small-scale farmer movement (Sonday, 2019). As such, Sonday's farm and the Campaign Centre has become an important space of gathering, community and resistance in the area. The PHA Campaign's work is also setting up a cohort of regenerative small-scale farmers to lead the charge should the 'living urban edge' be implemented.

However, it is important to note that the values and vision of the PHA Campaign for the area are unlikely to be wholly representative of the entire community. Kemp (2020) interviewed large-scale, white commercial farmers operating in the PHA, mostly regarding issues of crime and illegal urban encroachment. For many of these farmers, the solution to the issues at the PHA edge lies in more reliable and comprehensive policing of the area (Kemp, 2020:65). According to one of the farmers, "What should actually happen here is to put up and close Philippi off with these big vibracrete walls, and block off the squatter camps" (Schultz, quoted in Kemp, 2020:65). However, this approach contradicts ideas of regenerative communities and cultures, and does not solve the issues facing the PHA in an integrated way. More policing in the PHA also perpetuates conflict and tension. As was argued in Chapters 1 and 2, this dissertation calls for the imagining of more healing and cooperative social relationships and a sense of community which can restore the fragmentation brought about by apartheid segregation and modernist planning. This will be explored in the next Chapter.

3.4: Conclusion

This Chapter has set the contextual foundations for the 'living urban edge' concept to be put forward in Chapter 4. This builds on Chapter 2 which established theoretical and conceptual foundations for the concept. It is clear that in South Africa, the urban edge has failed to meet its purpose of preventing urban development encroachment on green space. This is epitomized in the case of the PHA, where despite a long-standing policy commitment to protect it through an urban edge, the area has been and continues to be constantly eroded by urban development encroachment. Section 3.2 provided an overview of the political, decision-making and planning context in which this struggle for safeguarding the PHA from development encroachment occurs. This served to contextualize the discussion in Section 3.3.4 which endeavoured to

[105] This is a trend throughout South Africa, where the current COVID-19 Pandemic has revealed previously 'invisibilized' deficiencies in urban food security (Haysom, 2021). As a result, communities have increasingly taken food growing and provision into their own hands (ibid).

understand why urban development encroachment has persisted in the PHA despite the ongoing use of spatial policies to protect it. Section 3.3.4 identified that the PHA is threatened due to the political complexity of top-down implementation, a lack of proactive spatial planning and design for the urban-rural interface, a failure to celebrate and enhance the area's character and poor enforcement of land use regulations. These challenges are indicated on Figure 49. Thus, the Chapter that follows will take these shortcomings as the starting point for generating a new approach to safeguarding green space from development encroachment.

Therefore, investigating how the PHA can be proactively planned for so as to ensure that this area remains an integral part of the CoCT's green infrastructure is essential. The benefits of doing so were made clear in Section 3.3.2, due to the role that the PHA plays in securing food security and sovereignty, water security, livelihoods, wellbeing, social cohesion and heritage. In addition to this, the PHA is a rare pocket of open space in the Cape Flats where connections to nature can be cultivated. Thus, Section 3.3.2 concluded that the PHA is integral in securing a regenerative future for Cape Town.

Broadly, in a global context of climate change and rising socio-economic inequality, development and ecological protection come into conflict. This trade-off narrative between development and ecological preservation is at the root of the pressures facing open space in urban contexts such as the PHA. In South Africa, this dynamic is intensified by the need to redress apartheid spatial policies, as discussed in Section 3.2. However, regenerative development offers a means to attain both socio-economic benefits and ecological prosperity. This development concept can thus work towards resolving conflict and tension at the urban-rural interface by creating symbiotic relationships, and offers an alternative conceptual framework to the ideas underlying the urban edge. Regenerative development offers a means for cultivating relationships between people and the environment, an opportunity which is intensified at the urban-rural interface. Hence, regenerative development has strong links with bottom-up planning as discussed in Chapter 2. This Chapter has outlined how in the PHA there is a significant opportunity for harnessing community mobilization spearheaded by the PHA Campaign and the growing social network between small-scale farmers who are committed to preserving the farmlands. Thus, the following Chapter aims to take this opportunity as a starting point for investigating a new, bottom-up approach to safeguarding the PHA from development encroachment. This can respond to the shortcomings of top-down implementation and poor enforcement of land use regulations as indicated on Figure 49.

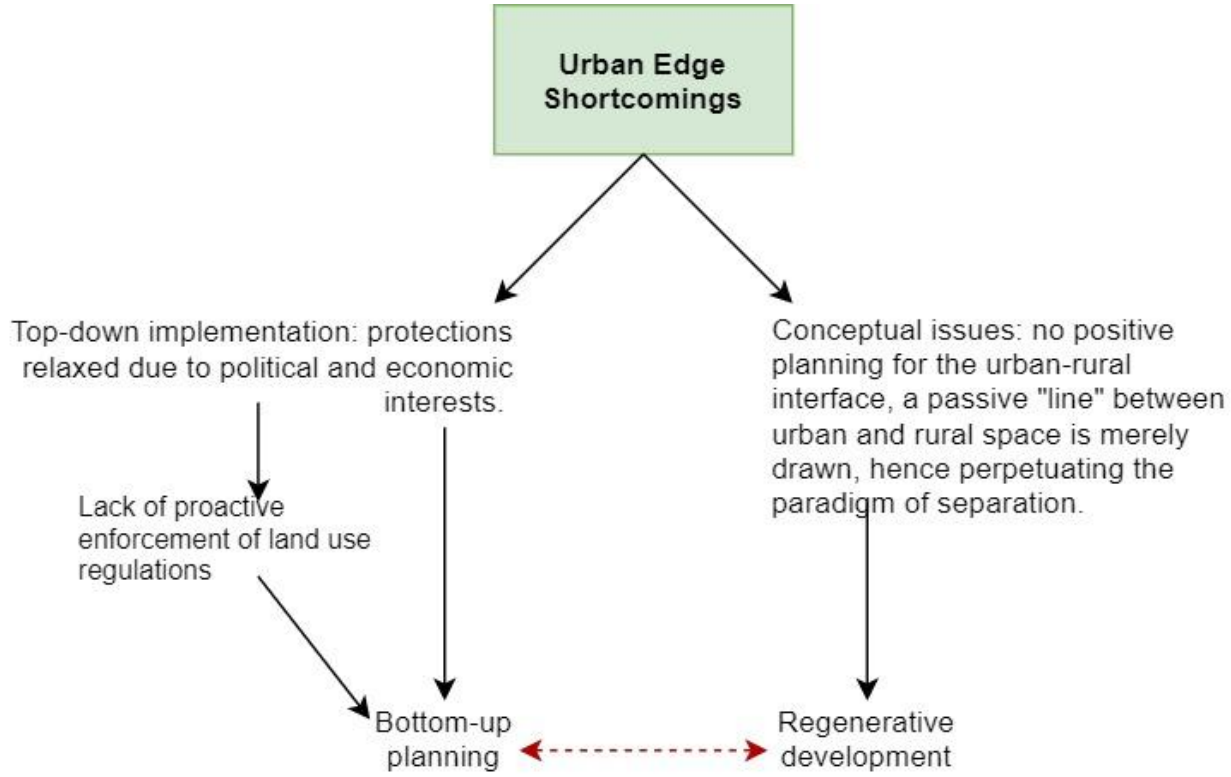

Figure 49: Diagram indicating the major shortcomings of the urban edge tool in the PHA. Regenerative development and bottom-up planning offer an opportunity for responding to these shortcomings.

Hence, bottom-up planning and regenerative development can respond to the shortcomings of the urban edge tool, as indicated on Figure 49. The following Chapter will work with these theoretical underpinnings to reimagine the urban edge.

Chapter 4: Towards a 'living urban edge': Developing a spatial conceptual framework for a regenerative urban-rural interface in the PHA

4.1: Introduction

"Without leaps of imagination, or dreaming, we lose the excitement of possibilities. Dreaming, after all is a form of planning"
(Gloria Steinem)

As discussed in Chapter 2, the urban-rural interface is a zone of conflict and tension between the dynamics, demands and externalities of urbanity, and the integrity and function of agricultural space. This tension is present in the ongoing uncertainty and friction in the land use management of the PHA, outlined in Chapter 3. Urban development encroachment persists in the area, despite a long-standing policy commitment and effort to protect it through an urban edge. Hence, this Chapter aims to respond to the challenges facing the PHA in order to facilitate and imagine a more regenerative future for the farmlands. To this end, a novel conceptual spatial framework for the regenerative planning and management of the urban-rural interface will be put forward and pioneered in the PHA case study. Chapter 3 concluded that the PHA is facing a significant threat of urban encroachment due to inadequate and inappropriate spatial planning, political complexity and shortcomings in implementing protective spatial policies However, the community mobilization that has emerged in response to these challenges presents an opportunity for imagining innovative approaches for safeguarding the land.

Overall, in Chapter 2 it was found that the planning literature engages minimally with how the urban-rural interface can be proactively planned for in such a way that the inherent tension that this space faces is mediated and more positive relationships between the urban and rural are formed. Arguably, this lack of engagement is partly due to the traditional dichotomy between urban and rural which characterizes the modernist approach as discussed in Chapter 2 (Gottero, 2019:3). Dewar (1994:1) states that this spatial ambiguity at the urban-rural interface is an "increasingly visible phenomenon" across South Africa. According to Swaffield (2012:406), given the rising pressure of urbanisation, there is a pressing need to explore new approaches to managing the urban-rural interface. As argued by Gallent et al (2006:xvi) and at length in Chapter 2, comprehensive and static land use and containment strategies do not work for the dynamic nature of the urban-rural interface. As a result, there is a need to investigate "...emergent 'spatial' and more strategic planning model(s), which hold out the promise of more integrated and positive planning on the edge" (ibid).

Govender and Mammon (2020:99), suggest that when imagining these new approaches,"...a symbiotic relationship must be cultivated between urban and agricultural land uses...articulated

in a spatial framework that provides clarity as to how urban development can assist in protecting productive agricultural activity." This idea of symbiotic relationships where the friction between human development needs and ecological conservation needs are reconciled aligns clearly with the regenerative development theories outlined in Chapter 2. Thus, instead of viewing the PHA as a site of intractable contestation, the space can be viewed as a prime opportunity for imagining the transformation of the status quo. This was expressed by Allen (2003:138), who argued that the urban edge presents a valuable opportunity to resist the conceptual urban-rural dichotomy discussed in Chapter 2. According to Parham (2019:109), due to the fact that the urban edge is a place of interaction between the city and the production of food, spatial design and planning at this interface is a key leverage point for building a "new food paradigm.[106]"

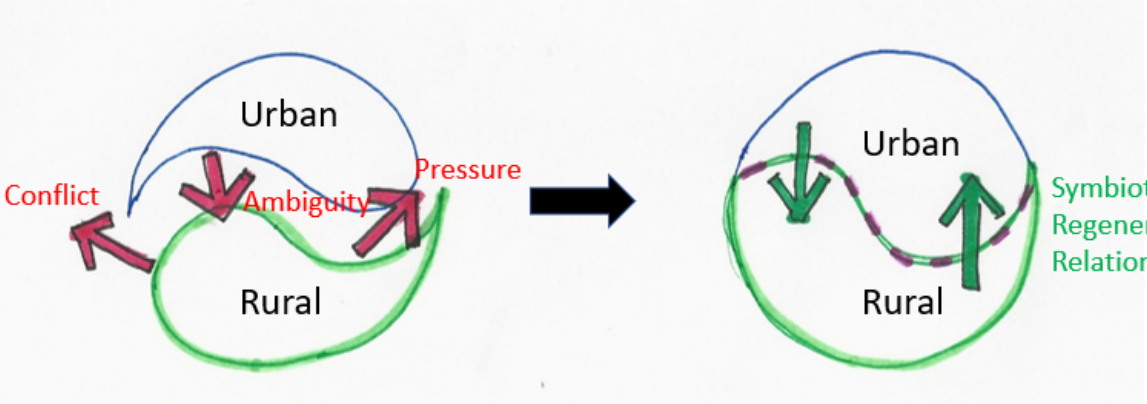

Figure 50: Diagram indicating the conceptual shift from urban edge to 'living urban edge'. Author's own.

Thus, this Chapter aims to create a new spatial concept for managing the PHA urban-rural interface which secures benefits for both people and the environment. This can be enabled through embedding people in a symbiotic relationship with the landscape, hence resisting the harsh separation perpetuated by the urban edge tool. This novel spatial concept has been termed the 'living urban edge'. As outlined in Chapter 1, the 'living urban edge' is a bottom-up means for protecting the PHA which resists the hard separation between the urban and the rural that the urban edge tool epitomizes. The basic idea is to create a clearly articulated spatial concept for the interface between the urban and the rural at the edge, which clarifies how the land at this interface can be used proactively in a way that benefits both local communities and natural systems. This will be achieved through creating a 'buffer' of small-scale farms around the border of the PHA, as indicated on Figure 51.

[106] See discussion in Chapter 2 Section 2.2.3 regarding the importance of changing current food production paradigms in order to secure regenerative development.

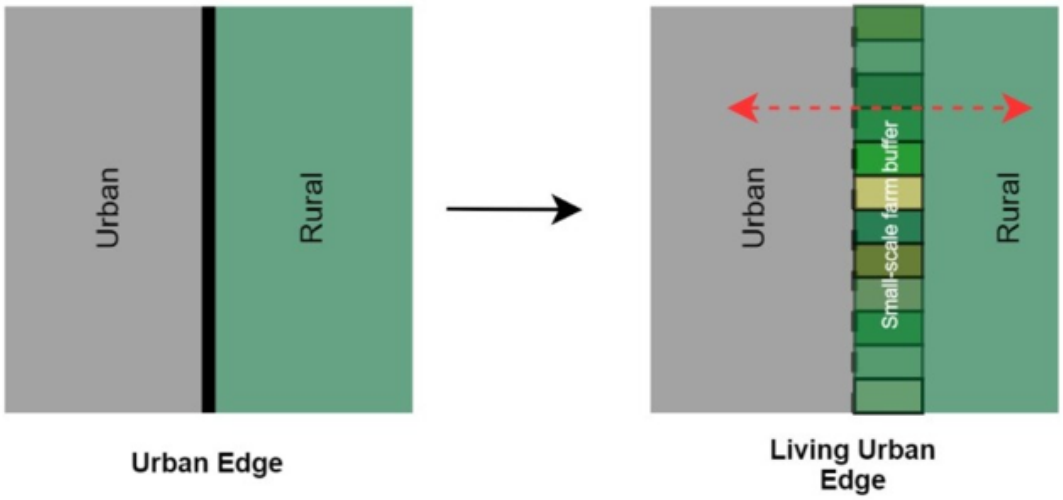

Figure 51: Simplified conceptual diagram indicating the 'living urban edge'. Source: Author's own.

It will be argued in this Chapter that enabling bottom-up protection of the PHA through small-scale urban agriculture offers an opportunity for strengthening social capital and community ties in order to mend the social separation that apartheid spatial planning created. Additionally, the concept aims to support local livelihoods through attracting pro-poor economic development to the PHA and supporting small-scale farmers. In turn, the small-scale farming buffer can act as a line of defence against development encroachment and a means towards creating a more legible and active transition between urban and rural space. In this, a 'living' urban edge is created in that the farmlands are defended by mobilized people as opposed to passive and poorly enforced and implemented legislation.

From the perspective of the PHA Campaign, the hope is that engendering a new 'story' or 'dream' for the PHA will better equip the Campaign to engage in a proactive dialogue with stakeholders regarding the future of the area (Focus Group 1, 2021). As such, the benefit for the PHA Campaign in working with a researcher to co-produce this spatial intervention is that their ideas can be "couched in a well-grounded theorem[107]" (as articulated by a PHA Campaign member in Focus Group 1) which will improve their ability to negotiate with government officials and developers in order to achieve their vision for the PHA. Beyond this, the hope is that the thinking behind the 'living urban edge' concept can inspire other cases where urban development encroachment is an issue[108].

[107] Particularly, the PHA Campaign is searching for a spatial planning concept which is grounded in academic literature, planning theory and international precedents regarding how other countries have managed the urban-rural interface. These research informants can then be used to create design principles which can engender a proactive spatial vision for the PHA (Focus Group 2, 2021).
[108] As described in Chapter 2, development encroachment at the urban edge is a globally prevalent issue. Even within the CoCT itself there are other areas which face similar issues to the PHA. For example, in 2014 the CoCT Mayoral Committee approved for the urban edge to be shifted to allow for urban

Furthermore, as indicated on Figure 52 below, (Indego Consultants, 2018) which predicts the outcomes of various future scenarios regarding planning for the PHA, if there isn't a proactive vision generated for saving the PHA the farmlands will continue to degrade. As indicated in the "Grave the PHA" scenario, if no policy or spatial direction is provided for the PHA's future, urban encroachment will continue with deleterious impacts on food security, water security, climate change resilience, social cohesion and the needs of informal settlement residents on the edge (Indego Consultants, 2018). Thus, the 'living urban edge' concept is emerging also out of a necessity for a cohesive vision and roadmap for the regenerative future of the PHA.

Scenarios	KEY VARIABLES					
	Policy Certainty	**Protection of the Cape Flats Aquifer**	**Needs of Informal settlements addressed in the PHA and buffers**	**Social cohesion & safety**	**Food Security**	**Climate change resilience**
"Grave the PHA" **Status Quo continues**	Lack of policy certainty; ad hoc planning decisions; weak regulation, land speculation; urban edge encroachment; land invasions; sub-division of land use	Incompatible land use and hazards; urban encroachment; water use licensing unresolved; weak state water quality management and regulation	Insecure tenure; lack of services; high unemployment; high school drop-out rate; high level of social instability	Safety and security threats; increased cost of doing business	Informal settlements food insecure; national and provincial food security threats; increase in national price of vegetables	Climate resilience of the CCT lowered through loss of CFA natural recharge area; groundwater contamination; decrease in food security; and higher transport costs increasing carbon emissions
"Pave the PHA" **PHA not protected & urban encroachment continues**	Loss of irreplaceable agricultural land; loss of current and future economic potential from agriculture	Irreplaceable loss of natural recharge area for the CFA; incompatible land use and hazards; urban encroachment	High development and transport costs; possibility that low-cost housing unaffordable in the PHA owing to water table level	Safety and security threats will persist without interventions	Local, national and provincial food security threats; increase in national price of vegetables	
"Save the PHA" **PHA Protected & S/SW land made available for agriculture**	Highly productive land protected for farming and land reform; strong regulation; stable land market	CFA properly managed; natural recharge area protected; water licensing and access resolved; water quality managed	Needs of informal settlement dwellers addressed and relocation of settlements where required	Investment by all sectors in safety; public works programmes; social services	CCT's food security enhanced; technological innovation and sustainable agricultural practices; networking	Protection of CFA natural recharge area and CFA water quality; food and water security; lowered carbon emissions
"Stave the PHA" **PHA Protected & S/SW land lost to the PHA**	Land reform; stable land market; loss of most productive land in the south	Some attempt to manage the CFA; contamination of the CFA persists	Failure to prioritise and address needs of informal settlements by the CCT	No cohesive community safety initiative in the PHA	Loss of food security as commercial and big commercial farmers withdraw	Natural recharge system of CFA retained but weak management

Figure 52: various scenarios regarding the future of the PHA. Note that "Stave the PHA" refers to protecting the 'core' PHA whilst handing over the properties in the south to the UVest and Oakland City developers.

It is important to note upfront that this concept aims to gesture at how planning interventions can shift to reduce human-environmental conflict through designing regenerative solutions. The aim is not to put forward a comprehensive plan or a panacea for the future of the PHA, but rather to articulate general design principles which over time can develop into a new way of relating to rural land at the City edge. The intervention should ideally be developed incrementally over time with deep community participation and engagement. It is also important to note that the hope is to explore alternative means for bolstering the effectiveness of the urban edge, not to replace the urban edge entirely. As articulated by the PHA Task Team put together by the CoCT in 2009 to advise on the future of the PHA, legal measures and planning policies such as the urban

development on historic farmlands in the Durbanville area (Greater Cape Town Civic Alliance [GCTCA], 2014).

edge have helped to protect the PHA from development encroachment, but that these measures alone have proven to be insufficient to counteract urban pressures on the land (CoCT, 2009). This was corroborated by Spatial Planner 1, who argued that the urban edge has been useful to City officials, but its effectiveness needs to be enhanced (personal communication, 2021).

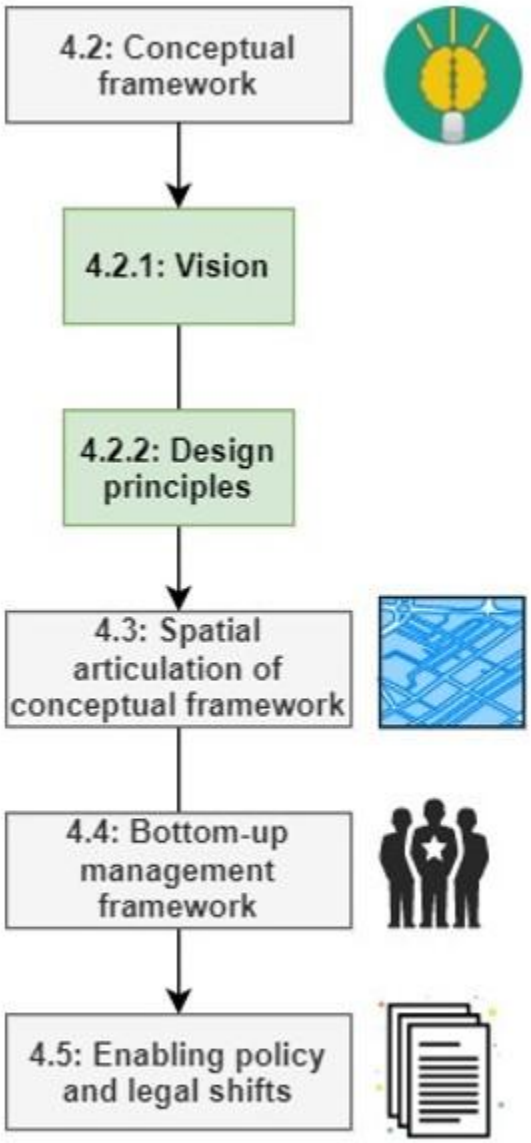

Figure 53: Process for generating the 'living urban edge' spatial concept intervention. Author's own.

Figure 53 indicates the overall organization of the Chapter. The Chapter will begin with an overall conceptual framework for the 'living urban edge' in Section 4.2. Section 4.2 will begin with articulating a conceptual vision for the PHA, followed by a spatial articulation of this vision through generating design principles for the 'living urban edge', based on the theories outlined in Chapter 2 and international precedents. Following this, Section 4.3 will pioneer the design principles on a 'pilot' edge of the PHA. the western (Schaapkraal smallholdings) edge. Section 4.4 will set out how the land making up the 'living urban edge' can be managed from the bottom-up. Finally, Section 4.5 will outline how the CoCT's planning policy and legislations need to shift to enable the spatial concept outlined in the Chapter.

4.2: Conceptual Framework

4.2.1: A regenerative vision for the PHA

This subsection aims to put forward the overarching vision for the PHA which the 'living urban edge' concept hopes to embody. This was informed largely by Focus Group 2 with the PHA Campaign.

Box 1: Origins of the 'living urban edge'- the Schaapkraal Civic Environmental Association (SCEA) PHA Vision Plan, 2009.

The 'living urban edge' concept was first expressed by the SCEA (now the PHA Campaign) in a short report called the *SCEA PHA Vision Plan*. The spatial concept is indicated on Figure 56.

The SCEA proposed that the core PHA farmlands are protected in perpetuity (through planning regulations such as by declaring the area as a PA), and that areas where urban creep have significantly altered the character of the area should be excluded and consolidated (SCEA PHA Planning Committee, 2009). This view was also expressed by Spatial Planner 2, who was part of a planning team commissioned by the City to create spatial planning recommendations for the PHA. It is proposed that this core farmland is protected by a 'green zone' of small-scale farming plots with a minimum subdivision of 0.5 hectares in order to achieve the following results:

- Better utilization of agricultural land by necessitating regenerative farming methods
- Provide better security for the core farming area
- Facilitate land reform
- Create better integration between the core farmlands and the surrounding urban area
- Prevent illegal land use and occupation on open and under-utilized land on the edge

In addition to this, the SCEA proposed that the R300 extension is planned as a spatial barrier to protect the core PHA farmlands on the northern edge, as opposed to extending the R300 through the PHA core as the City currently plans to do.

The SCEA Vision Plan was created through extensive engagement with the local community, and as such aimed to respond to commercial farmers and their concerns with crime, small-scale farmers and their struggle for recognition and informal settlement residents and their need for quality housing (Focus Group 2, 2021). According to the PHA Campaign, this shared sense of struggle created unity and a strong cohesion among these diverse stakeholders (ibid).

The PHA Campaign envisions a future where the PHA embodies "just land use", which they define as a situation where natural systems, the land and communities are "treated with respect" and the farmlands are enhanced and celebrated (Focus Group 2, 2021). The hope is that the PHA can be safeguarded and supported so as to function as a localised food and livelihood source which benefits the adjacent communities in the Cape Flats (ibid). This can serve to repair fragmented relationships between Capetonians and their food, which can ultimately restore connections to the living world[109]. This is seen by the PHA Campaign as a form of resistance against the barriers created by the apartheid planning era modernist paradigm. Through creating a 'living edge', the PHA is better connected to the rest of the City, as opposed to separated from it by an abrupt urban edge cadastral line. This can be achieved through embedding communities in a productive and symbiotic relationship with the land through promoting small-scale regenerative agriculture. Local livelihoods can be enhanced through agro-tourism development and the sale of

[109] See the discussion in Chapter 2 regarding the ability of urban agriculture to restore socio-ecological relationships.

produce, and enhanced rural landscape character can work to improve the visibility of the PHA to Capetonians and transform the area from a neglected space to a destination that is celebrated. Spatial Planner 2 argued that this can bolster the public will to protect these vital farmlands through better connecting people with the origins of their food. This engages with the opportunity at the urban-rural interface to cultivate greater connections between people and the environment, as discussed in Chapter 2. The literature reviewed in Chapter 2 also spoke to the restorative role of urban agricultural projects in degraded landscapes (Olivier & Heinecken, 2017:170). Thus, small-scale farming on the PHA edge can be used to transform fallow, vacant farmlands and illegal dump sites into thriving green spaces for the surrounding communities to enjoy. The following subsection will outline in more detail how spatial design at the urban-rural interface can be used to work towards this vision. This notion of a 'living urban edge' thus focuses on protecting land in a way that is caring and restorative, and resolves the assumed tension between socio-economic development and preserving green space. This serves to reframe the language of the traditional urban edge tool which hinges on narratives of force, policing and hard boundaries. Box 1 adjacent indicates the first expression of the 'living urban edge' by the SCEA (now the PHA Campaign) in 2009. This was proposed through the SCEA vision plan for the PHA.

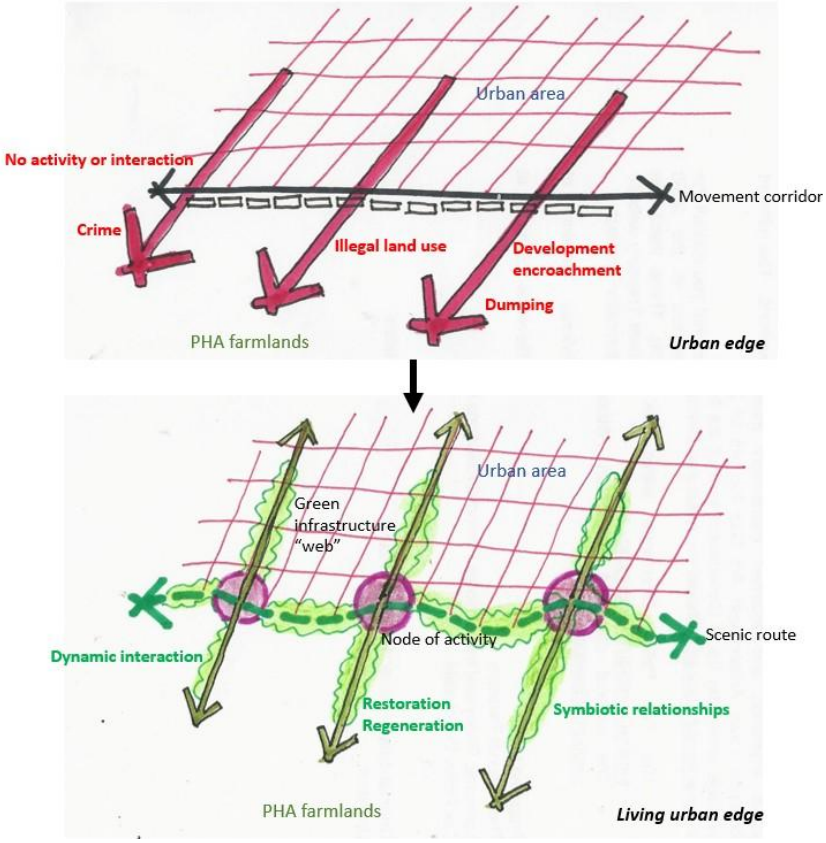

Figure 54: vision diagram indicating the shift from urban edge to "living urban edge". Author's own.

This vision for the PHA edge, illustrated in Figure 54, is supported by the policies discussed in Chapter 3. The 2009 CoCT Development Edge policy, discussed in Chapter 3, states that spatial plans should "Provide for low-intensity land uses along the urban edge to act as buffers in protecting farmland and conservation areas from the negative impact of urban development." The 2021 Draft CFDP discussed in Chapter 3 also recommends that a 'positive urban-rural interface' is established at the PHA edge through defined yet visually permeable edges with development 'fronting' onto the interface in order to create a lively urban environment. Spatial Planner 2 also expressed that through his own research[110], he found that small-scale agriculture at the urban-rural interface is the most appropriate land use for creating a softer transition than the current hard urban edge 'line' separating urban and rural space. As such, a supportive policy environment for the 'living urban edge' vision seems to exist, which indicates that there is a possibility for cultivating a cohesive vision for the PHA between PHA Campaign activists (and the broader PHA community) and CoCT decision-makers.

4.2.2: Cultivating a design principles for the PHA urban-rural interface

This subsection aims to outline the key design principles which formulate the 'living urban edge' spatial concept for the PHA. These principles were informed by the focus groups with the PHA Campaign, interviews conducted with spatial planners involved in the PHA area, various parts of the literature and theories discussed in Chapter 2, as well as the key issues facing the PHA identified in Chapter 3. The principles were also informed by various precedent studies (in 'boxes' throughout this subsection) which examine how spatial planning globally has engaged with the urban-rural interface. Finally, design informants were gathered from various reports[111] commissioned or drafted by the CoCT regarding planning for the PHA. The design principles are outlined on Figure 55 below.

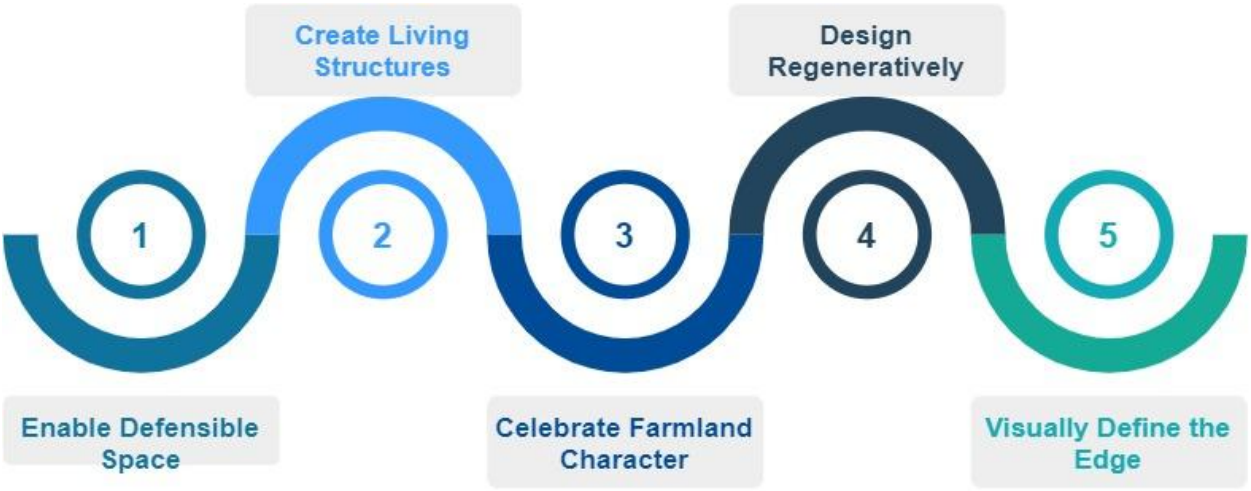

Figure 55: the 5 'living urban edge' design principles. Author's own.

[110] Spatial Planner 2 was part of a 2009 study commissioned by the CoCT and was tasked with generating recommendations as to how the PHA should be planned for in the future.
[111] See iKapa Plan and Enviroplan, 2013; CoCT, 2009 and Setplan, 2018.

Box 2) The Casey Southern Urban-Rural Interface Design Guide. Melbourne, Australia

Casey is an Australian municipality on the outskirts of the City of Melbourne. It is a fast growing municipality and as such the surrounding rural land is subject to significant development pressure. The urban form is **contained by an urban edge, but this has been shifted due to urban development pressure four times over the past 10 years, hence reiterating that issues with the top-down implementation of the urban edge tool are prevalent globally** (City of Casey, 2020). As a result, the local government has put forward design guidelines for the urban-rural interface in the Casey area, which aim to **"create a sustainable urban-rural interface by transforming the (urban edge) from an abrupt edge to a dynamic place that celebrates the meeting of the urban and the rural settings"** (ibid). In addition to this, the design guidelines aim to **"promote a thriving place with abundant landscape, habitat corridors and drainage waterways with a strong sense of recreational amenity for the community"** (ibid). These intentions echo the vision for the PHA 'living urban edge'.

The design guidelines argue that the urban edge should be redesigned as an "attractive and meaningful permanent edge to the city" (City of Casey, 2020). According to the design guidelines, creating a clearly defined and vibrant urban-rural transition zone can respond to the following challenges, many of which mirror the key issues facing the PHA:

- A lack of a clear transitional area along the urban-rural interface, which creates conflict and confusion between rural and residential land use
- Inactive residential back fences along the urban edge which creates a 'deadened' environment
- A lack of aesthetic and visual character along the urban edge
- Safety concerns due to a lack of surveillance
- Uncertainty regarding the fact that the urban edge may be moved again
- "Fragmented and private land ownership along the UGB, posing major hindrance to establishing and maintaining connectivity for the green corridors"

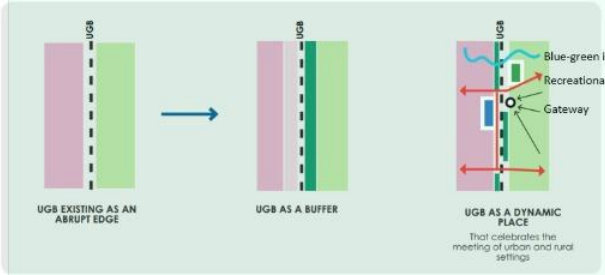

Figure 56: conceptual diagrams indicating the aim of the Urban Design Guidelines. UGB refers to Urban Growth Boundary, which is a different term for the urban edge.

Figure 56 indicates the design guidelines' concept and vision for the urban edge. Transforming the urban-rural interface into a 'dynamic place' involves integrating the urban and the rural through connective blue-green infrastructure, visual gateways and recreational pathways. This can also enhance the visibility and celebration of the rural landscape so that it is better valued. This creates a more permeable and active urban-rural interface, as opposed to a 'hard' buffer as is the case for greenbelt urban growth boundaries yet it also creates a legible boundary as opposed to the abstract 'abrupt edge.'

Design Principle 1- Enable Defensible Space

As discussed in Chapter 2, theories of defensible space postulate that having people present in and invested in a public space can enhance safety since more 'eyes on the street' can enable the surveillance of a space. According to Newman (1996), the physical layout of communities can enable residents to keep watch over their area. This theory is thus highly compatible with theories of bottom-up defense of green space which were explored in Chapter 2. In the absence or ineffectiveness of government support from the top-down, defensible space design allows communities to be self-reliant (Newman, 1996).

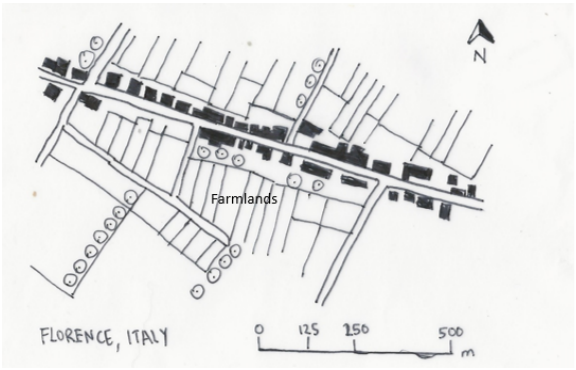

Figure 57: A precedent image indicating how built structures can be placed strategically along movement routes to allow for the defense of open space[112].

Whilst this concept is conventionally applied to urban streetscapes, housing and public space, the 'living urban edge' concept endeavors to extend it to the context of the PHA urban-rural interface. **Appropriate development along the edges of the PHA could enable community surveillance over the PHA farmlands by residents and farmers, thus deterring the crime and illegal land use which severely threatens the area.** According to Battersby and Marshak (2014), "Gardens (can be) used to create defensible space- blocking criminals' escape routes and

increasing the public range of vision." According to Dunn (2010; quoted in Battersby & Marshak, 2014), small urban farms in Vrygrond, a low-income area in the south-west of Cape Town, enhanced safety and security in the surrounding area as with more people out in their gardens, there were more 'eyes on the street.'

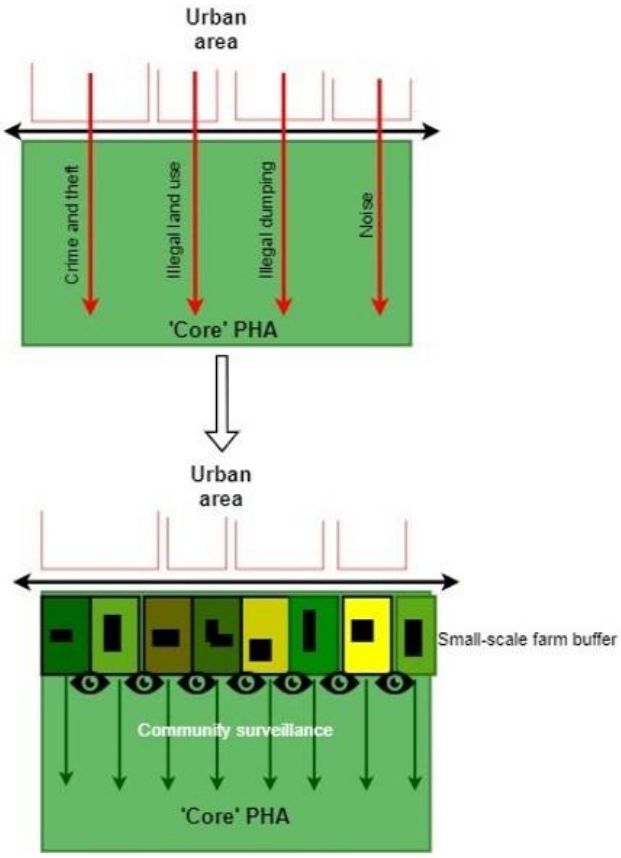

Figure 58: *Conceptual diagram indicating the defensible space principle.* Source: Author's own.

Where appropriate, buildings (low-density, small farmhouses on the small-scale farm buffer) can be arranged so as to form a physical yet active and visually permeable boundary at the edge (see Principle 5). This is illustrated in Figures 57 and 58. According to the PHA Campaign (Focus Group 2, 2021), creating a "wall of community land ownership[113]" around the edge of the PHA, and putting underutilized or illegally utilized land to appropriate use[114] can defend the edge from development encroachment and crime. The logic is that with the edge entirely owned and put to productive use, it will be more difficult to get away with activities such as illegal dumping undetected. As will be discussed in Section 4.4, there needs to be regulations in place on the small-scale farming edge properties in order to ensure that these properties do not perpetuate further urban encroachment on the farmlands, and remain low-density and sensitive to farmland character. The notion of 'defensible' farmlands is illustrated on Figure 58. Clearly, the idea of community surveillance supports ideas of bottom-up protection of green space discussed in Chapter 2. This creates a 'living' boundary as opposed to a hard, physical boundary such as a large wall as suggested by the commercial farmer quoted in Chapter 3 subsection 3.3.5.

Green buffers[115], which are based on the notion of greenbelts discussed in Chapter 2, can also be used to create an additional line of defence against urban externalities. This will be discussed further in Principle 5. As suggested in Precedent Box 2 (Casey, Austaliai), there needs to be an appropriate setback between green buffers (See Design Principle 5) and homes

[113] See Section 4.4 for detail regarding the land ownership structure which can manage the 'living urban edge' properties.
[114] This will be addressed further in Principle 5.
[115] Here defined as protected zones where greenery is established around sensitive and vulnerable areas (Godfrey, 2015). This is similar to the idea of 'greenbelts' discussed in Chapter 2, although green belts are generally employed at the whole city scale.

on the urban-rural interface in order to enable unobstructed passive surveillance of the surrounding area (City of Casey, 2020).

As recommended by Dewar et al (2009:6) in Figure 59, the built footprint can be placed along roads and movement patterns in a 'grid' formation in order to enable the enclosure of smaller, more defensible units of agricultural space. This can enhance the concentration of 'eyes on the farmlands' in order to improve safety, as the areas which are surveilled by residents are broken up into smaller, more easily defendable 'blocks'. Residents and farmers on the edge of the PHA can also benefit from this pattern due to the increased accessibility and mobility provided by a movement grid.

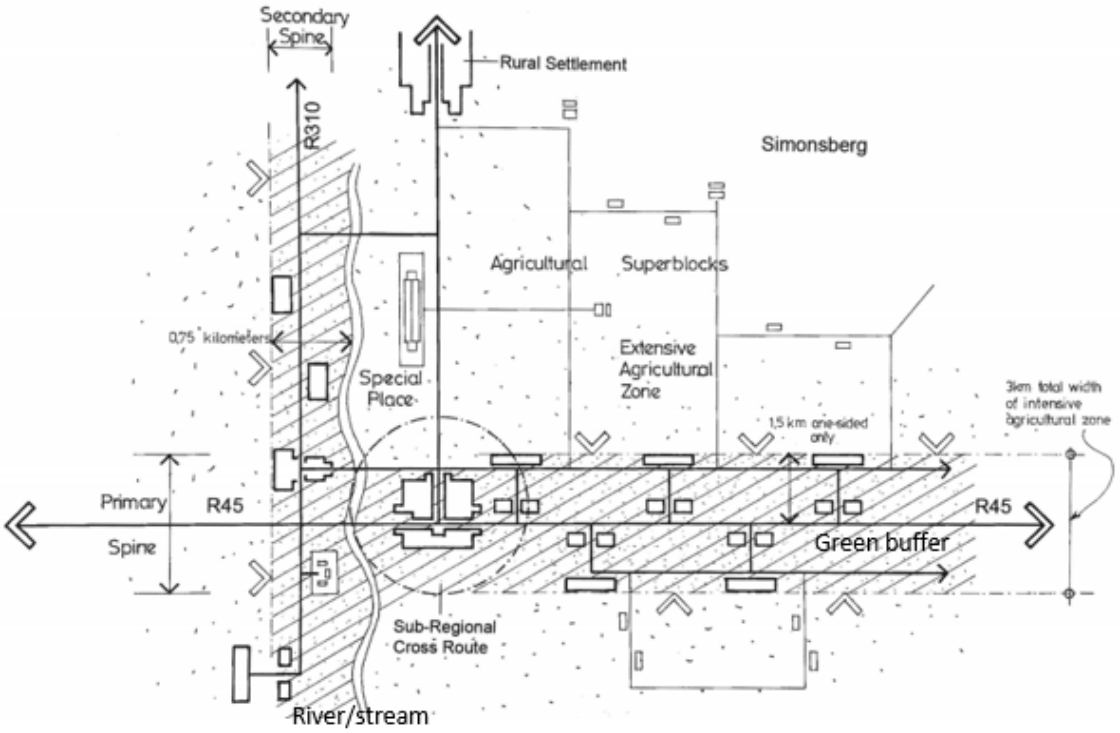

Figure 59: Dewar et al (2009:6) recommend the use of 'agrisuperblocks[116]' where a grid pattern of settlement along roads (for accessibility) is used to enclose farmlands.

[116] The notion of a 'superblock' is conventionally applied to urban streetscapes, and describes a large area of urban land bounded by arterial roads (Bausells, 2016). Interior local roads are for low traffic, local use only (ibid).

Figure 60: Agrisuperblock settlement pattern in Vancouver, Canada. Source: Google Earth satellite image

Figure 60 shows how an agrisuperblock settlement pattern can look in space. The agrisuperblock concept provides a possibility for how the 'living urban edge' concept can be implemented, subject to further investigation.

The agrisuperblock concept provides a possibility for how the 'living urban edge' concept can be implemented, subject to further investigation. In applying the notion of agrisuperblocks to the 'living urban edge', Figure 61 was generated to conceptualize how small-scale farms can be possibly arranged along movement routes in the PHA. This both defends the internal farmlands from any externalities arising from movement routes, and breaks up the overall PHA footprint into smaller, more easily defendable blocks. Green buffers can further define and defend the agrisuperblocks as previously mentioned, and can also create a network of continuous green infrastructure which is essential for ecological function and for providing windbreaks for farms. Clusters of community services such as education centres, small agri-processing facilities or healthcare facilities can be placed at crossover points of the movement routes in order to service the communities that make up the 'living urban edge'. Again, in order to combat further development encroachment on the agrisuperblocks, strong regulations need to be attached to the small-scale farm edge properties, as will be discussed in Section 4.4. The agrisuperblocks should also be organized according to the existing road network within the PHA, as building more roads can open up opportunities for further encroachment.

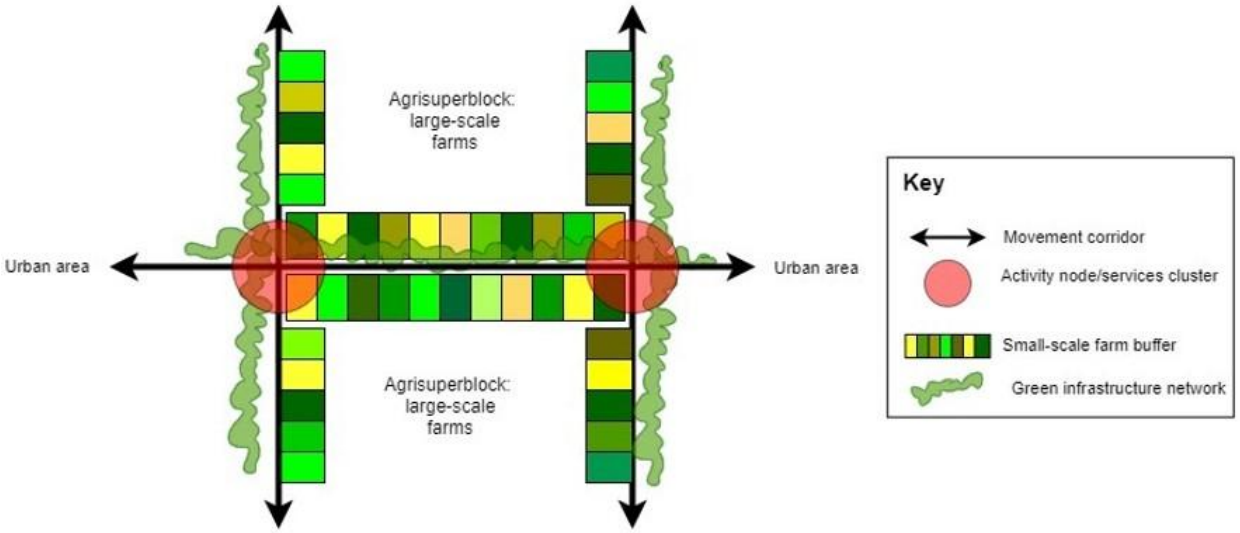

Figure 61: the Agri-superblock concept applied to the PHA. Source: Author's own.

Design Principle 2- Create Living Structures (Reduce Separation)

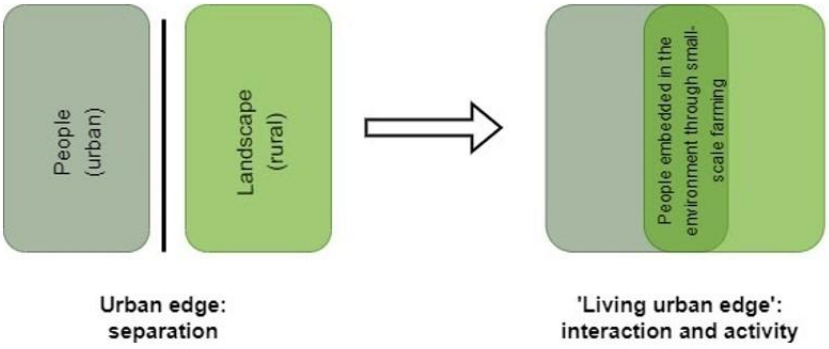

Figure 62: Diagram indicating the shift from a 'harsh' boundary to a 'living' boundary. Source: Author's own.

As discussed in Chapters 2 and 3, much of the language around urban growth management and control revolves around the paradigm of separation at the root of the sustainable development narrative. However, in the case of the urban edge tool this creates a sterile environment at the urban-rural interface, hence failing to establish connections between city dwellers and their food sources. This is despite the urban-rural interface offering a significant opportunity for integrating the city and the countryside as discussed in Chapter 2 (Li, 2010:3; Gallent et al, 2013). Thus, the hope is that the PHA 'living urban edge' concept can **begin to imagine an urban-rural interface where this separation and tension between urban and rural landscapes can be reconciled.** As discussed in Chapter 2, permaculture design refers to the 'edge effect' which argues that where two different ecosystems overlap there is the most abundance and activity in a system (Engels, 2015). Thus, in designing for the PHA edge, where urban and rural systems overlap, reducing separation in order to allow dynamic interaction to occur is paramount for creating a 'living' boundary. This is illustrated on Figure 62.

As described in Chapter 2, the idea of designing 'living structures' imagines a built environment where people are embedded in relationship with the landscape. In the context of the 'living urban edge', this is achieved through connecting people to the land through food growing, as illustrated on Figure 62. As previously mentioned, this enhances the cadastral urban edge boundary with a 'living' barrier of mobilized people and green infrastructure. In addition to this, Gallent et al (2006:19) call for planning at the urban-rural interface to strive for multifunctionality[117]. The result is a more vibrant and enlivened urban edge than the current situation which was described in Chapter 3. The endeavour to create lively and active urban-rural interfaces is supported by the CoCT 2009 Development Edges Policy discussed at length in Chapter 3, which calls for spatial design that creates "positive urban edge interfaces" (CoCT, 2009). The 2021 Draft CFDP also supports this approach, by stating that "positive urban-rural interfaces" should be encouraged at the edge of the PHA. This can be achieved through developing activities on the edge at 'gateway[118]' points or nodes (see Principle 3), such

[117] According to Gallent et al (2006:16), multifunctionality in planning suggests that land uses should not be segregated and compartmentalized. Rather, synergistic relationships should be sought between different land uses in the same space.

[118]According to Chiu (2014), a gateway is an element of urban design which functions as an 'entrance' at "strategic edges" or a "gathering place which acts as a transition between different spaces."

as farm stalls or informal trader bays for the sale of small-scale farm produce. This is illustrated on the cross-section below (Figure 63ii). The place where the cross-section is located is not important and was merely selected to illustrate where in space active urban-rural interfaces can be created along the PHA edge. This can also enhance local livelihoods. Provisions must be made within the zoning scheme to allow for this. This will be addressed in Section 4.5.. This is in contrast with cross-section A-B (Figure 40) in Chapter 3 subsection 3.3.4, which shows the current lack of a clear transition between urban and rural space at the PHA edge.

Figure 63i: Cross-section AA located on the PHA western edge. Source: Google Earth satellite imagery.

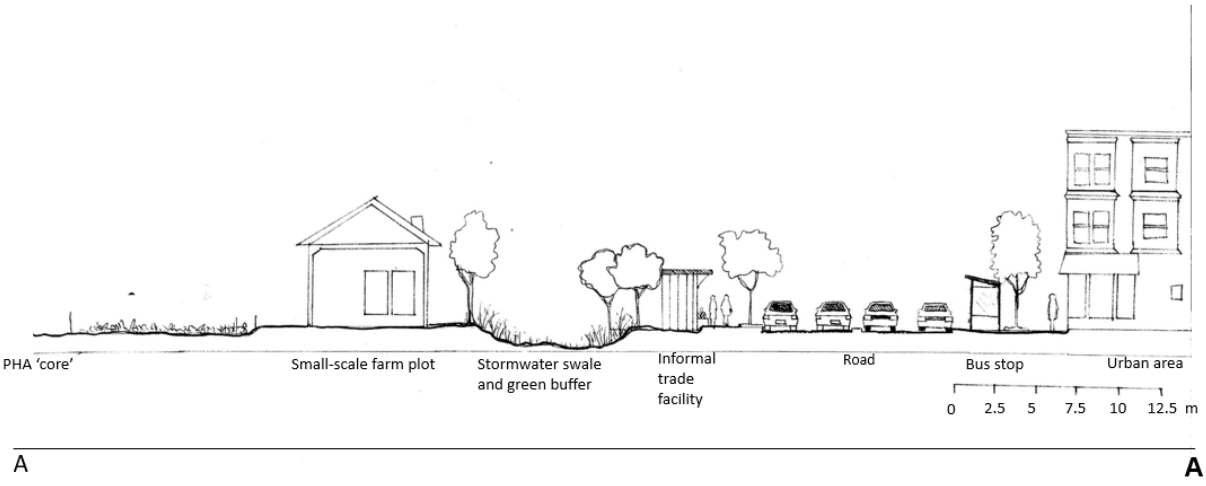

Figure 63ii: Cross-section AA illustrates how an active urban-rural interface can look in the PHA. Author's own.

Design Principle 3- Celebrate and Enhance the PHA

As discussed in Chapter 3, a major cause of the development encroachment on the PHA is a lack of value ascribed to the area and its role in the City. This is both due to how value is conceptualized[119], and how 'visible' the PHA is to Cape Town residents. Thus, it is essential to invite people into the PHA and celebrate its unique character in designing for its urban-rural interface.

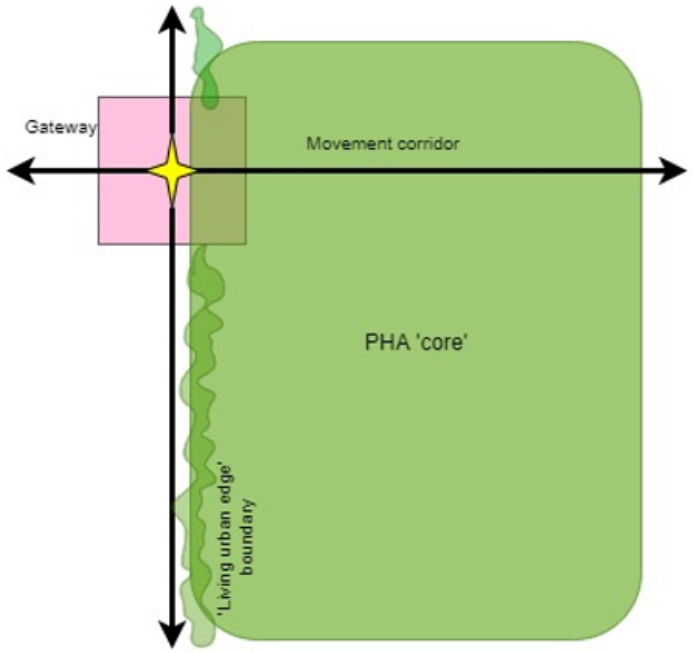

Figure 64: the 'gateway' concept illustrated. Author's own.

According to the 2021 Draft CFDP, spatial planning efforts in the PHA should endeavor to improve direct public access and recreational opportunity (such as scenic cycling) through introducing NMT routes through the PHA and enhancing '**gateway**[120]' points (CoCT, 2021). According to Chiu (2014), a gateway is an element of urban design which functions as an 'entrance' at "strategic edges" or a "gathering place which acts as a transition between different spaces." According to Rhees (1996), gateway planning arranges the landscape to "...reward the viewer with a sense of arrival and a positive image of the place." The gateway concept is illustrated on Figure 64. Generally, gateways are strategically positioned where key movement corridors intersect or by a landmark, as theorized by Lynch (1960) in *The Image of the City* (de Lange, 2009). Lynch's (1960) notion of 'legibility' is key to the idea of gateways. 'Legibility' refers to the ability of city dwellers to 'read' and orient themselves in the cityscape (ibid). Thus, establishing gateways into the PHA can both enhance the visibility of the area, and can assist in making the currently ambiguous transition between city-scape and farmland more legible. As indicated on Figure 64, gateways should be established at strategic points on the edge of the PHA in order to encourage movement into the 'core' PHA along certain movement routes. However, as indicated on Figure 64 the 'living urban edge' will be in place to control access so that movement into the PHA is not disorganized and energy is directed along strategic pathways. At the gateway points, activities which are compatible with the character of the PHA should be supported, such as public fresh produce

[119] See discussion in Chapter 2 regarding the failure to account for non-monetary value when undertaking trade-off decisions.

[120] Specifically, Setplan spatial planners recommended in a 2018 study commissioned by the Western Cape Department of Agriculture that gateways are established off Strandfontein Road into Ottery road and into 18th avenue, and off Weltevreden Road into Varkens Vlei road (Setplan, 2018).

markets, public parks or informal trader facilities. Landscaping, signage and urban art can also be used to signify a gateway (Rhees, 1996). A 'gateway' for the PHA is illustrated in Figure 65.

Figure 65: a 'gateway' into the PHA. Author's own.

In addition to this, **movement linkages** should be created to reintegrate the PHA with the surrounding City and to enhance access to and engagement with the PHA. Linkages should especially be created to surrounding destination places and recreational facilities (indicated on Figure 27 in Chapter 3 subsection 3.3.2) in order to unlock the latent potential of the PHA to act as a recreational and ecological destination of metropolitan scale significance (ibid).

As discussed in Chapter 3, encouraging Capetonians to experience the PHA and form a connection with it can arguably increase the value placed on it by the public, which can bolster the support for safeguarding the farmlands from development encroachment. The recreational space that is available to Cape Flats residents can also be enhanced, which aligns with Alexander et al's (1977:25) view that all farmlands should be "truly public" as a means to create connections between people and nature. The PHA Campaign also expressed that ideally they would like to see a PHA which is treated as a "commons" (Focus Group 2, 2021).

: Investments in agri-tourism such as equestrian and NMT trails, farm-to-table restaurants and farmers' markets can generate local livelihoods and support Principle 2 by creating an active and lively urban-rural interface. Spatial Planner 2 emphasized especially the need for a 'people's market[121]' in the PHA where the food grown by small-scale farmers can be sold. Since small-scale farmers are generally unable to compete with commercial farms for supplying

[121] Fresh produce markets in the CoCT are generally 'upmarket' and inaccessible with few local dishes sold, such as the Oranjezicht City Farm Market (Spatial Planner 2, personal communication). There is a lack of affordable food markets which celebrate South African culture.

supermarkets, a farmers' market is an economic niche to support the economic viability of the small-scale farming buffer. Currently, there is a Philippi Fresh Produce Market in the Philippi East (indicated on Figure 13 in Chapter 3) industrial node, but this market focuses on selling wholesale produce to bigger supermarkets (Spatial Planner 2, 2021). There is thus no market on the PHA edge itself, nor a fresh produce market which focuses on supporting small-scale farmers in the PHA. Figure 66 indicates a precedent for the character of such a market. Spatial Planner 2 also emphasized the potential for fresh produce 'box' delivery schemes throughout the CoCT as a means for selling small-scale farm produce. In Focus Group 2, it was expressed that the PHA small-scale farmers have seen a growing interest among CoCT residents in purchasing locally grown, organic produce, especially since the COVID-19 Pandemic.

Figure 66: a fresh produce informal market in Lagos, Nigeria. There is a lack of fresh produce markets in Cape Town which celebrate South African culture and support informal traders[122].

It is also essential that design guidelines are generated for preserving the rural landscape character[123] of the PHA. The enforcement of this will be addressed in Section 4.4. Dewar et al (2009:3) recommend the following principles for maintaining rural character:

- Keep the development footprint as small as possible[124]
- Ensure that the settlement occurs in relatively small pockets
- Separate development parcels by green corridors
- Avoid urban infrastructural forms such as wide, tarred roads and traffic circles
- Maintain the dominance of NMT by providing generous sidewalks

[122] Source: Whitehouse, D. 2020. (Image). *Africa: self-sufficiency in food production is urgent priority.* Available: https://www.theafricareport.com/47486/africa-self-sufficiency-in-food-production-is-urgent-priority-bureau-veritas/.

[123] Landscape character is the distinct, recognizable pattern of elements which make up a place and distinguishes it from other places (Worcestershire City Council, n,d).

[124] This can allow for continuous view lines into the farmlands (see Principle 5). In addition to this, minimizing the built footprint can aid groundwater infiltration and retention which is essential for the functioning of the CFA, as mentioned in Chapter 3.

- Development should be concentrated on the edge of farmlands in order to ensure continuous open space and maximize the land used for production

Vegetated swales to manage stormwater and the strategic planting of trees to create wind breaks were used historically by farmers in the PHA (Focus Group 2, 2021). As such, these ecological elements have become a key component of the PHA's landscape character. As previously mentioned, green buffers can also be used to better spatially define the 'living urban edge'. Additionally, using stormwater swales can address the stormwater management issues in the PHA identified in Chapter 3. As such, using green buffers and stormwater swales as design elements offer multiple benefits. The importance of green buffers and swales in the PHA will be expanded on through Design Principle 4.

Design Principle 4- Design Regeneratively

Precedent Box 3: the Ontario Greenbelt Plan 2017, Canada.

The Great Lakes region in Ontario experiences similar pressures to the PHA. It harbours some of the provinces' richest biodiversity and farmland, but is also one of Canada's fastest growing regions in terms of population (Government of Ontario, 2017). In order to protect ecologically sensitive and agriculturally productive land from development encroachment, the Government of Ontario developed a greenbelt of permanently protected land at the urban-rural interface, which also "Provides for a diverse range of economic and social activities associated with rural communities, agriculture, tourism, recreation and resource uses" (ibid). Thus, beyond merely creating an inactive buffer zone of green space at the urban edge to contain growth as is the case with historical greenbelt strategies discussed in Chapter 2, the Ontario Greenbelt Plan imagines a greenbelt which is used appropriately and proactively by people. In addition to this, beyond merely drawing a cadastral 'line' to delineate an urban edge (as discussed in Chapter 2), ecological buffers serve to spatially define the interface between urban and rural. The benefit of this is that the ecological buffer will bring multiple ecosystem services to people, and will provide habitat to biodiversity.

Figure 70: the Ontario Greenbelt Plan (2017). Source: Government of Ontario. 2017. (Image)

As discussed in Chapters 1 and 2, the 'living urban edge' concept is rooted in the notion of regenerative development and design. As previously discussed, regenerative design replaces traditional linearized systems with circular, self-restoring systems which are based on nature's intelligent design. This can help to resolve tensions between people and the environment in the PHA, hence also supporting Principle 2. Given the importance of the CFA for Cape Town's water security, as discussed in Chapter 3, it is essential that care is take to ensure groundwater recharge through Water Sensitive Urban Design (WSUD)[125]. WSUD is inspired by the workings of natural catchments. This involves using permeable surfaces in order to reduce surface runoff and increase groundwater restorationAs discussed in Principle 3, vegetated stormwater swales and green buffers can be used to enhance groundwater recharge and manage the PHA's stormwater.

These infrastructure solutions are inspired by the functioning of natural catchments, and as indicated on Figure 67 they serve to reduce surface runoff (and hence flooding), and ensure maximum groundwater

[125] WSUD is a planning and urban design approach to managing stormwater which reconceptualises stormwater as a resource that can be used to restore natural water flows (

replenishment. As indicated on Figure 67, this stands in stark contrast to urban stormwater systems.

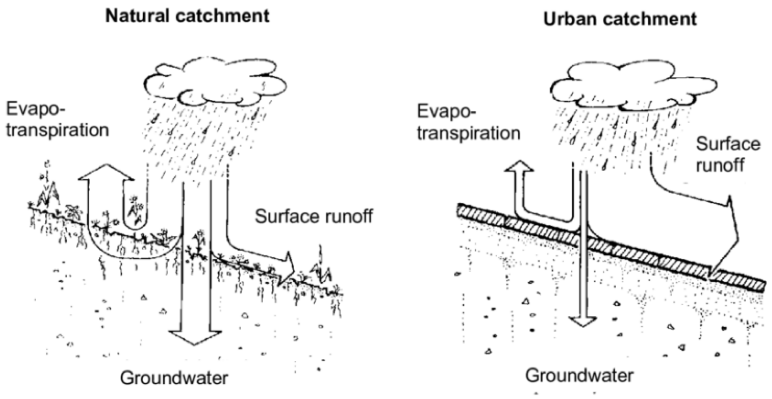

Figure 67: WSUD (natural catchment) versus urban catchment (traditional stormwater drainage)[126].

As indicated on Figure 68, the swales can be used to feed green buffers of trees and shrubs which as discussed in Principle 3 are essential for farmland character. Additionally, the trees can create defensible space (Principle 1) and can be strategically planted along the edge to enhance Principle 5 (visually define the edge).

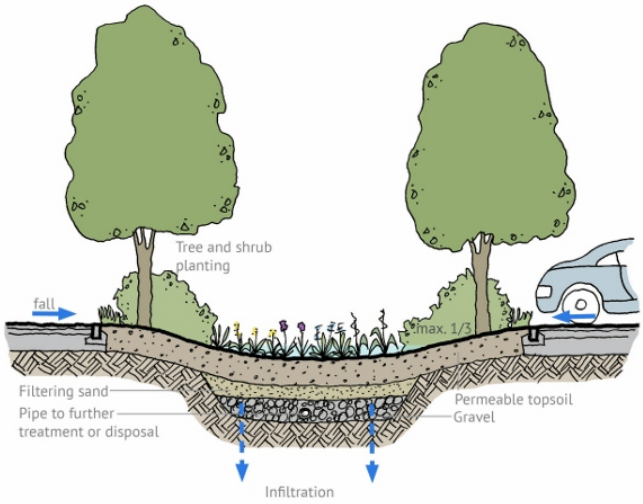

Figure 68: *cross-section indicating the stormwater swale concept. Rainfall flows from urban surfaces into the swale, is filtered through sand and infiltrates into the groundwater*[127].

It is also essential that farmers in the PHA are incentivised and pushed to transition to regenerative farming practises. For example, the use of chemical fertilizers by commercial

[126] Image source: Sokac, M. 2018. (Image). Water Balance in Urban Areas. *Materials Science and Engineering.* 471. DOI: 10.1088/1757-899X/471/4/042028.
[127] Image source: Susdrain. n.d. (Image). *Filtration Overview.* Available: https://www.susdrain.org/delivering-suds/using-suds/suds-components/filtration/filtration.html [2021, November 02].

farmers is a big threat to the aquifer's integrity. This will need to be implemented through policy and legislation, as will be discussed in Section 4.5.

Design Principle 5- Visually Define the Edge

Chapters 2 and 3 argued that a lack of a clear visual and spatial transition and definition between urban and rural space results in an ambiguous urban edge zone, which makes destructive land uses easier to disguise in the chaos. There is therefore a need to visually define the PHA edge in order to combat the prevalent issues of illegal land uses and theft. Thus, the 'living urban edge' aims to create a legible transition from urban to rural space on the edge of the PHA, as recommended by the CoCT 2009 Development Edges Policy (Chapter 3) and in the literature (Chapter 2) (CoCT, 2009; Li, 2010; Govender & Mammon, 2020).

As discussed in Principle 1, settlement patterns can be used to enclose farmlands in order to create defensible space. This can also create visual definition at the urban-rural interface. This was corroborated by the PHA Task Team put together by the CoCT in 2009, who recommended that limited and carefully considered urban development can be used along the PHA edge in order to 'rationalise' and 'consolidate' the boundary (CoCT, 2009:11). As previously mentioned, green buffers can also be used to spatially define the boundary between urban and rural space and can function as an additional line of defence against urban encroachment and externality (Godfrey, 2015). Roads and linear landscape features such as stormwater systems can also be used to spatially define and hence defend the rural land in a way that coheres with rural landscape character, as mentioned in Principle 3 and illustrated on Figure 69 below (iKapa Enviroplan & Setplan, 2013). This idea was also echoed in the Casey Southern Urban-Rural Interface Design Guide (see Precedent Box 2) where it was argued that roadways and linear open space should be used to "...provide a sense of separation where land uses are not complementary" at the urban-rural interface (City of Casey, 2020). The use of green buffers also can enable the support of biodiversity in the PHA, and can link CBAs to improve ecological functioning. This helps to support Principle 2 ('reduce separation'), as conservation and agricultural land uses are combined, as well as Principle 4 ('design regeneratively'). The use of these design elements to visually define the edge is indicated in Figure 72.

Figure 69: a conservation buffer in an agricultural landscape[128]*.*

However, in Focus Group 2 discussion was had around the tensions that arise in defining and defending the edge, as the 'living urban edge' concept is also grounded in the idea of resisting separation and 'hard' boundaries, as previously discussed. There seems to be an inherent contradiction in this idea of both creating boundaries and working against separation (Principle 2).

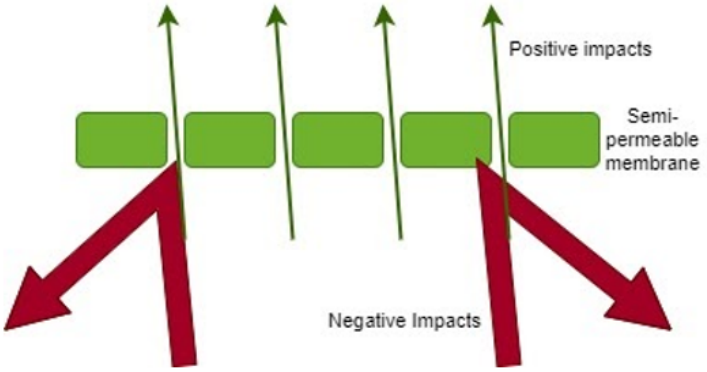

Figure 71: *semi-permeable membrane: a porous boundary which both defends and invites*. Author's own.

However, a participant in Focus Group 2 drew on the idea of semi-permeable membranes in the natural world, where the membranes of plant and animal cells allow in elements that are positive, but defends against negative impacts. This idea is illustrated conceptually on Figure 71. This way of thinking about boundaries can assist in simultaneously defending the edge and inviting[129] people in. Whilst the PHA edge should be clearly defined visually and spatially, access should be promoted at strategic 'gateway' points in order to encourage the celebration of the farmlands (Principle 3). Additionally, the edge should be visually 'porous'. This idea of porosity or permeability was recommended in the 2021 Draft CFDP discussed in

[128] Bentrup, G. 2008. (Image). *Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways.* Available: https://www.fs.usda.gov/nac/buffers/docs/conservation_buffers.pdf [2021, August 01].

[129] As argued in Principle 3, this does not mean unregulated access into the 'core' PHA. Rather, people are invited in at strategic gateway points, as well as through view lines (visual access) into the core farmlands.

Chapter 3, where the management guidelines for the PHA called for well-defined edges that are also visually permeable to enable view lines into the farmlands (CoCT, 2021). This strategy can be bolstered by the use of ‘gateways’ as previously discussed, which allow for a “state of flow” or movement between different spaces (Chiu, 2014). This idea of visual porosity is indicated on Figure 72. Minimum setbacks and maximum building footprints can be mandated (see Section 4.4) between farmhouses on the ‘living urban edge’ small-scale farm plots in order to maintain view lines. The vegetation which makes up the green buffers should also be strategically planted to maintain visual porosity.

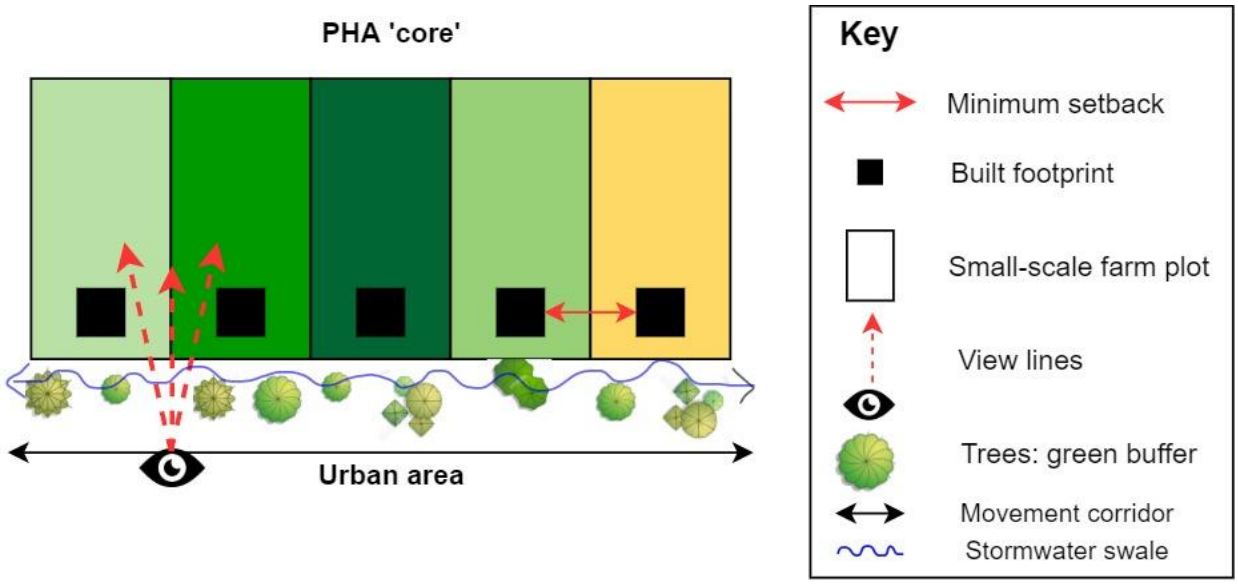

Figure 72: Conceptual diagram indicating a visually permeable boundary at the PHA edge
Design elements such as landscaping and low-density farmhouses can be used to visually define the edge. Setbacks maintain visual porosity.

Figure 73 illustrates how the use of green buffers and low-density housing units for the ‘living urban edge’ small-scale farmers can create a visual definition at the edge. However, views are still maintained into the internal farmlands.

Figure 73: *perspective sketch indicating the concept of defined yet permeable edges* Author’s own.

Porosity or permeability also relates to ‘inviting’ people into the PHA at strategic ‘gateway’ points and nodes of activity as previously discussed. However, boundaries are still kept in place to avoid unregulated access into the farmlands, as diagrammatised on Figure 74.

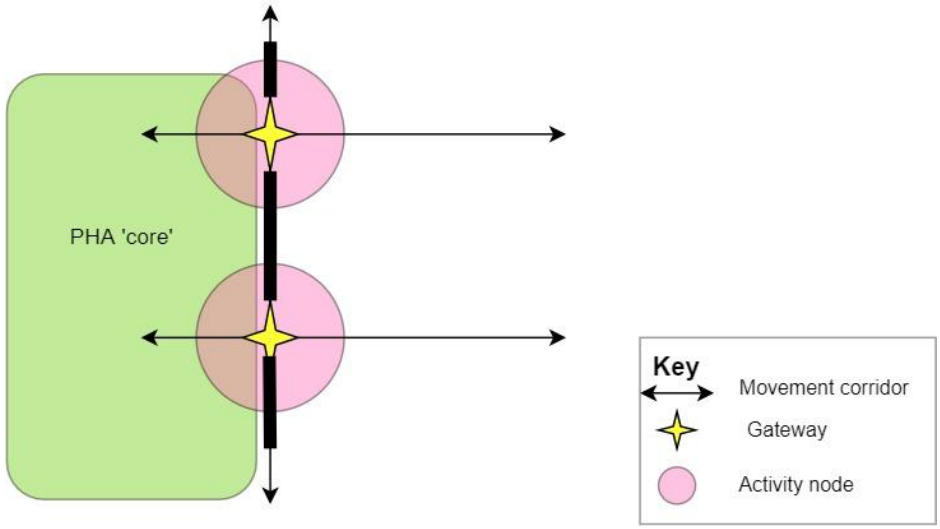

Figure 74: Diagram illustrating how permeable boundaries invite people in at strategic points, but do not allow unfettered access into the PHA ‘core’. Author’s own.

Synthesizing the 5 Design Principles

Figure 75 synthesizes the 5 design principles into a simplified conceptual diagram indicating the ‘living urban edge’. Importantly, there is a move from an urban edge as an abstract and easily amended cadastral ‘line’ to an ‘interface’ or transition zone. In this, it is more difficult for development to ‘bleed into’ the farmlands, as developers will need to ‘jump’ across the small-scale farm buffer to access the agricultural land for development. In this, a ‘wall’ of land ownership and activity is created to define and defend the edge. Simultaneously, the ‘living urban edge’ enhances urban greening, farmland character, and relationships between people and food.

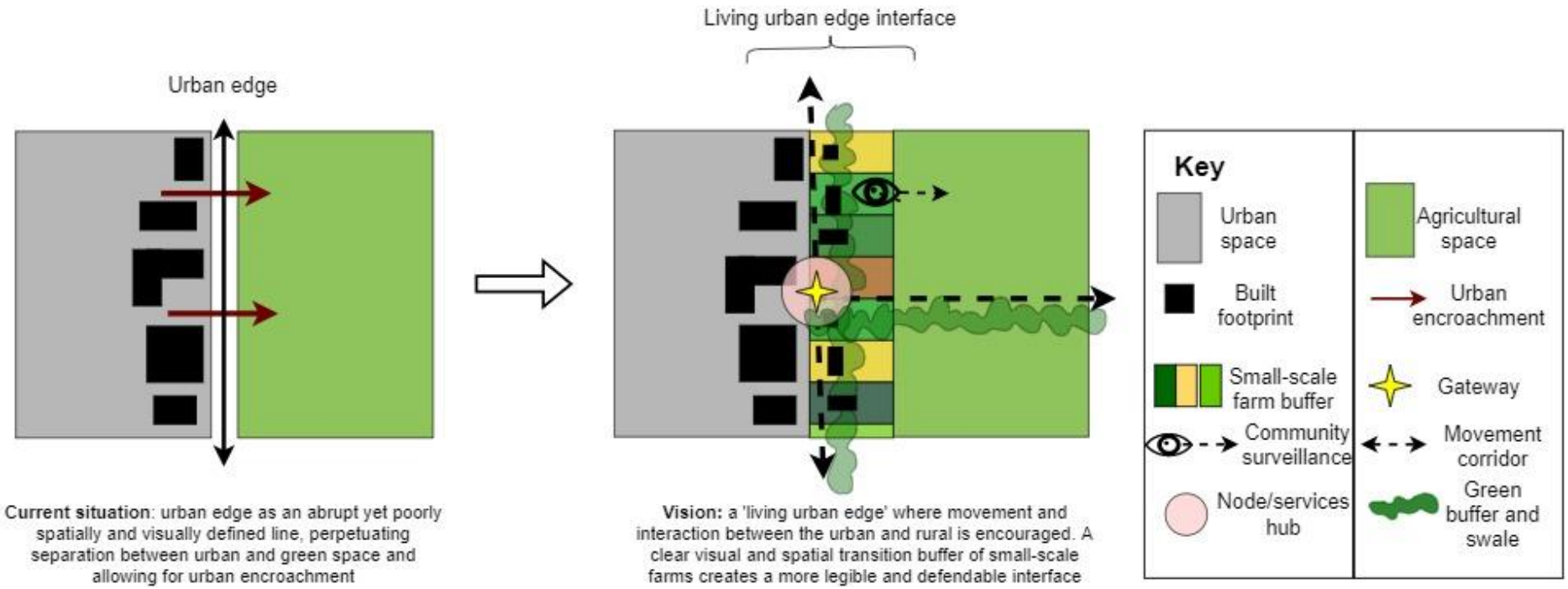

Figure 75: diagram synthesizing the 5 'living urban edge' design principles. Author's own.

Figure 76 indicates how each design principle responds to multiple challenges facing the PHA (identified in Chapter 3) simultaneously. Thus, the principles combined can create a resilient response to urban development encroachment in the PHA.

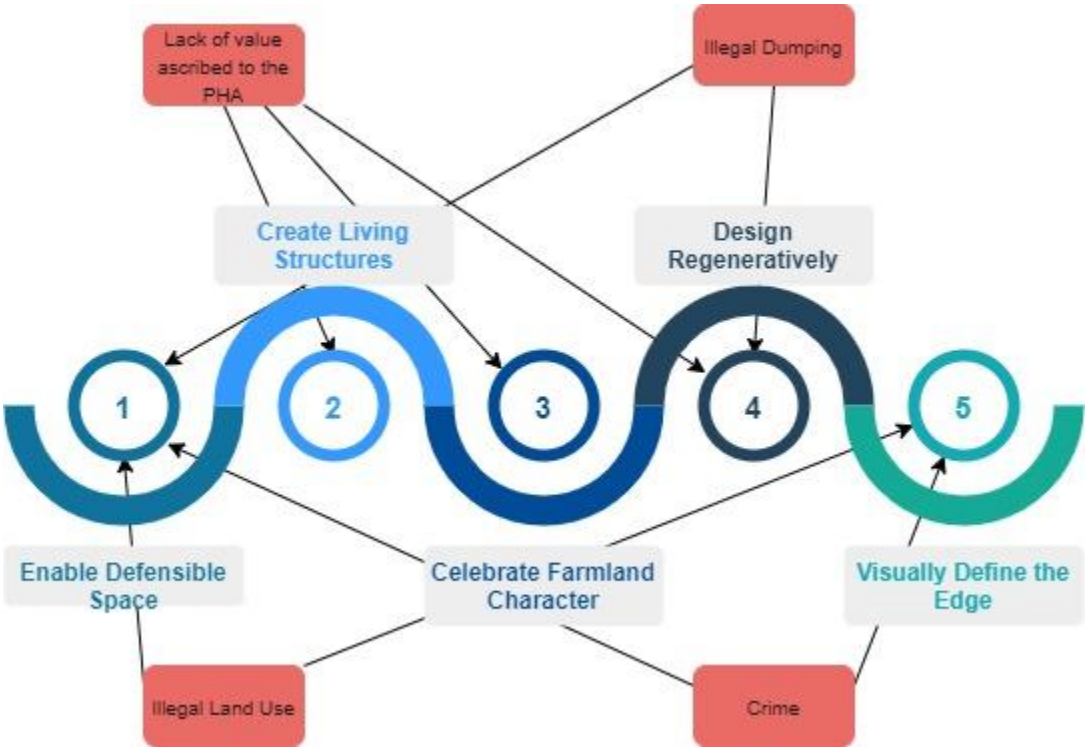

Figure 76: Diagram indicating how the 5 'living urban edge' design principles respond to multiple challenges facing the PHA. Author's own.

4.3: Spatialising the 'Living Urban Edge' Concept in the PHA

"The very complexity of the (PHA) means that novel and innovative ways are required to facilitate engagement in the area, to support and validate the value that it offers and to initiate processes that enable the effective governance and protection of the area"
(Battersby-Lennard & Haysom, 2012)

This Section aims to spatially represent the design principles and concepts outlined in the previous Section in the PHA itself. To this end, the principles and a vision for the long-term future of the PHA will be spatially represented on the entire PHA in Figure 77. Following this, a more site-level representation of the 'living urban edge' will be pioneered on a pilot edge of the PHA. The Schaapkraal (western) edge was selected as the pilot edge, since in Chapter 3 it was found that urban development encroachment is most prevalent and rapid in this part of the PHA.

There continues to be significant developer interest in subdividing farm plots for residential development to the east of the area currently defined as the Schaapkraal buffer (Setplan, 2018). In addition to this, Spatial Planner 2 stated that they are constantly approached by developers interested in rezoning farm plots along Strandfontein road. As such, there is an urgent need to spatially define and defend this edge in order to protect the productive core farmlands. According to iKapa Enviroplan and City Think Space (2013), since the western PHA edge is bounded by a 'development route'[130] (Strandfontein Road), this edge should be positioned as a key gateway to the PHA which can make it visible to and integrated with the rest of the City. This edge thus also presents a significant opportunity for exploring the design principles put forward. Thus, it is envisioned that the Schaapkraal edge would be the first phase of the implementation of a 'living urban edge' for the PHA, as will be described in Chapter 5, since it is facing the most urgent threat. A portion of the Schaapkraal edge was selected to represent how a 'living urban edge' would look for the entire edge at an appropriate scale.

Figure 77 below indicates the 'living urban edge' spatially represented across the entire PHA. The 'core' farmlands are protected with a buffer of small-scale farms around the entire perimeter of the PHA. Existing and potential future commercial and agri-processing (industrial) nodes are indicated which can serve as economic drivers for the small-scale farms which make up the 'living urban edge'. It is envisioned that the PHA Campaign Centre (Vegkop Farm) can become an attraction and can create a future community hub around it due to the role it plays in the community outlined in Chapter 3. This community hub can serve as a centre for knowledge-sharing, community mobilization and social networking in order to enhance the cohesiveness of the 'living urban edge' community. Vegkop Farm, as discussed in Chapter 3, aims to act as a model for urban small-scale farming and a peer-to-peer learning space for aspiring small-scale farmers (Sonday, 2019). This can help to share knowledge amongst the small-scale farmers who spearhead the 'living urban edge'.Gateway points are also identified based on the potential of these spaces as crossover points of major activity routes. Major existing recreational attractions are indicated. It is also indicated where these spaces can be better connected to ensure continuous ecological corridors for ecosystem functioning. As previously suggested, these attractions can also be linked with NMT pathways in order to transform the PHA into a destination place of metropolitan scale significance. Scenic routes are also indicated to 'invite' people into the PHA. As discussed in Chapter 3, there is a need for a 'vegetable route' within the PHA which is akin to the Western Cape 'wine route' in order to celebrate the area and reconnect Capetonians with the origins of their food. The scenic routes which move through the PHA 'core' can serve this function. Finally, it is proposed that the CBA in the south-east quadrant of the PHA is reserved as a Protected Area (PA) in order to safeguard the PHA's biodiversity and enhance access to green space within the Cape Flats. This space can become a future attraction.

[130] A development route, according to the CoCT MSDF is an urban corridor of high-intensity urban development which is planned to be serviced by Bus Rapid Transit (BRT) or rail transport services (CoCT, 2018).

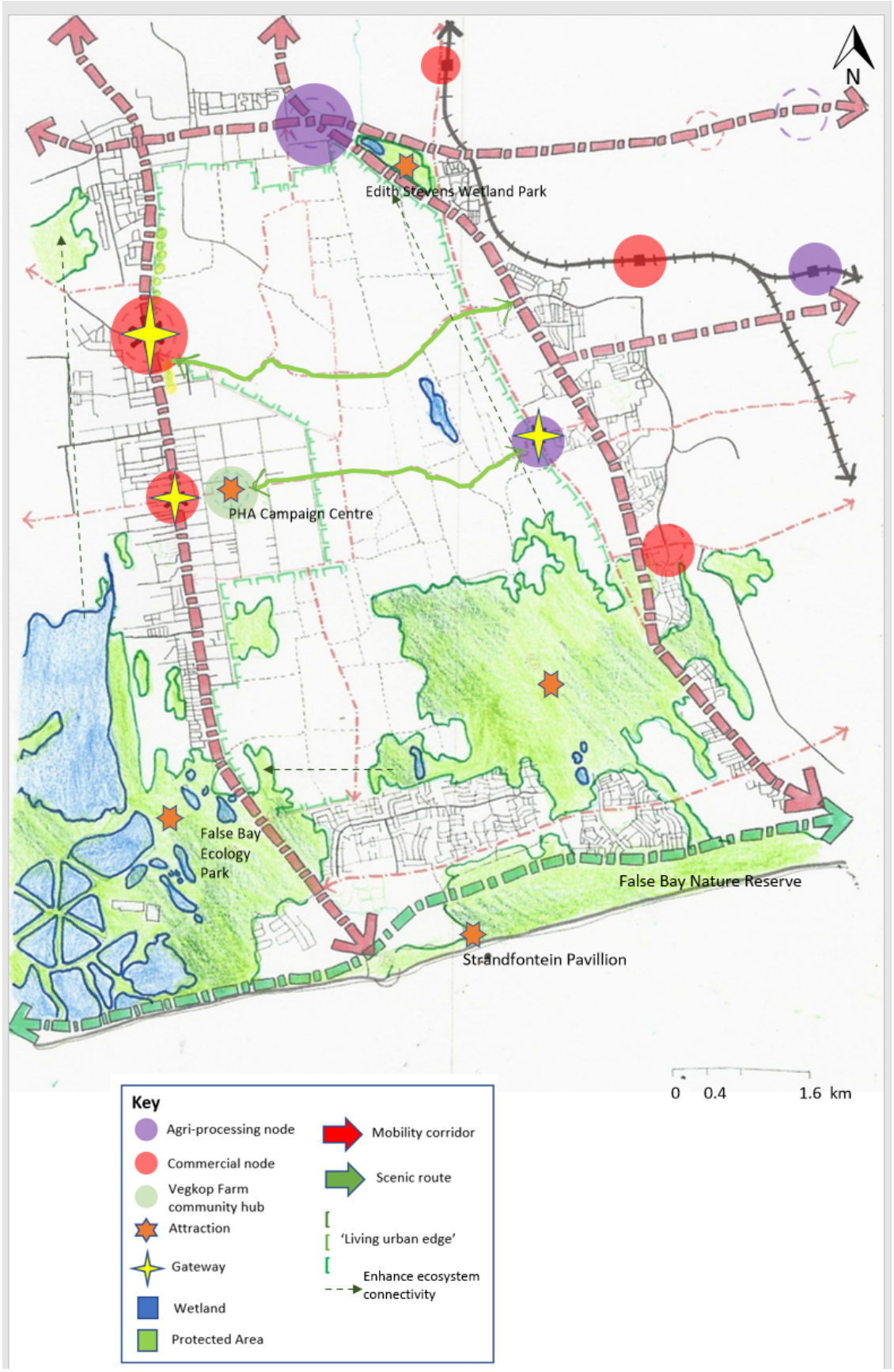

Figure 77: A 'living urban edge' for the PHA. Source: Author's own.

Figure 78ii, as previously mentioned, spatially represents the 'living urban edge' concept in a portion of the Schaapkraal edge. The portion of the edge that is spatialized is indicated on an aerial photograph on Figure 78i.

A buffer area of small-scale farms can create a transitional space and line of defence at the urban-rural interface. This can enhance relationships between people and the farmlands (**Principle 2)**. Small-scale farm plot sizes on the 'living urban edge' are envisioned to be between 0.5-2 hectares. This, according to the PHA Campaign, is an ideal size for small-scale regenerative[131] farming (Focus Group 2, 2021, **Principle 4**). The ecological benefits of small-scale farms were discussed at length in Chapter 2. In addition to this, the benefits of pursuing small-scale agricultural land reform as opposed to the conventional focus on large commercial farms were discussed in Chapter 3. The design principles put forward in Section 1 bolster the case for small farming units on the edge. Smaller farms allow for a more defensible edge, as this will create a higher density of 'eyes on the farmlands' (**Principle 1**). It would also be more difficult for a developer to buy up multiple small-scale farming units owned by different landowners, hence reducing the threat of large, lucrative urban developments enticing politicians to relax the urban edge. In addition to this, smaller farming units will better spatially define the edge (**Principle 5**), as small farm houses can create a visual boundary at the edge. Visual boundaries and defensible space are compounded with a green buffer along the edge, which contains a stormwater swale for the regenerative management of water flows within the site (**Principles 1, 2, 4 and 5).** Existing attractions are highlighted and transformed into nodes of activity which can draw people into the PHA (**Principle 3).** Attraction 1 imagines a cluster of activities centred around the Sonnenstrahl historic farmhouse (see Chapter 2), such as community centres, museums and farmer's and artisan markets. This is depicted in Figure 78iii below.

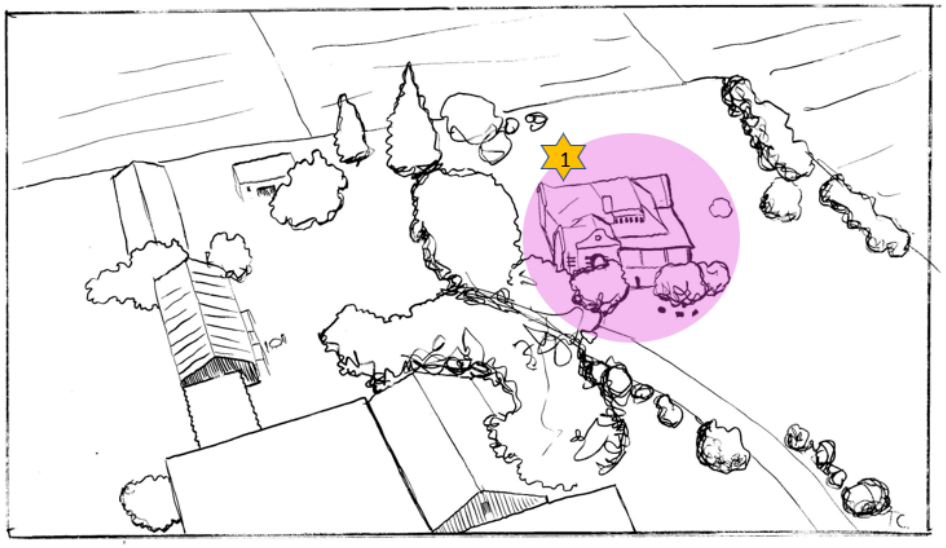

Figure 78iii: an activity node centred around Sonnenstrahl historic farmhouse. Author's own.

[131] As discussed in Chapter 2, small farm sizes necessitate regenerative farming practises in order to function. Monoculture farming is not viable on such small plots.

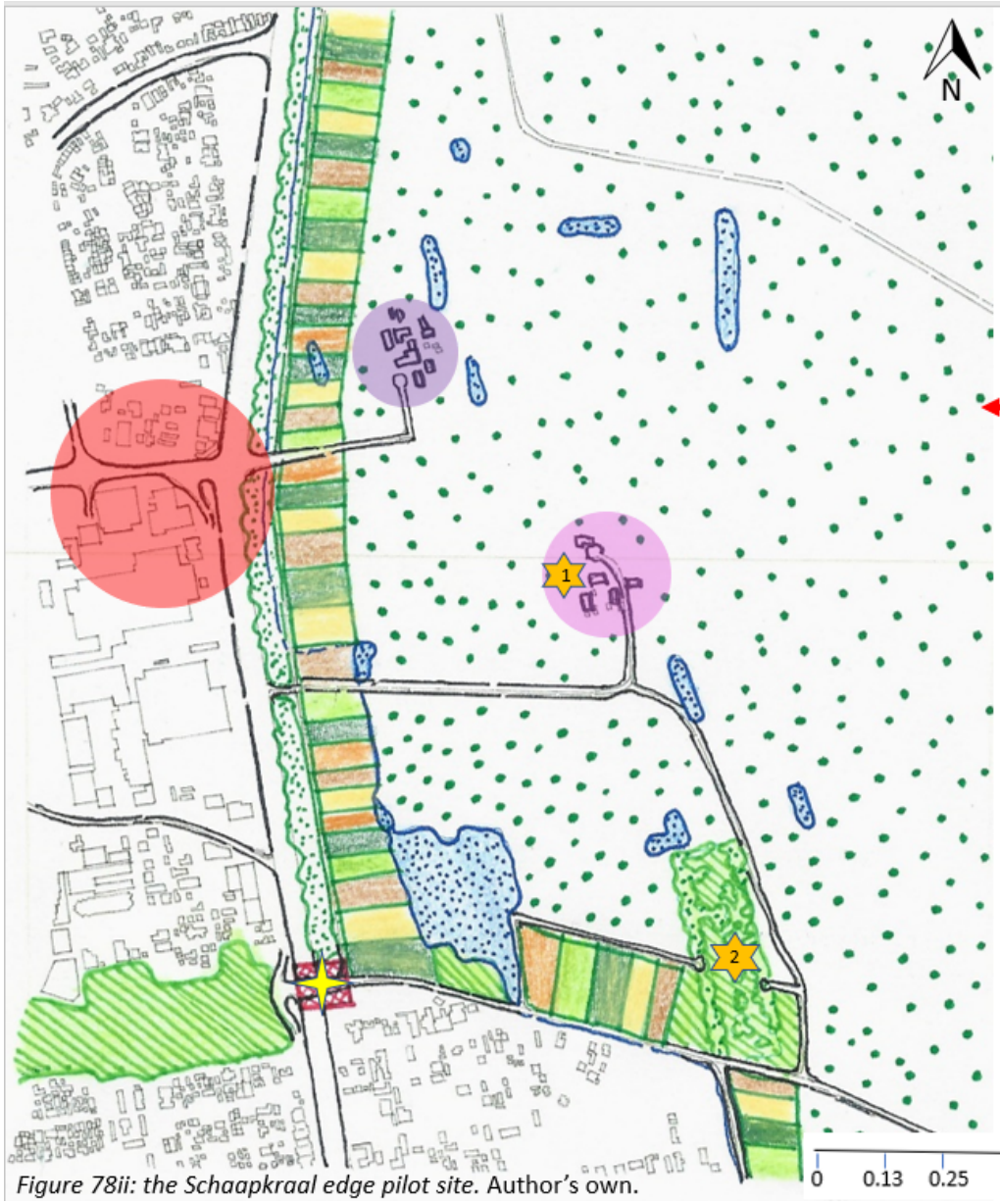

Figure 78ii: the Schaapkraal edge pilot site. Author's own.

Figure 78i: the Schaapkraal edge pilot site located within the PHA. Source: Google Earth satellite imagery

Key

- Agri-services node
- Activity node
- Urban commercial node
- Gateway
- Wetland
- Public open space
- 'Core' farmlands
- Green buffer
- Attraction

Public open spaces enhance the recreational potential of the PHA. Attraction 2 is the Philippi Cemetery, which is also one of the only high points in the PHA. Thus, this location can serve as a viewpoint overlooking the farmlands, as well as a public green space (**Principle 3).** The large wetland on the site is also enhanced with a public green space in order to improve access to natural space within the Cape Flats. A gateway point is indicated, where appropriate attractions can be located as discussed at length in Section 4.2. Finally, an existing urban commercial node (Ottery East) is indicated. Spatial Planner 2 emphasized the fact that it is essential that linkages between producers and consumers are cultivated at the urban-rural interface. There is great potential for encouraging small markets, spaza shops and informal trader bays where fresh produce produced by the farmers who make up the 'living urban edge' can be sold. This can encourage an active interface, improve access to nutrition and enhance the economic viability of small-scale farms. An agri-services node can provide small-scale agri-processing facilities or agri-services which can be used collectively by the 'living urban edge' small-scale farmers.

The following Section will explore how the 'living urban edge' principles can be implemented through land ownership structures. As previously mentioned, it is essential that some institutional structure is in place in order to ensure that the Design Principles outlined in Section 4.2 are upheld. Chapter 2 introduced the idea of a CLT as a means for ensuring the bottom-up defence of green space. The following Section will delve into this idea in the context of the PHA 'living urban edge'.

4.4: Implementing the bottom-up defense of the edge

As discussed in Chapter 3, the Schaapkraal edge was initially subdivided to encourage smallholdings as a 'transitional zone' between urban and rural space at the edge, much like the 'living urban edge' intends. However, due to enforcement issues the area gradually degraded into residential and commercial land uses, hence eroding the character of the PHA. As such, it is essential that a mechanism is in place for enforcing the design principles set up in Section 4.2 from the bottom-up. As discussed in Chapter 2, safeguarding land from the bottom-up necessitates some form of community ownership over land. Conceptually, the idea of holding land under community ownership resists the notion of individualised property rights imposed on the Global South by the West. This is essential since many of the negative land use impacts on the PHA discussed in Chapter 3 are due to the self-interested behaviors of individuals attempting to maximise the economic returns from the ownership of property on the PHA edge. Instead, the argument put forward throughout this dissertation is that if property is held communally and managed by the community it is more likely that the land will be used in a way that benefits the public interest. In addition to this, it would be far more difficult for developers to assemble land parcels for big urban developments in the PHA if the 'living urban edge' properties are community owned.

As discussed in Chapter 2, an emerging tool for enabling the community-led defence of green space is the Community Land Trust (CLT)[132].

Precedent Box 4: the Ontario Farmland Trust (OFT)

In Ontario, Canada's most populous province, citizens have become concerned with the rapid loss of farmland which was occuring as a result of urban sprawl and encroachment (Kucharczyk, 2013). This concern led to the establishment of the Ontario Farmland Trust (OFT) in 2004, which is an organisation that assists landowners and farmers who wish to preserve their land from urban development (OFT, 2019). The OFT focuses on establishing Farmland Easement Agreements with landowners, which are private, permanent legal contracts registered on the property title which restrict land uses to agricultural uses in perpetuity (ibid). Through these efforts, over 1600 acres of farmland are protected throughout the province.

Since CLTs work by "...purchasing land on behalf of the community and holding it in trust in perpetuity", the concept can be used in the case of the PHA 'living urban edge' in order to ensure that the area continues to serve the broader public and ecological interest (Ignaczak, 2013). CLTs are governed by residents, and thus epitomise the bottom-up safeguarding of green space motivated for in Chapter 2. Additionally, certain land use principles and guidelines are attached to the title deed of the land parcels within the CLT. These are enforced by the community, which is a more resilient means of enforcement than concentrating responsibility among a single institution. As discussed in Section 4.2, certain restrictions need to be placed on the 'living urban edge' properties such as a maximum building size for farmhouses to maintain visual permeability at the edge as well as aquifer recharge. As discussed in Chapter 3, in addition to restrictions, positive and proactive conditions should be attached to the title deed of the 'living urban edge' properties, such as mandating that the properties remain actively and regeneratively farmed. It is essential that an organisational intervention such as the CLT is coupled with the 'living urban edge' spatial intervention in order to avoid a similar outcome to what occurred in the Schaapkraal smallholdings area[133]. The PHA Campaign, in Focus Group 2, motivated that this tool can be used to implement the principles of the 'living urban edge.' This idea was inspired by the Islamic concept of 'Waqf', which involves the donation of a fixed asset such as land or a building for the community to benefit from in perpetuity (Bazian, 2012). According to the PHA Campaign, due to the large Islamic community in the neighborhoods surrounding the PHA, leveraging the language of the Waqf can serve as a means towards cultivating community buy-in for the 'living urban edge' intervention (Focus Group 2, 2021). Financing the acquisition of the land that makes up the 'living urban edge' is of course necessary. This will be considered in Chapter 5.

[132]As discussed in Chapter 2, the terminology for land ownership regimes such as CLTs varies. In South African legislation, the term used is Community Property Associations (CPAs). For the sake of consistency, the term CLT was used throughout this dissertation.

[133] As discussed in Chapter 3, the Schaapkraal smallholdings were intended to create a buffer area of small-scale farms along the western edge of the PHA in order to protect the internal farmlands. However, due to unclear and poorly enforced land use regulations, over time the area degraded into residential and commercial space.

4.5: Enabling Policy, Legal and Paradigm shifts

"Alternative futures are not systematically structured within existing regimes" (Thomson & Newman, 2020:1506).

As previously mentioned, the ideas set out in this Chapter won't be adopted without a radical policy shift, and without supporting legislation to aid implementation. Beyond this, the value in preserving the PHA in a regenerative way won't be seen without a paradigm shift. Currently, as argued in Chapters 1 and 2, decision-making paradigms value economic and monetary gains disproportionately. Land is also largely seen as a private, economic good as opposed to a commons, hence creating barriers against the CLT idea expressed in Section 4.4. There is thus a need for cultivating buy-in, especially among policy-makers and political decision-makers for this radical vision.

The following options present opportunities for cultivating buy-in for the ''living urban edge' concept. This will be expanded on in Chapter 5:

- Place marketing should be actively pursued in order to create a public idea of the PHA. Place marketing involves creating an image or a 'brand' which makes a place unique, hence attracting investment. This also supports design Principle 3 (Celebrate the PHA)
- Education regarding regenerative farming and community-building should be actively pursued among aspirant small-scale farmers in the PHA. There is a need for a vision for the PHA which is community-owned. As discussed in Chapter 3 and Section 4.3 (this Chapter), Vegkop farm can serve as a site for building social capital.
- According to a participant in Focus Group 2, the importance of implementing a proactive strategy for safeguarding the PHA can be motivated for to the City by arguing that it will cost the City less to preserve the PHA than it is currently costing it to prevent crime, and how much it will cost to find alternative water supply if the CFA is damaged.

In addition to this, the spatial interventions put forward in Sections 4.2 and 4.3 need to be bolstered by appropriate legislation in order to ensure that the principles of the 'living urban edge' are adhered to.

Firstly, there is a pressing need to bolster the legal protections on the 'core' PHA to halt further erosion of the farmlands. As such, it is proposed that the 'core' PHA area within the MSDF amd the CFDP is expanded to include the south-west and south-east quadrants currently proposed for development due to the agricultural and conservation significance of this land area, as discussed in Chapter 3. This area should remain zoned for Agriculture, and as suggested by Indego Consultants (2018), should be protected by additional overlay zonings such as a Heritage Protection Overlay Zone due to its cultural and social importance (HPOZ). In fact, further legal barriers could be put in place to protect the PHA by declaring the area as a Protected Agricultural Area in terms of the Preservation and Development of Agricultural Land Act.

Precedent Box 5: Lebanon- Groundwater Protection Zone

In Lebanon, the Jeita catchment is the source of a critical aquifer which is severely under threat due to issues with pollution and 'uncontrolled development' (Lebanese Federal Institute for Geosciences and Natural Resources, n.d). As such, the Lebanese government developed a Groundwater Protection Zone in its zoning scheme, with three different zones with different protection needs based on the depth of groundwater (ibid). The shallowest groundwater is most vulnerable and hence requires the most restrictions and protection (ibid).

Beyond this, it is proposed that an Aquifer Protection Overlay Zone (APOZ) is created in the CoCT zoning scheme and applied to all land overlying the CFA (see precedent Box 5). This can assist in mandating, for example, organic farming practises in order to prevent groundwater contamination. WSUD principles such as using swales for stormwater management and minimizing the built footprint to enable groundwater recharge can also be a part of the APOZ regulations. This can help hold individuals who are not part of the 'living urban edge' CLT to account and ensure that large commercial farmers are also protecting the aquifer and the farms. As mentioned in Chapter 3, currently when illegal dumping occurs in the PHA (which severely threatens aquifer quality), the approach is reactive in that a fine is merely issued to the offender. Thus, it is proposed that within the APOZ regulations, provisions should be made that if illegal dumping, or other activities which threaten the aquifer occur, the offender should be held responsible for rehabilitating and restoring the environment. This approach is more in line with the notion of regenerative development.

Another option for ensuring that the 'living urban edge' principles are adhered to is through the Local Area Overlay zone (LAO) in Part 5 of the CoCT MPBL zoning scheme. The purpose of LAO zones is to "...provide opportunities for the City to apply specific local development rules that reflect local circumstances" (CoCT, 2015:156). However, currently all areas subject to LAO provisions are wealthy parts of the City, indicating that this legal mechanism arguably only serves to protect the property values of a limited set of elite interests. Mobilizing this mechanism contained within the MPBL can provide another layer of legal protections aimed at safeguarding the landscape character of the PHA, and can ensure that properties on the PHA edge are managed according to the principles set out in Section 4.2. Additionally, as mentioned in Chapter 3, a major issue in the PHA currently is the fact that the zoning scheme does not positively enforce that the area must be actively farmed. Instead, land uses which are not permitted are merely stated. This allows residents to buy farming plots and use them for purely residential properties or for developers to speculate on plots and leave them to lie fallow. This is destroying the character, ecological functioning and productivity of the farmlands. Thus, it is proposed that within the LAO regulations for the PHA, proactive guidelines should be put in place which, for example, demand that a designated land area of all properties be used for regenerative farming purposes. Spatial Planner 2 also noted that in the Drakenstein municipality (South Africa), preferential rates have been given to farmers at the urban-rural interface who have continued farming in order to discourage land use change. This could be another option for proactively ensuring that landowners in the PHA continue to farm.

It is also essential that the MPBL is amended to better facilitate and allow for informal trading at the edge. As previously mentioned, it is essential that the informal trade of fresh produce is part

of the ‘living urban edge’ strategy. This allows small-scale farmers to tap into an economic niche which is more viable for their scale of production. It would also be difficult for small-scale farmers to compete with established commercial farmers for access to supermarkets. This also requires a paradigm shift towards seeing the value of street and informal traders in enhancing the access of the poor to affordable nutrition (Ho, 2021). Currently, policymakers and South African planning legislation are on the whole unsupportive of the informal food systems (Ho, 2021). In fact, informal food traders are often criminalized, facing fines and the confiscation of produce (ibid). This was clear in the COVID-19 lockdown, where large-scale supermarkets were able to remain open as ‘essential services’, yet street and bakkie traders were prevented from trading, hence blocking the market access of small-scale farmers (ibid). Overall, obtaining permits to trade is onerous and expensive, forcing many traders to operate illegally and hence face the risk of fines and confiscation (Steyn & Mokoena, 2020). There is no chance for obtaining a permit in the Agricultural (AG) or Rural (RU) zones, hence preventing traders from operating legally within the PHA (CoCT, 2015). Thus, it is proposed that the LAO zone for the PHA previously discussed permits the informal sale of produce as a land use right not requiring the permit process.

4.6: Areas for Further Investigation: Alternative Edge Typologies

Alternative typologies for the ‘living urban edge’ should be investigated, since as discussed in Chapter 3, each edge of the PHA is characterized by vastly different urban dynamics. Whilst fully spatializing and conceptualizing these alternative typologies is not within the scope of this research, this Section will introduce a possibility for an alternative ‘living urban edge’ typology in order to gesture towards the vast possibilities that the ‘living urban edge’ spatial concept offers. To this end, the Weltevreden Wedge (eastern edge of the PHA) will be explored. As discovered in Chapter 3, the Weltevreden Wedge has never been historically farmed, except for a small land area in the south. As such, the area presents a different reality to the other PHA edges and thus offers an opportunity for exploring a different ‘living urban edge’ typology to the one proposed for the Schaapkraal edge in Section 4.3, still based on the same principles outlined in Section 4.2.

As discussed in Chapter 3, the Weltevreden Wedge remains underutilized and spatially ambiguous, and as such has been subject to urban encroachment and illegal land use. In addition to this, the area has been earmarked for housing provision, a commitment which has yet to be followed through on (Spatial Planner 2). It is important that any plans for the future of the PHA are cognizant of the fact that informal settlements have developed on the edge which, due to poor basic services and infrastructure, threaten the ecological integrity of the area and the health and safety of residents. In addition to this, the urban development pressure on the PHA will not subside unless the lack of quality social housing throughout the City is resolved (Focus Group 2, 2021). As such, future plans for the PHA need to provide alternative housing options for these residents. Since many of the informal settlement residents on the edge of the PHA are evicted farmworkers, with interest and skills in farming, it becomes possible to integrate social housing and small-scale farming in accommodating these residents (Indego Consultants, 2018). It is thus proposed that the Weltevreden Wedge is considered for medium density

housing of rural character with community allotment[134] garden spaces available to the residents. This can maintain the character of the area (**Principle 3),** reduce separation between the urban and the rural (**Principle 2**) and spatially define and defend the edge (**Principles 1 and 5**). In the midst of the COVID-19 Pandemic, as previously discussed, there has been a significant uptake in this way of thinking about living in the City, and as such there is a growing likelihood that this form of housing provision could be supported by policymakers (Focus Group 2[135], Adams et al, 2013).

Figure 79 represents this idea for an alternative 'living urban edge' conceptually. Medium density housing with shared community allotments for farming can create a buffer against further development encroachment. A buffer of small-scale farms and green infrastructure creates a further line of defence against the PHA 'core'. Existing agri-processing nodes (indicated on Figure 77 in Section 4.3) are enhanced to create agri-servicing hubs for the internal farms and small-scale farms, and provide job opportunities for edge residents. Urban nodes on Jakes Gerwel Drive create 'gateways' into the PHA which are enhanced with attractions such as public markets.

[134] Allotment gardens, as opposed to small-scale farm plots, are chosen to allow for flexibility since not all residents in the housing complex will be interested in farming.
[135] As articulated by a PHA Campaign member, "If you put that message out now, it will fall on receptive ears."

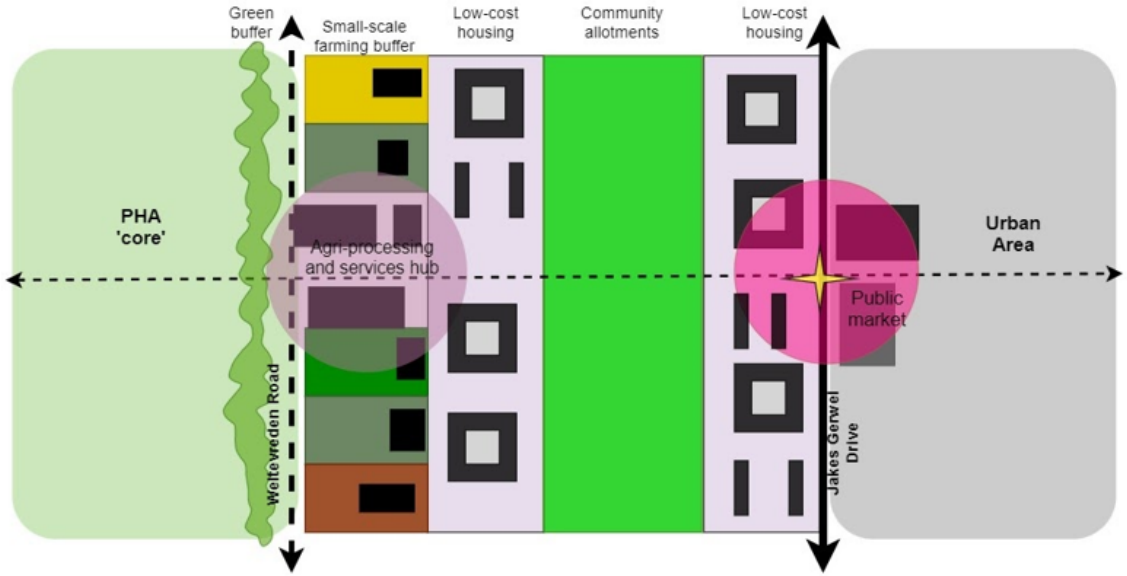

Figure 79ii: an initial conceptual diagram indicating the possibility of alternative 'living urban edge' typologies. Author's own.

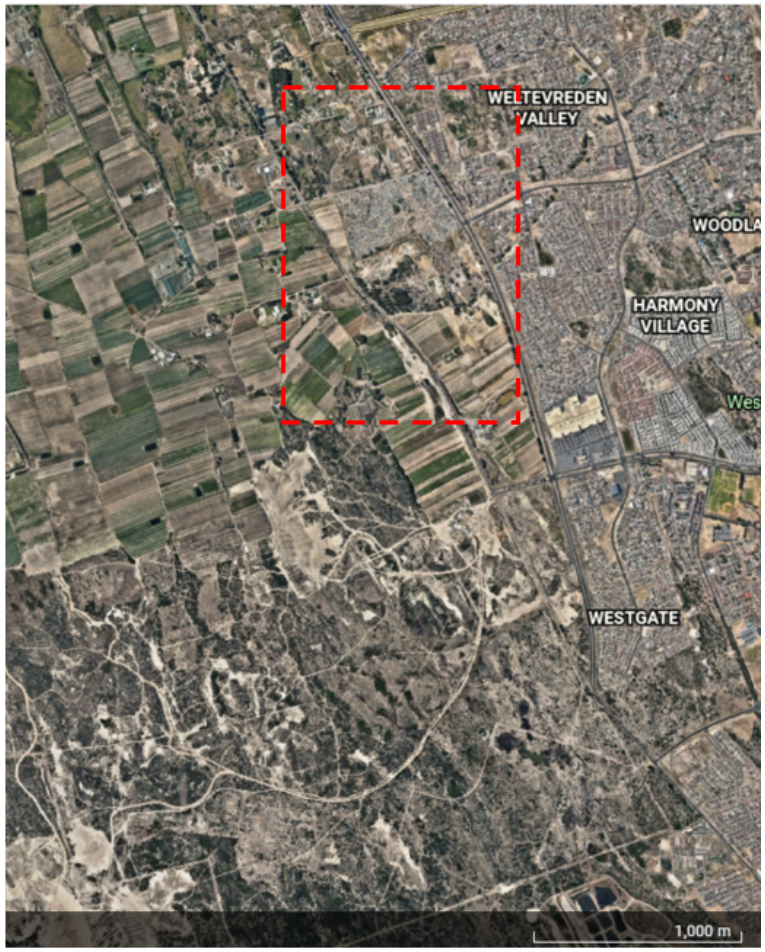

Figure 79i: the concept in Figure 79ii located within the PHA.
Source: Google Earth satellite imagery

According to Battersby and Marshak (2014), the modernist paradigm discussed in Chapters 2 and 3 has characterized the provision of social housing in the post-apartheid era, where 'deadened' environments have been created with very little sense of community. In addition to this, the PHA Campaign criticized traditional housing delivery in Focus Group 2 for merely focusing on housing and a place to live, and in doing so other important aspects of wellbeing such as recreation and play, livelihoods, food sovereignty and security and access to nature are overlooked. This is despite the fact that, as expressed in Chapter 3, apartheid spatial planning did not just dispossess people of land and housing but also severed people from access to nature and the ability to cultivate self-reliance through food growing. Thus, exploring the interface between the need for housing delivery and the need to conserve urban agricultural space is both a means towards resolving the development conflict at the edge and towards attaining post-apartheid spatial justice. This offers benefits for both people and the environment, hence characterising regenerative development.

As previously mentioned, including provision for the human settlement needs of farmworkers and informal settlement residents on the edge is essential for resolving an aspect of the development pressure on the PHA through spatial planning intervention (Indego Consultants, 2018), According to Indego Consultants (2018), "The formalisation of the Weltevreden Wedge and the integration of urban agriculture design principles into the human settlements developments could create a strong eastern buffer for the PHA and a recognized gateway into the PHA." The 2021 Draft CFDP confirms this sentiment, arguing that medium density mixed-use development should be encouraged in this area, and that a positive and enlivened interface with Weltevreden Road should be encouraged to create a scenic route along this road (CoCT, 2021). Spatial Planner 2 confirmed this sentiment, arguing that the Weltevreden Wedge can serve as a pilot project for exploring a new approach to social housing provision in the City.

Whilst this edge typology, and possible other edge typologies fall outside the scope of this research, it is important to flag the possibility of exploring alternative edge typologies for further investigation. This will be addressed again in Chapters 5 and 6.

4.7: Conclusion

This Chapter has presented a conceptual approach and spatial framework for the proactive design of the urban-rural interface, with a focus on cultivating a regenerative relationship between the urban and the rural. Additionally, the concept aims to combat the threat of development encroachment in response to the shortcomings of the current approach. To this end, 5 key design principles for the PHA edge were put forward. The hope is that these principles can guide the proactive implementation of a 'living urban edge' around the perimeter of the whole PHA, where a buffer of small-scale farms[136] can stand in defence of the farmlands, and create a more active and legible urban-rural interface. Through this, regenerative development can be realized by providing livelihood, health and psychological benefits to the PHA community, the Cape Flats District and the broader Cape Town metropolitan area; as well

[136] Or alternative typologies, as discussed in Section 4.6, where appropriate and subject to further research.

as multiple benefits to the natural realm. Since the ‘living urban edge’ idea is conceptual in nature, it can be applied to other contexts and adjusted to suit local dynamics. As such, there is potential for the concept to be applied to other spaces facing urban development encroachment issues which, as discussed in Chapter 2, is a globally prevalent issue. Within the CoCT, for example, urban development encroachment is a persistent issue across the entire metropolitan edge. As such, the applicability of the ‘living urban edge’ concept to this edge, and spaces beyond the CoCT, should be investigated.

Chapter 5: Implementation Framework

5.1: Introduction

This Chapter aims to gesture towards how the 'living urban edge' concept might be implemented in the PHA. To this end, this Chapter will discuss the factors which can contribute to successful implementation. Namely, the need for creating partnerships between various stakeholders will be discussed in Section 5.2 Following this, the benefits of a phased approach where interventions are rolled out incrementally will be outlined in Section 5.3. In Section 5.3, various short-term, medium-term and long-term priority actions will also be identified, along with the funding options, supporting legislation and responsible stakeholders involved in the implementation of each catalytic project. Finally, concluding remarks will be made in Section 5.4.

5.2: Institutional Arrangements- Partnerships

"How could the role of the designer and planner become less concerned with controlling the final design and more aimed at providing the tools and methods...and act(ing) as catalysts to promote participatory and citizen-driven models for the creation of sustainable neighbourhoods"
(Dubbeling et al, 2016:39).

This dissertation has argued for a change in the current top-down, state-led approach to safeguarding urban green space from development encroachment, which has proven to be ineffective, towards a community-enforced urban edge. As such, it is essential that the PHA community drives the 'living urban edge' process in line with theories of bottom-up planning outlined in Chapter 2. There is also a need to engage in a productive dialogue between the diverse and often competing interests at the root of the pressures facing the PHA landscape, and a need to move beyond expert-led processes and towards the foregrounding of local knowledge and mobilization.

However, the implementation of the 'living urban edge' cannot be the role of the local community alone. According to research undertaken by Tembo and Louw (2013:224), a key component of the successful implementation of existing community urban agriculture projects in the Cape Flats is the use of partnerships. This was corroborated in Chapter 2 Section 2.4.3, where the global use of CLTs (termed CPAs in South Africa) was discussed. It was found that when the local community does not have the resources to purchase land and hold it under trust, it is necessary for the state, the private sector or NGOs to provide funding support. Since in many cases small-scale urban farmers do not have access to capital, the support of other actors such as Non-Government Organizations (NGOs), the state and the private sector is essential. In Focus Group 2, PHA Campaign members emphasized that the organization does not have access to sufficient funding for implementing its vision for the PHA, and as such partnerships need to be cultivated if this vision is to be achieved. Thus, it is envisioned that the

implementation of the 'living urban edge' concept is spearheaded from the bottom-up, but with government, NGO and private sector roleplayers playing a supportive role. This coheres with Ostrom's idea of co-production in planning, as discussed in Chapter 2.

5.2.1: Key Stakeholders

The following subsections will outline the key stakeholders who could be involved in implementing the 'living urban edge' proposal.

5.2.1.1: Community

As previously mentioned, a priority in implementing the 'living urban edge' concept is ensuring that the process is community owned and driven. An extensive argument for the merits of this approach has been made throughout this dissertation. The argument was made that communities are a more resilient and reliable means through which to safeguard land from development encroachment than traditional top-down enforcement. In addition to this, it was argued that embedding communities in the landscape provides multiple social, ecological and economic benefits. Beyond this, and specifically pertaining to the implementation process, Olivier and Heinecken (2017:170) refer to the importance of community groups in facilitating the sharing of knowledge, resources and support between small-scale farmers and surrounding communities. They term this role as the formation of 'bridging capital', which are the networks that bind diverse communities together (ibid).

Dubbeling et al (2016) emphasize the importance of extensive public participation in implementation at various stages of community urban agriculture projects as a means towards cultivating a sense of ownership, from initial visioning to monitoring and evaluation (see Figure 82). Due to the diverse communities present in the PHA space, it is essential that a public participation process is followed in order to facilitate the mediation of the conflicting interests at the root of the tensions facing the area, and to ensure that all voices are heard in the implementation process. Beyond individual citizens, civil society groups such as churches, mosques, the media and advocacy groups have a critical role to play in implementing the 'living urban edge' concept. As previously discussed, these groups are essential for disseminating knowledge, engaging the public and cultivating community buy-in.

However, it is important to reiterate that whilst the 'living urban edge' is aimed to be pioneered and owned by the local community, it is also essential that the implementation process is facilitated by the public sector at all levels. As argued by Frantzeskaki et al (2018:281), the danger in involving civil society in facilitating regenerative transitions is that a situation can be created where governments entirely avoid or limit their responsibility in resolving the persistent structural issues behind the current ecological crisis. Thus, it is essential to clearly define the state's responsibility in the implementation of the 'living urban edge' spatial concept and principles. Ín addition to this, due to the tensions present between the diverse stakeholders in the PHA space, it is important to have a regulating body in place to constantly monitor

processes, include voices and mediate conflict. The following subsection will expand on this role of the state.

5.2.1.2: Government

The support of the three spheres of government can provide funding sources, capital and extension services to the PHA community to aid them in implementing the 'living urban edge.' Additionally, as discussed in Chapter 4 Section 4.5, the state can assist in implementing the 'living urban edge' by creating an enabling policy and legislative environment. According to the National Growth and Development Plan (2012), the participation of all spheres of government in food system and security planning is essential (Olivier & Heinecken, 2017). This is due to the important role of each sphere, which will be outlined shortly. In addition to this, interdepartmental collaboration and the dissolution of silos is essential for the successful implementation of the 'living urban edge' concept, due to the cross-cutting issues faced in the PHA.

According to Haysom (2021:299), the state is responsible for engaging with the management of food systems since the South African Constitution establishes food as an essential public good. In addition to this, the Constitutional right to water demands that the government engages in proactively safeguarding the long-term future of water resources such as the CFA. In this, the 'living urban edge' proposal is strengthened by its ability to ensure that constitutional mandates are followed through on. In the wake of the COVID-19 crisis which has staggered the global economy, public health and food security, it is becoming increasingly likely that government stakeholders will see the value in supporting urban food growing initiatives and in so doing honor these constitutional mandates. This was discussed at length in Chapter 2, where it was found that in times of economic and social crisis, the value of urban farming becomes increasingly visible to citizens and policy makers. This was the case in Argentina where, following the 2001 economic crisis, policy support for urban agriculture burgeoned (Dubbeling et al, 2016). The hope is that this present crisis will jolt the public sector into supporting initiatives such as the PHA 'living urban edge.' This has already been the case in the CoCT, where in 2021 the Urban Agriculture Programme[137] was established as a part of the broader Mayoral Urban Renewal Programme (Tshuma, 2021). This Programme has released R3 million of government funds for cultivating and supporting food gardens in Cape Town (ibid). It is recommended that this opportunity and moment is leveraged as an opening into exploring alternative, more regenerative planning approaches such as the 'living urban edge'. In addition to this, as discussed in Chapters 3 and 4, the PHA presents a valuable opportunity for exploring new approaches to land reform and housing delivery. This bolsters the need to include government stakeholders in the implementation process.

It is important to note here that, as discussed in Chapters 2 and 3, the lack of a clear mandate for urban agriculture planning and governance is a major barrier in the implementation of projects relating to urban food growing. As such, it is essential that the implementation strategy

[137] There is an opportunity to motivate for the inclusion of the implementation of the 'living urban edge' as part of this initiative. As such, this initiative is mentioned in Tables 1-3 as an important source of funding support.

put forward to this project takes cognizance of the need to create government accountability and responsibility in proactively managing urban agricultural space. Additionally, it is also important to note upfront that the support of the public sector is entirely dependent on political will and the existence of political champions.

The following subsections will further divulge the role of each government sphere:

i) National Sphere

Broadly, the national government needs to create an enabling policy environment which makes food security, climate change resilience and ecological protection a national priority. Since the national sphere delivers fiscal policy, a supportive policy environment at the national scale is essential for funding projects such as the 'living urban edge'.

As discussed in Chapters 3 and 4, the PHA is well-positioned for the implementation of a new approach to land reform, where small-scale farming is supported in proximity to urban space. Including the implementation of the 'living urban edge' as a component of the National Land Reform Project can assist in the provision of funding and institutional support. As such, the National Department of Agriculture, Land Reform and Rural Development [DALRRD] is an essential stakeholder within the national sphere of government. In addition to this, currently the DALRRD is the principal government department with a mandate over food security (Haysom, 2021:299). However, as will be discussed shortly, this concentration of responsibility within national government entrenches the rural-urban dichotomy within organisational structures. In addition to this, the existing institutional mandate in food security planning drives fiscal allocations, leading to a lack of funding for resolving localised urban food system issues (Haysom, 2021:300). Thus, provincial and local governments need to be better included in planning for regenerative food systems. This can enable the more localised and place-based interventions needed to protect agricultural space in urban contexts, with the support of the national government.

ii) Provincial Sphere

The management of agricultural and ecological resources is a core competency of the provincial government, thus making the provincial sphere a key roleplayer in the implementation of the 'living urban edge.' Additionally, the Western Cape Department of Human Settlements (DHS) is also a potential implementing agent. This is due to the argument put forward in Chapter 4 that there is room for exploring the implementation of the 'living urban edge' through the delivery of sensitively designed and context-appropriate housing, subject to further investigation. More indirectly, the provincial role in housing provision is an essential part of resolving the urban pressures on the PHA due to burgeoning informal settlements on the edge resulting from the systemic affordable housing shortage in the CoCT. If alternative housing options are not provided to informal settlement residents, these settlements will continue to grow and encroach on open space in the City.

Since 2009, the Western Cape Department of Agriculture has run the Comprehensive Agricultural Support Programme (CASP), which is a national governmental initiative which provides provincial government with funding in order to improve its capacity to support farmers (Western Cape Government, 2019). CASP provides funding support to small-scale and commercial farmers, and as such can be leveraged to fund the acquisition of land and capital for the 'living urban edge'.

iii) Local Sphere

Precedent Box 6: Food Security Governance, Belo Horizonte, Brazil.

In response to rapid, sprawling urbanization and the related displacement of food systems, the Brazilian city of Belo Horizonte created a municipal department (the Municipal Secretariat of Supply) responsible for securing food security and sovereignty, with a strong focus on spatial planning (Battersby, Haysom & Park-Ross, 2020:60). This led to the creation of the Belo Horizonte Food Security Program (BHFSP), which aims to connect locally produced food with urban consumers (ibid). This focus on food security planning in Belo Horizonte emerged from a broader countrywide citizen movement called the 'Citizenship Action against Hunger, Poverty and for Life' in 1993, indicating the power of mobilized communities in shifting paradigms (Future Policy, 2020). The newly established food governance body is multidisciplinary and is inclusive of diverse stakeholders such as citizen groups, research institutions, labour unions and food producers (ibid). This precedent thus epitomizes the partnership approach advocated for in this Section 5.2.1. Brazil has "...become the international benchmark for measuring national commitment to food security" (Food and Agriculture Organization [FAO], 2015). The national government launched a Zero Hunger programme in 2003, and since then the number of food insecure individuals decreased by 40% (ibid). This reiterates the importance of an enabling policy environment at a national level in the pursuit of urban food security and sovereignty as discussed in Section 5.2.1. Belo Horizonte has also pioneered unique ways of gaining community buy-in and awareness. School gardens have been established, where children attend workshops and construct and maintain vegetable gardens which can enable environmental and food education (FAO, 2015). The municipality also hosts a vibrant "urban agriculture fair" weekly on municipal land, which enables small-scale farmers to sell their products (ibid).

As previously discussed, it is essential that the local government is better involved in food system planning, especially with regards to urban agricultural space. This is especially due to the role of local governments in determining land use, which directly impacts the food system due to the prevalent issue of urban development encroachment on peri-urban land (Haysom, 2021:303). Dubbeling et al (2016:38) reiterate this idea by arguing that, "To reconcile the needs posed by urban growth with the needs for activities of potentially high economic and social value, urban agriculture should be included in urban development and land use plans and be regulated by municipalities."

However, as discussed in Chapter 3, the attainment of food security and sovereignty is currently an unclear and unfunded mandate in South African urban local municipalities. Battersby, Haysom and Park-Ross (2020) argue that whilst local governments may not receive national funds for food system planning, it is possible for local municipalities to engage with urban food security and systems through 'Food Sensitive Planning and Urban Design (FSPUD).' FSPUD aims to cultivate relationships between urban planning and food systems, an area which the planning profession has failed to sufficiently engage with (Morgan, 2012). The CoCT, compared to other local municipalities in South Africa, is fairly supportive of localized urban agriculture in its policies. Cape Town is currently the only South African city with an urban agriculture policy[138] in place (Kanosvamhira, 2018). However, there is still a lack of a

[138] See the Urban Agricultural Policy for the City of Cape Town (2007)

responsible local government body for the planning and design of urban agricultural space. Thus, it is proposed that the CoCT creates a sub-department within the existing Department of Urban Planning and Design that is responsible for the management of urban food-growing space. It is suggested that this department is called the **Municipal Directorate of Integrated[139] Urban Food Systems Planning.** This can also help with the issue of poor enforcement of land use regulations in the PHA, as discussed in Chapter 3. As argued by Haysom (2021:292) it is essential that food governance is driven through the urban planning department, as creating an entirely separate department or ministry of food will perpetuate the traditional silos within local government. This negates the integrated approach that this dissertation has argued for throughout. Urban planning, alternatively, is sectorally cross-cutting and long-term in its focus, and thus is ideally suited for creating this integrated approach (Haysom, 2021). Precedent Box 6 provides insights regarding how cultivating a responsible governance structure for ensuring food security can be implemented. However, these governance interventions cannot be achieved without political champions who are concerned with issues of food security, sovereignty and climate change resilience.

Public procurement of goods produced on the small-scale farms which make up the 'living urban edge' for school feeding programmes or government food schemes (FAO, 2015). This was the case in the Belo Horizonte (Brazil) precedent study (Precedent Box 6). The municipal government of Belo Horizonte made public procurement of food from small-scale local farmers mandatory by law (ibid). In this, public procurement of produce can enhance the economic viability of small-scale farms on the edge.

5.2.1.3: Non-Government Organizations (NGOs)

According to Olivier and Heinecken (2017), NGOs in the CoCT are mobilizing significantly[140] in support of regenerative urban agriculture through offering funding, extension services and capacity building services such as training in producing organic compost. In addition to this, the authors argue that NGOs in Cape Town have played a significant role in facilitating the formation of 'bridging capital' between small-scale farmers. NGOs are also critical for linking communities with government power structures and private sector markets and resources which are otherwise difficult for citizens to access (Olivier & Heinecken, 2017:171). All of these roles are essential because they enhance the viability and functioning of urban small-scale farms. The farms that make up the 'living urban edge' require this support because if they are not economically viable, citizen and state buy-in will be difficult to garner, and the project will be unsustainable. In the PHA, as discussed in Chapter 3, the PHA Campaign is serving many of these purposes, but partnerships with other NGOs can enable an integrated approach and can allow the PHA Campaign to bolster the support it hopes to provide to small-scale farmers.

[139] The word 'integrated' is selected in order to encourage a cross-sectoral approach to food systems planning which considers the intersections between food systems, natural systems, social systems and economic systems.

[140] According to research undertaken by Olivier and Heinecken (2017:171), in 2013 there were at least 134 NGOs engaged in supporting urban farming in Cape Town. Given the rise of food security concerns due to the current COVID-19 pandemic, as previously discussed, it is likely that this number is higher at present.

The ‘living urban edge’ intervention is inspired by regenerative development and as such strives to create multiple benefits for both people and ecology. As a result, the support of NGOs working in diverse sectors can be garnered, from conservation groups to economic development organizations. Especially significant for supporting developmental initiatives in the Philippi area is the Philippi Economic Development Initiative (PEDI, since 1998). PEDI was established in a partnership between the CoCT, the Western Cape Government, the private sector and the local community, and focuses on leveraging economic development in the Philippi area (PEDI, n.d). Hence, PEDI represents the partnership approach motivated for in Section 5.2.1. One of the organisation's key focus areas is the support of the agricultural sector, and thus PEDI can be a significant roleplayer in enhancing the livelihood opportunities and economic viability of the small-scale farms which make up the ‘living urban edge’ (ibid). According to Spatial Planner 2, PEDI can serve as a crucial linkage for small-scale farmers on the PHA edge to access suitable markets and finance. In addition to this economic development organisations such as GreenCape, who focus on promoting the green economy in Cape Town, can be mobilized as a source of funding[141] and a linkage to the private sector. International organizations, donors and projects[142] should also be turned to for expert advice, funding and other resources such as volunteers. Figure 80 provides more detail and examples of possible NGOs that could support the ‘living urban edge’.

5.2.1.4: Private Sector

As mentioned in Chapter 3, most of the land in the PHA is currently privately owned. As such, it is necessary to engage private developers and landowners in order to release the land on the PHA edge. In Focus Group 2, it was proposed that land swaps can be offered to developers. This is a process usually applied to the case of affordable housing where the City trades land rights, fast tracked development processes or other incentives for desirable land such as the land on the PHA edge. However, this is a difficult process and extensive further research must be undertaken to explore how to make these trades desirable for developers. If the ‘living urban edge’ is implemented through land reform, then state land expropriation also offers an option for acquiring land on the edge (Ngcukaitobi, 2018).

In addition to this, it was mentioned in Focus Group 2 that mutually beneficial relationships between private developers on the PHA edge and small-scale farmers can be encouraged. Campaign members commented that since developers hoping to urbanize the PHA edge have faced such constant activist opposition, some have approached the PHA Campaign in the hope of seeking advice on how their use of the land can be planned in such a way that it is acceptable to the PHA Campaign and the state, and provides return on the developer’s investment. Such arrangements are possible through, for example, allowing for some higher

[141] For example through the Green Outcomes Fund, which focuses on incentivising South African fund managers to increase investment in green small businesses.
[142] For example, project leads of the precedent projects discussed in Chapter 4 can be approached for advice, and international food security organizations such as the Food and Agriculture Organization (FAO) can be approached for funding support.

Precedent Box 7: Mooiwater development, Franshoek, Western Cape (South Africa)

An innovative housing project undertaken in partnership by the Western Cape Human Settlements Department and the Stellenbosch Local Municipality (the local administration of Franshoek), a civil society group (the Franshoek Development Forum) and the private sector offers inspiration for implementation strategies. In Franshoek, housing prices and investment in property is accelerating due to the desire to live in a scenic rural environment (Johnston, 2006). The project saw the creation of 1000 sustainable low-cost houses on municipal commonage land, which were cross-subsidized by high value lifestyle properties, thus developing a mixed-income residential space (ibid). The development includes a community farm which is owned 50% by a workers trust, and a fynbos propagation nursery which allows community members to simultaneously obtain livelihoods and conserve biodiversity (ibid).

property value lifestyle farm properties as part of the living urban edge as a way to cross-subsidize affordable properties. Precedent Box 7 provides more detail on how this process could be implemented, but this is again a matter that should be researched further in terms of how it could be implemented as part of the 'living urban edge' proposal.

Finally, as has been previously discussed, the private sector is an essential roleplayer in terms of making the proposed 'living urban edge' small-scale farms economically viable. Incentives should be provided to integrate small-scale farmers into the CoCT food supply chain, such as through organic produce 'box' schemes, markets, restaurants, farm stalls or niche indigenous food products. Additionally, PHA commercial farmers can support aspirant small-scale farmers with expertise, equipment, produce transport or through providing shared access to agri-processing facilities.

Figure 80 (overleaf) maps the stakeholders who can form partnerships in implementing the 'living urban edge' concept. The purpose of the figure is not to present an exhaustive list of all stakeholders that could implement the 'living urban edge'. Rather, the intention is to indicate the vast possibility and potential of engaging a diverse set of stakeholders in implementing the 'living urban edge.

Figure 81 (overleaf) outlines the diverse roles played by each stakeholder group. Importantly, each implementation role is supported by multiple stakeholders. This is a benefit of the partnership approach, as each essential implementation function is fulfilled by multiple actors. This aids the resilience of the implementation process because if one stakeholder group fails to sufficiently fulfill their role, the role can still be fulfilled by other stakeholders.

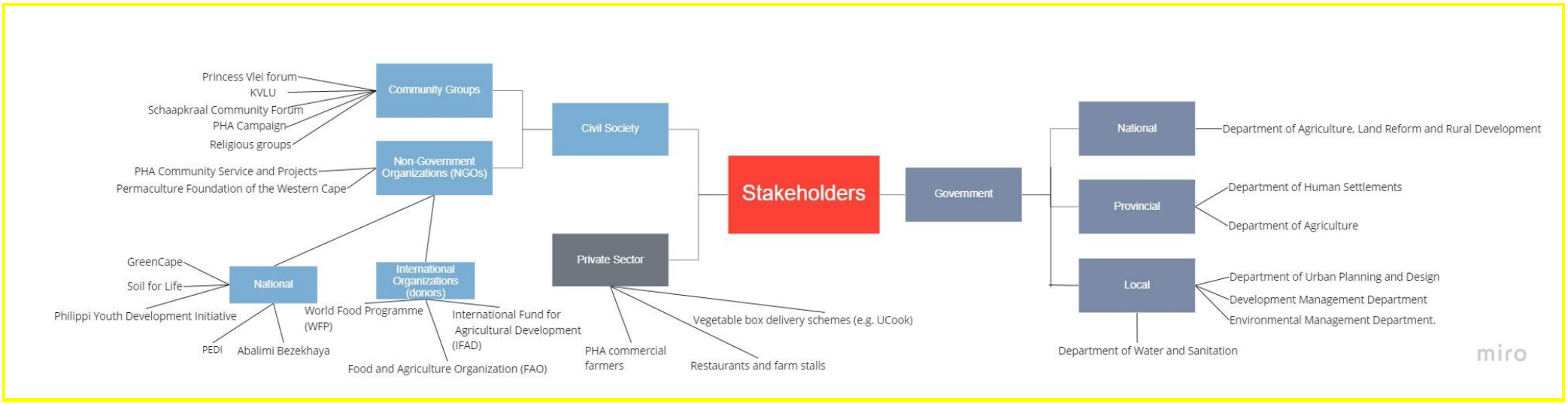

Figure 80: Stakeholder map for implementing the 'living urban edge'. Author's own.

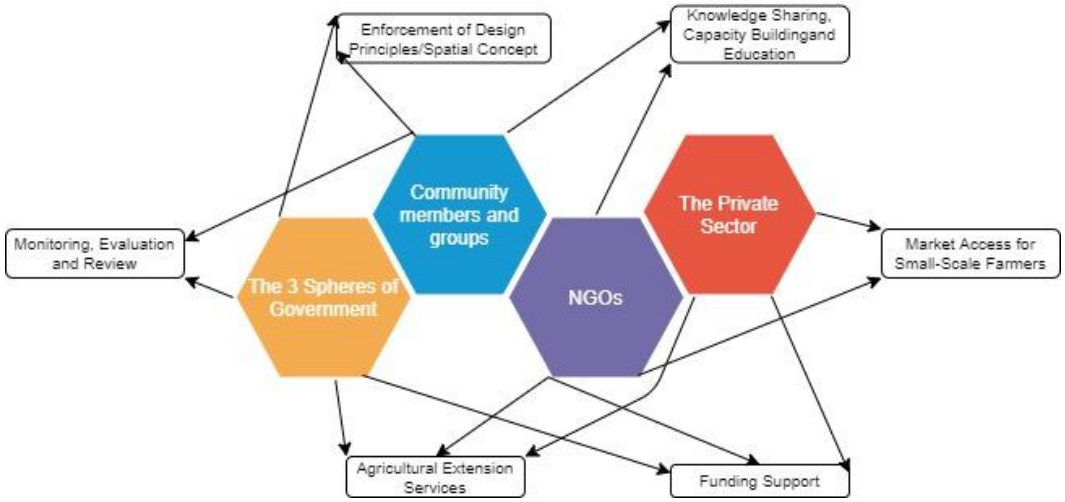

Figure 81: Stakeholder roles in implementation. Author's own.

5.3: A Phased Approach to Implementation

As previously mentioned, it is proposed that a phased approach is taken for rolling out the intervention put forward in Chapter 4. Namely, there are two main components to the intervention: the 'living urban edge' spatial concept and design principles, and the enabling policy and legislation shifts that must occur in order to enable the spatial concept. It is thus proposed that the initial, more immediate implementation phases focus on the enabling policy and legislation shifts, whilst the later phases focus on implementing the spatial concept once a solid policy foundation has been set. In addition to this, it is necessary to initially focus on reactively securing the 'core' PHA farmlands from further development encroachment through policy and legislation before moving to the more proactive spatial intervention. Tables 1-3 provide more information on individual projects. In this, more immediate catalytic actions are implemented first in order to lay the foundations for the realization of the vision for the PHA put forward, as well as for resolving existing tensions which create barriers against long-term, radical transformation.

Additionally, implementing the 'living urban edge' incrementally through phasing can enable the testing out of the concept in space, and can provide inspiration for further action. As discussed in Chapter 4 it is proposed in this dissertation that the 'living urban edge' is initially applied to the Schaapkraal urban edge since this is the area of greatest immediate threat (see Chapter 3). The lessons learnt from implementing the Schaapkraal 'living urban edge' can support the constant adjustment of the proposed spatial concept based on stakeholder feedback, which is essential given that this dissertation has advocated for a bottom-up defense of the urban edge throughout. Iterative and incremental implementation also facilitates the adaptive, dynamic and 'alive' approach to planning that this dissertation has put forward. The phased approach allows for the use of pilot projects in the site design phase (step 2 on Figure 82) so that when the process is monitored and evaluated, lessons learnt can be applied to the next phase of implementing the 'living urban edge.' As such, the implementation process indicated on Figure 82 will occur multiple times for each portion of the edge, with an extensive and ongoing public participation process. This also enables a nuanced and context-sensitive approach for different edge typologies as recommended in Chapter 4, Section 4.6. Figure 82 (overleaf) indicates this iterative approach to implementing the 'living urban edge'.

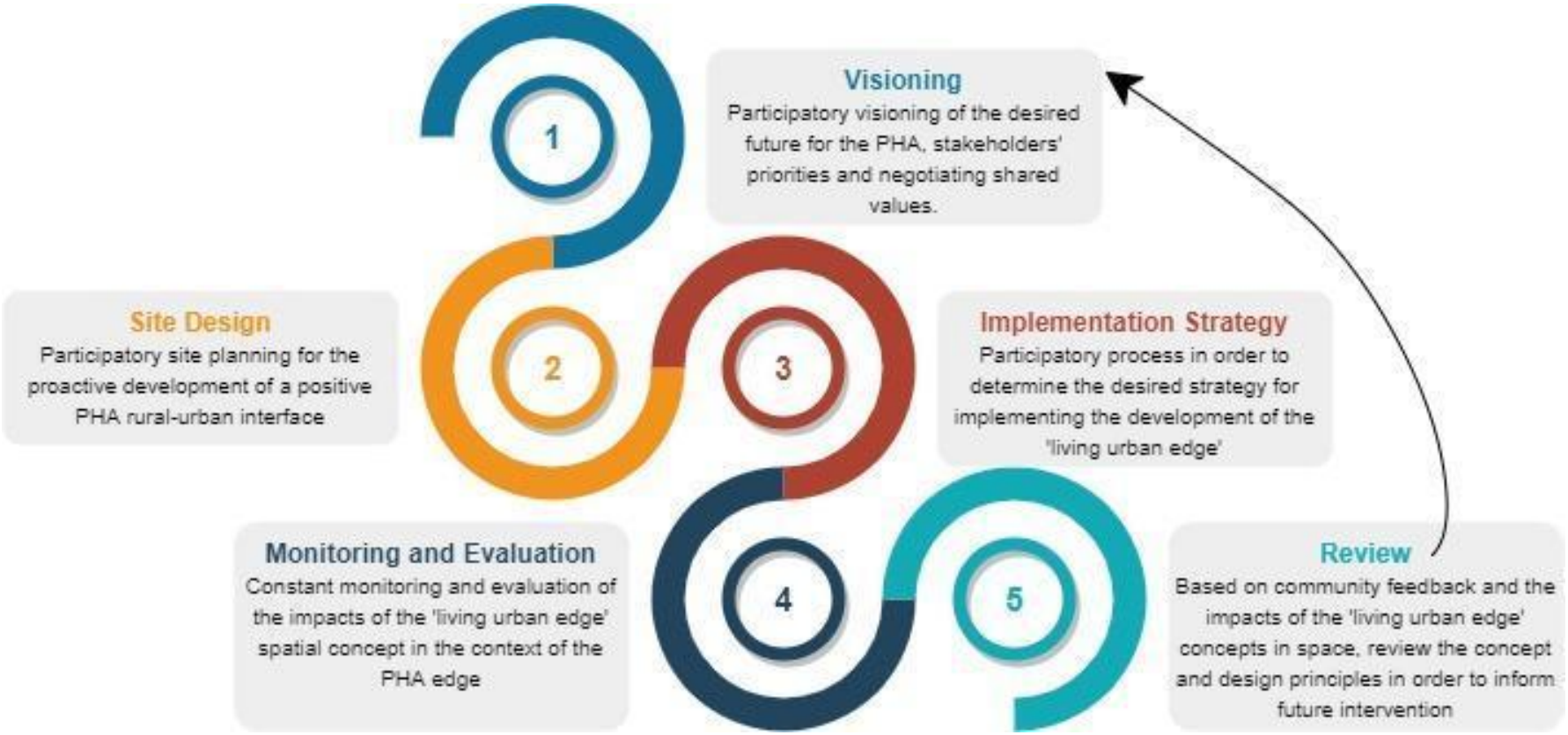

Figure 82: Iterative implementation process. Author's Own.

The following subsections broadly outline the various phases of the implementation process. Whilst all actions are aimed to be implemented through partnerships, different stakeholders are identified as responsible for spearheading and driving each phase. As previously discussed, it is envisioned that public participation processes will be undertaken throughout the implementation phases. After discussing each phase, Figure 84 will spatialise each phase in a diagram.

5.3.1. Phase 1: Enabling policy and legislative shifts, partnership building and securing the PHA 'core'.

As previously discussed, the most immediate actions that should be pursued in implementing the 'living urban edge' concept pertain to the enabling and policy legislation shifts put forward in Chapter 4, Section 4.5. Specific priority catalytic actions in this regard are put forward on Table 1 (overleaf). It is necessary at the outset of implementation to bolster the current protections on the 'core' PHA farmlands in order to prevent any more development encroachment in the immediate term.

In addition to this, conflict resolution, networking and the establishment of partnerships and collaborations need to be pursued before the 'living urban edge' implementation can proceed. It was argued in Focus Group 2 that the 'living urban edge' concept cannot begin to be realised without a common vision that stakeholders are collaborating towards. There is especially a need for establishing buy-in and ownership from the local community responsible for the bottom-up defence of the edge. Additionally, government champions, supporting NGOs and private sector partners need to be identified. It was argued by Spatial Planner 2 that it is necessary to make a strong economic argument[143] for the 'living urban edge' in order to establish buy-in from the state and private sector. In the case of cultivating community buy-in as previously mentioned the support of opinion leaders, faith groups and citizen groups needs to be garnered.

Since the majority of these projects put forward relate to policy and legislation, it is proposed that the state, specifically the proposed Municipal Directorate of Integrated Urban Food Systems Planning is responsible for driving these projects with partners playing a supporting role. As previously mentioned, this first phase will be undertaken in the short-term (0-5 years).

[143] The economic benefits of the project would need to be further investigated.

Table 1: Short-term Catalytic Projects (0-5 years)- Phase 1

Priority Action/Project	Funding Options	Supporting Policy/Legislation	Design Principle Supported[144]	Stakeholders
Establish the Municipal Directorate of Integrated Urban Food Systems Planning as the responsible actor for driving the policy changes below and enforcing protections on the PHA 'core'.	Municipal Spatial Planning and Environment Budget	CoCT Urban Agriculture Policy (2007)	All	CoCT Department of Urban Planning and Design Municipal Directorate of Integrated Urban Food Systems Planning
Amend the Draft CoCT Development Edges Policy (2009) and the CoCT zoning scheme Urban Edge Overlay (UEO) to include the design principles put forward in Chapter 4. Finalize[145] and implement the policy.	Municipal Spatial Planning and Environment Budget	Draft CoCT Development Edges Policy (2009) Western Cape Government Urban Edge Guidelines (2005) MPBL/zoning scheme	All design principles are supported, however, Principle 5 (Spatially Define the Edge) is especially supported by this action since implementing clear policy guidelines for the urban-rural interface will support better spatial definition of the edge.	CoCT Department of Urban Planning and Design.
Amend the Municipal Planning Bylaw (MPBL) Part 5 to include Local Area Overlay (LAO) zoning guidelines for the PHA based on the design principles put forward in Chapter 4 and the landscape character elements which make the PHA unique.	Municipal Spatial Planning and Environment Budget	MPBL/zoning scheme	All, but especially Principle 3 (Celebrate and Enhance the PHA)	CoCT Planning and Building Development Management Department Municipal Directorate of Integrated Urban Food Systems Planning. CoCT Development Management Department Community Groups
Investigate the declaration of the PHA 'core' farmlands as a Protected Area (PA) or a Protected Agricultural Area (PAA)	Municipal Spatial Planning and Environment Budget	National Environment Management Protected Areas Act (NEM:PAA) Preservation and Development of Agricultural Land Act Western Cape Provincial Spatial Development Framework (PSDF) CoCT MSDF CFDP	Principle 1 (Enable Defensible Space) Principle 3 (Celebrate and Enhance the PHA)	DALRRD

[144] Based on the design principles put forward in Chapter 4

[145] Currently, as discussed in Chapter 3, the CoCT Development Edges policy has never been formally implemented since the draft version was released in 2009. This seriously hinders the implementation of any form of spatial intervention at the urban-rural interface.

Priority Action/Project	Funding Options	Supporting Policy/Legislation	Design Principle Supported[146]	Stakeholders
Establish Sustainable Urban Drainage Systems (SUDS) and ecological buffers along the PHA edge, bordering 'agrisuperblocks' and in areas subject to flooding or of high aquifer potential	Municipal Capital Expenditure (Water and Waste) Budget	CoCT Climate Change Strategy (2021) Environmental Strategy for the CoCT (Policy Number 46612, 2017)	Principle 4 (Design Regeneratively) Principle 1 (Enable Defensible Space)	CoCT Department of Water and Sanitation CoCT Environmental Management Department. Environmental NGOs Community Groups
Amend the CFDP and CoCT MSDF to reflect the design principles and recommendations put forward in Chapter 4	Municipal Spatial Planning and Environment Budget	CoCT CFDP CoCT MSDF	All	CoCT Department of Urban Planning and Design. Community Groups
Establish an 'Aquifer Protection Overlay' zone with specific guidelines aimed at protecting areas of critical aquifer importance from damaging land use activities		CoCT MPBL Development Management Scheme (DMS) CoCT Climate Change Strategy (2021) Environmental Strategy for the CoCT (Policy Number 46612, 2017) Our Shared Water Future: Cape Town's Water Strategy	Principle 4 (Design Regeneratively)	CoCT Department of Urban Planning and Design. CoCT Environmental Management Department CoCT Development Management Department

[146] Based on the design principles put forward in Chapter 4

5.3.2: Phase 2: Securing Land and Funding

As previously mentioned, a process will need to be undertaken in order to acquire the privately owned plots on the edge in order to implement the proposed intervention. In addition to this, informal settlements on the edge will need to be addressed through either reblocking them in a way that is appropriate for the 'living urban edge' concept (as put forward in Chapter 4, Section 4.6) or by relocating to available land nearby. Of course, the issue of informal settlements on the edge is very contentious and needs to be undertaken with great care and subject to extensive further research. The PHA urban encroachment issue intersects strongly with Cape Town's housing crisis which needs to be addressed with imagination and urgency. This will be addressed in Chapter 6, Section 6.2. Projects and catalytic actions relating to Phase 2 will take place in the medium term and are summarized in Table 2 below. It is envisaged that the state will also drive this phase of the project with the assistance of civil society, NGOs and the private sector.

As previously mentioned, there are various government programmes in place which can be approached for funding, such as the Western Cape CASP programme or the CoCT Urban Agriculture Mayoral Renewal Programme. Additionally, the roll out National Land Reform and expropriation can also be used to acquire land for the purposes of the 'living urban edge'. These funding sources are indicated in Table 2. Additionally, international donor organizations such as the FAO, as previously discussed, can be approached for funding. Additionally, as discussed in Chapter 4, developers can be approached for land swaps in order to obtain land for implementing the 'living urban edge'.

5.3.3: Phase 3: Pilot Edge- Schaapkraal

As previously discussed, the Schaapkraal edge should be implemented initially as a pilot project in order to test the concept out in space, since this edge is facing the most pressing development pressures. After establishing a more positive urban-rural interface on the eastern edge through developing public spaces such as a farmers' market at 'gateways' along Strandfontein Road as discussed in Chapter 4, place-marketing[147] can be pursued in order to attract visitors to the PHA as an emerging destination place in the CoCT. This can bolster support for the 'living urban edge' project's future pases on other edges of the PHA. Projects and catalytic actions relating to Phase 3 will take place in the medium term (in conjunction with Phase 2 actions) and are summarized in Table 2 below. It is envisioned that this Phase will be driven by the PHA Campaign and community with the state, private sector and NGOs playing a supportive role.

147 As previously mentioned, place-marketing refers to establishing and publicizing a 'brand' or 'image' for a place.

Table 2: Medium-Term Catalytic Projects (6-10 years)- Phases 2 and 3

Priority Action/Project	Funding Options	Applicable Policy/Legislation	Design Principle Supported[148]	Stakeholders
Schaapkraal small-scale farming living urban edge pilot project: establish small-scale farms and ecological buffers on the western edge of the PHA.	National Treasury Agriculture, Land Reform and Rural Development Budget CoCT Urban Agriculture programme- Mayoral Urban Renewal Programme (R3 million released in 2021 for cultivating food gardens in the CoCT) Western Cape Department of Agriculture CASP NGO & international donor funding	Western Cape Government Provincial Policy for Small-Scale farming in the Urban Fringe (2009) CoCT Urban Agriculture Policy (2007)	All	DALRRD CoCT Department of Urban Planning and Design Municipal Directorate of Integrated Urban Food Systems Planning. Community Groups (PHA Campaign)
Develop public space such as fresh produce markets and informal trading spaces at gateway points on the 'living urban edge'	Public-Private Partnerships	CoCT Informal Trading Policy (2013) CoCT Urban Design Guidelines	Principle 3 (Celebrate and Enhance the PHA)	CoCT Recreation and Parks Department CoCT Urban Planning and Design Department Municipal Directorate of Integrated Urban Food Systems Planning. Private Sector Community Groups
Informal settlements on the edge- reblocking or relocation	NGOs CoCT Housing Budget Western Cape Government Housing Budget	Proactive Reblocking of Informal Settlements Policy (2013)		Western Cape DHS CoCT DHS Community Groups
Develop NMT routes linking the PHA to surrounding recreational space		CoCT NMT Policy and Strategy (2005)	Principle 3 (Celebrate and Enhance the PHA)	

[148] Based on the design principles put forward in Chapter 4

5.3.4: Phase 4: Northern, Eastern and Southern Edges

Based on ongoing Monitoring and Evaluation (M&E) of the pilot edges implemented in Phase 4, context-specific 'living urban edge' plans should be established and implemented for the northern, eastern and southern edges of the PHA. Subject to further research, these edges may require alternative 'living urban edge' typologies, as gestured at in Chapter 4. It is recommended that the Weltevreden Wedge edge is pursued first as it is already largely City-owned and earmarked for housing. Following this, the northern and southern edges can be investigated. Again, this Phase will be driven by the PHA Campaign and community with the state, private sector and NGOs playing a supportive role. These projects will take place in the long-term (11-20 years).

Table 3: Long-Term Catalytic Projects (11-20 years)- Phase 4

Priority Action/Project	Funding Options	Applicable Policy/Legislation	Design Principle Supported[149]	Stakeholders
Weltevreden Wedge sustainable medium density housing living urban edge pilot project	Department of Human Settlements Housing Budget NGO funding	CoCT Urban Agriculture Policy (2007) Revised CoCT Development Edges Policy (2009)- see table 1	All	Western Cape DHS CoCT DHS CoCT Urban Planning and Design Department Municipal Directorate of Integrated Urban Food Systems Planning. Community Groups PHA Campaign
Investigate northern and southern edge 'typologies'		Revised CoCT Development Edges Policy (2009)- see table 1	All	CoCT Urban Planning and Design Department Municipal Directorate of Integrated Urban Food Systems Planning. Community Groups PHA Campaign

[149] Based on the design principles put forward in Chapter 4

Figure 83 below spatialises the phases into diagrams. To recapitulate, Phase 1 involves immediately bolstering the legal protections on the PHA 'core' through an APOZ, an LAO and through declaring the farmlands as a PA or PAA. Additionally, a 'web' of blue-green infrastructure (green buffers and SUDS) are established to begin to restore ecological functioning. Phase 2 involves securing land on the edge for the establishment of small-scale farms united under a CLT. Phase 3 will roll out the Schaapkraal pilot project and connect the PHA to surrounding attractions, prioritizing NMT routes. Finally, Phase 4 will extend the 'living urban edge' to the remaining PHA edges.

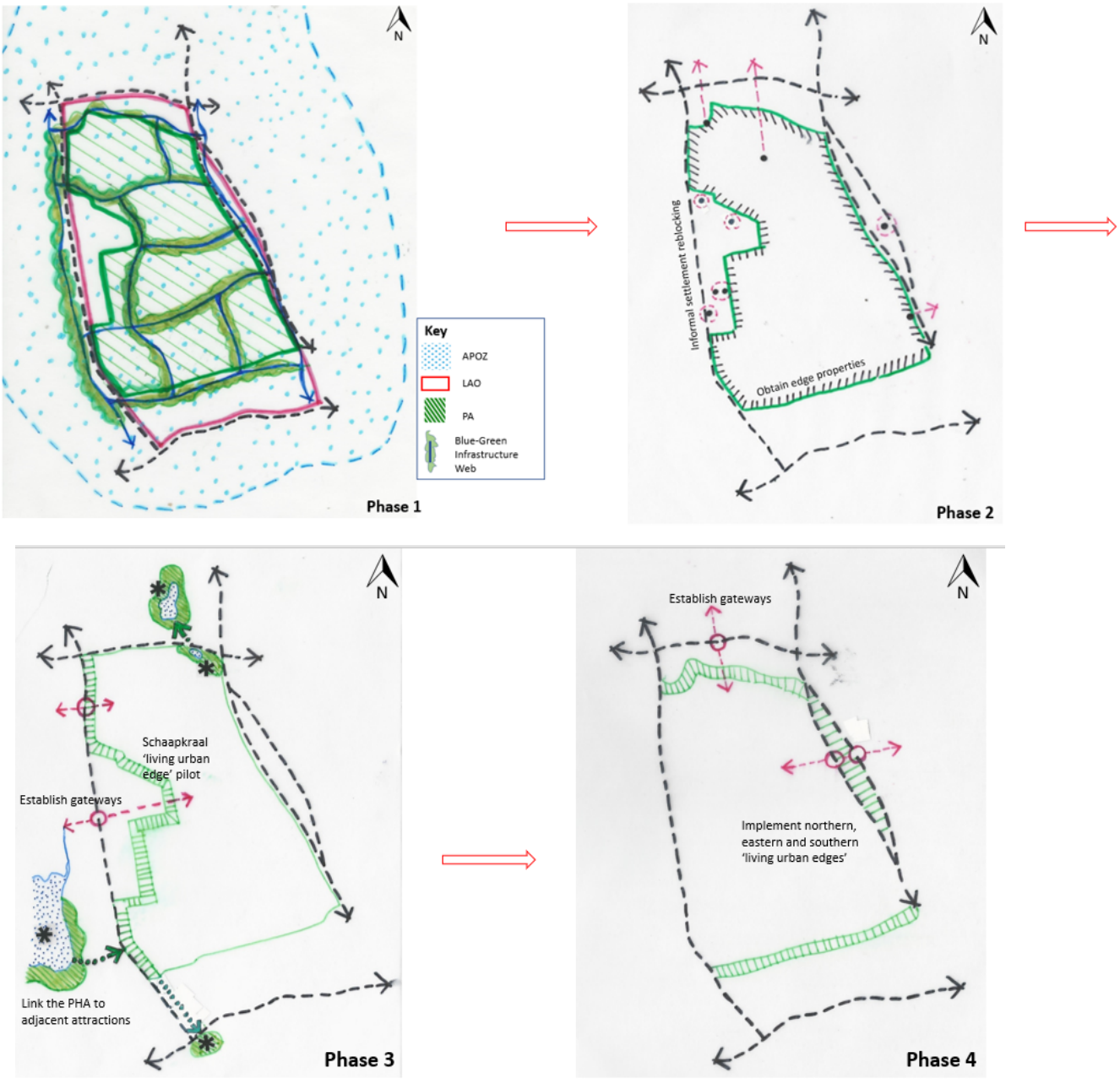

Figure 83: Phasing diagrams. Author's own.

5.4: Conclusion

This Chapter has outlined how the ‘living urban edge’ proposal might be implemented. The focus has been on pinpointing the implementation approach, which centers around cultivating partnerships and phasing the project so that implementation is incremental and adaptive. This approach aligns with the idea of creating ‘living structures’ put forward in Chapters 2 and 4. The use of partnerships improves the resilience of the implementation process, and works towards building and repairing relationships in the divided PHA space. It is important to acknowledge here that since tensions are currently high among stakeholders in the PHA, the building of trust will be a slow and ongoing process and full consensus may not be reached. In addition to this, the successful implementation of the ‘living urban edge’ is dependent on the proactive resolution of citywide systemic issues, most importantly Cape Town’s housing crisis. Difficulties also will likely also arise in making land swaps attractive to developers, or in encouraging collaboration with the PHA Campaign activists over antagonism. As such, the conflict resolution and relationship building processes in Phase 1 should not be taken lightly or undertaken as a ‘tick box’. Beyond this, if the ‘living urban edge’ is to be a truly bottom-up initiative, the ongoing public participation process throughout each phase needs to be prioritized. Finally, the implementation process is entirely dependent on the existence of political will and champions. This will be reiterated in Chapter 6.

Chapter 6: Concluding Remarks

6.1: Introduction

The following Chapter aims to provide a reflection on the findings and outcomes of this dissertation. This dissertation set out to explore how the urban-rural interface can be more proactively planned for given the threat of development encroachment on open space, through the theoretical lens of regenerative development and bottom-up planning. This encroachment occurs despite the efforts made within the planning discipline, through mechanisms such as the urban edge, to safeguard green space. This dissertation thus explored why these current tools are not effective with reference to the case of PHA in Cape Town, and how alternative and radical new approaches for safeguarding land from development encroachment can be imagined in order to improve these shortfalls.

This Chapter will begin with a personal reflection on the experience of undertaking this research journey in Section 6.2. Following this, the practical limitations facing this proposal which were identified throughout the research process will be outlined in Section 6.3. In response to this Section 6.4 identifies recommendations for further study in terms of how the findings of this research can be expanded. Finally, the main outcomes and findings of this research project will be discussed in Section 6.5.

6.2: Personal Reflection

This dissertation has been an exercise in exploring how planning can transform in more imaginative ways in response to the concurrent social, economic and ecological crises that the world's cities are facing. I have faced many doubts along the way as to whether the ideas that I have put forward in collaboration with the PHA Campaign are workable and realistic. However, I believe that if young planners are not idealistic and fail to challenge the status quo, our cities will never fundamentally transform in the way that is necessary given the existential threat of a changing climate, ecological destruction, resource scarcity and rampant socio-economic inequality. The capitalist paradigm of unfettered growth, expansion and consumption is not possible indefinitely. It is only through radical dreaming that we can create solutions that facilitate a more regenerative future for cities. This dissertation hopes to offer a glimpse into a more regenerative Cape Town where, through the design of an active and enlivened urban-rural interface, residents are better connected with the food they consume, food sovereignty can be reclaimed and the PHA farmlands are celebrated as a destination place within the Cape Flats. Through this, the conceptual separation between people and nature at the root of the modernist city can be reduced, and fragmented relationships as a result of apartheid planning can be restored. In addition to this through conceptualizing an urban edge that is defended from the bottom-up, the hope is that new planning approaches can be imagined where the immense energy and resources that exist among communities can be better mobilized and harnessed, and collaboration and synergies instead of antagonism and trade-offs are pursued.

6.3: Limitations

This Section aims to outline the limitations and challenges faced in undertaking this research journey. One of the core aims of this dissertation was to co-create planning solutions to the threats facing the PHA, in collaboration with the activists who are working on the ground to respond to these challenges. This approach was inspired by the PAR research method, where mutually-beneficial partnerships are created between researchers and communities, with both parties contributing to the outcomes equally. However, since this dissertation journey took place over less than five months, it was not possible to represent the PHA Campaign's ideas and interests equally and wholly. The power balance in the delivery of this project is also unequal, since I have produced the final product independently, with inputs from the PHA Campaign. Beyond this, the PHA community is diverse and multifaceted, and thus using the PHA Campaign to represent this community inevitably erases some perspectives. Again, the time constraints of this dissertation did not allow for engagement with other important stakeholders such as CoCT officials, informal settlement residents, aspirant small-scale farmers, edge residents and PHA commercial farmers.

Another core limitation, introduced in Chapter 5, is the fact that the successful realization of the 'living urban edge' concept is entirely dependent on the resolution of other intersecting systemic issues. For example, as previously discussed, one of the main sources of urban pressure on the PHA stems from a lack of affordable, well-located housing in the CoCT. As such, proactive and urgent efforts will need to be made to resolve Cape Town's housing crisis in tandem with pursuing the long-term protection of the farmlands. Additionally, the prevailing siloization within government structures needs to be broken down in order to respond to the intersecting issues facing the PHA. Furthermore, decision-making approaches need to undergo a fundamental paradigm shift beyond 'short-termism', as discussed in Chapters 2 and 3, if interventions such as the 'living urban edge' proposal are to be taken seriously in the political sphere. The realization of a 'living urban edge' is also dependent on strong government champions to drive the process, especially since it is envisioned that the proposal is implemented through government programmes such as land reform and affordable housing provision. However, given that delivery is already slow with both programmes, the likelihood of the government taking up the 'living urban edge' proposal is limited. However, as mentioned in Chapter 5, since the emergence of the COVID-19 pandemic, public sector decision-makers have become a lot more concerned with the importance of green space, food security and food sovereignty. As such, there is an opportunity in this crossroads moment that officials will be more receptive to proposals such as the 'living urban edge'.

6.4: Recommendations for Future Study

Based on the limitations previously discussed, and on issues which arose throughout the study requiring further investigation, the following areas are recommended for future study:

- Investigating how the PHA can be used as part of the national imperative for land reform, and how new approaches to land reform which target small-scale peri-urban farming can be cultivated
- Specific design guidelines for the northern PHA urban-rural interface typology, where agricultural land interfaces with industrial development
- Specific design guidelines for the southern PHA urban-rural interface typology, where agricultural land interfaces with ecologically sensitive land and residential development (Strandfontein Village)
- Specific design guidelines for the eastern PHA edge and investigating the viability of medium density, low-cost housing with community allotment gardens in the Weltevreden Wedge area
- Developing a long-term Spatial Development Framework for the entire PHA which takes the design principles put forward in this dissertation into account
- Investigating the appropriateness of the proposed R300 east-west movement extensions through the PHA and suggesting alternatives if necessary
- Investigating how informal settlements on the edge of the PHA can be appropriately and positively incorporated into the 'living urban edge' proposal
- Creating a strategy for obtaining the land on the edge of the PHA through mechanisms such as land swaps
- Investigate the projected economic benefits of the 'living urban edge' proposal to cultivate buy-in from the state and private sector
- Investigate a 'living urban edge' for the interface between urban and conservation land, and for the border of the entire Cape Town metropolitan urban edge.
- Engage with a wider group of stakeholders in order to broaden the community input beyond the PHA Campaign
- Investigate the applicability of the 'living urban edge' to other green spaces facing urban development encroachment, globally and locally.

6.5: Findings and Concluding Remarks

This dissertation began with an outline of the planning issue under investigation, namely the ineffectiveness of top-down and rigid development control tools such as the urban edge in preventing the encroachment of urban development on green space globally. It was found that this issue is especially pronounced at the urban-rural interface, which is a space with which the planning discipline has engaged minimally. As such, an opportunity was identified to explore novel and innovative ways for discouraging development encroachment through the PHA case study, where this planning issue manifests strongly and in complex ways.

In Chapters 1 and 2, the theoretical underpinning of the 'living urban edge' concept was introduced. Namely, the ideas of regenerative and bottom-up development were explored as a response to the shortfalls of the sustainable development paradigm and of top-down planning approaches, both of which inform the urban edge planning tool. In Chapter 2, the current approach to safeguarding open space from development encroachment through top-down and rigid planning tools, with a focus on the urban edge, was investigated and problematized.

Attention was paid to the conceptual roots of this approach in the modernist paradigm and sustainable development narratives. It was found that globally, this tool is failing to prevent urban development pressures from whittling away the green space which is essential for securing regenerative futures. Furthermore, the reasons behind this failure were explored. It was found that the reactive and passive approach of merely separating the urban and the rural with a cadastral 'line' is insufficient for contending with the immense complexity of the urban-rural interface. Due to a lack of positive and proactive planning guidelines for the interface, this space becomes riddled with ambiguity, confusion, tension and contradictions, which enables urban encroachments on agricultural space to go unnoticed and unchecked. Conceptually, it was argued that the urban edge tool is flawed as it perpetuates the separation between people and nature which is at the root of the current unsustainability of cities. This misses an opportunity to cultivate stronger relationships between city dwellers and the food they consume, and with nature. A further core issue with the urban edge (and other development control tools) is that they are implemented from the top-down. This concentration of planning power under a single authority often leads to political meddling with these protections to enable lucrative property development. Decisions made by political custodians of green space often prioritize short-term economic outcomes, which leads to the undercutting of environmental protections when trade-offs are made. Additionally, often planning regulations are inadequately enforced from the top-down. Chapter 2 concluded with the indication that the bottom-up protection of land, where communities are the custodians of green space, may offer a way forward in responding to these challenges.

In Chapter 3, the PHA case study was introduced. It was found that the PHA is a microcosm of the issues with the urban edge tool outlined in Chapter 2. However, the fact that a passionate community of activists and small-scale farmers are galvanizing behind the need to protect the PHA offers an opportunity for responding to the threats of development encroachment facing the farmlands in a holistic and regenerative way. Chapter 4 responded to this opportunity by putting forward the 'living urban edge' spatial concept in collaboration with the PHA Campaign activists. The spatial concept explored design principles for creating a regenerative urban-rural interface in response to the challenges identified in Chapter 3. It was explored how these proactive design principles can enhance the long-term protection of the PHA whilst simultaneously benefiting local communities through pursuing small-scale regenerative agriculture as a buffer around the edge of the PHA. The hope is that this buffer of farms, united under a Community Land Trust, can ensure that the edge is secured and defended from the bottom-up, and that a positive and active urban-rural interface is created. Through this active and 'alive' interface, where communities are embedded in relationship with the farmlands, the PHA can be celebrated as a destination place in the CoCT which can hopefully inspire greater support for its protection. It was proposed in Chapter 4 that various policy and legislation changes need to be enacted to ensure that the 'living urban edge' design principles are upheld.

Finally, Chapter 5 put forward an implementation framework for the proposal outlined in Chapter 4. It was argued that cultivating partnerships is essential for successful implementation. Whilst the aim is for the development of the 'living urban edge' to be community-led, the state, NGOs and the private sector play essential supporting roles. In addition to this, it was proposed that

the project is phased and implemented incrementally to allow for an adaptive approach where lessons learnt can be applied to the next phase. As a bottom-up initiative, public participation throughout the phases is essential.

The hope is that the ‘living urban edge’ concept can inspire innovative new approaches to preventing development encroachment on green space elsewhere. Instead of separating green space from urban space with rigid yet visually indistinct cadastral ‘lines’, the ‘living urban edge’ envisions the reconciliation of tension between people and the environment by imagining how people themselves can create a line of defence against urban externalities. This is essential given the constant erosion of the world’s green space due to rapid urbanization. If city planners are to secure regenerative and thriving urban futures, radical and innovative ideas which reimagine the status quo are of critical importance.

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Appendix A

Approved Ethics Application

Application for Approval of Ethics in Research (EiR) Projects
Faculty of Engineering and the Built Environment, University of Cape Town

ETHICS APPLICATION FORM

Please Note:
Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: http://www.ebe.uct.ac.za/ebe/research/ethics1

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant		Tessa Chittenden
Department		Architecture, Planning and Geomatics
Preferred email address of applicant:		tessachittenden@gmail.com
If Student	Your Degree: e.g., MSc, PhD, etc.	MCRP
	Credit Value of Research: e.g., 60/120/180/360 etc.	120
	Name of Supervisor (if supervised):	Tania Katzschner
If this is a researchcontract, indicate the source of funding/sponsorship		National Research Foundation (NRF)
Project Title		The living urban edge: a community-driven spatial framework for the long-term safeguarding of the Philippi Horticultural Area (PHA)

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

APPLICATION BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Tessa Chittenden	T Chittenden	2021/06/08
SUPPORTED BY	Full name	Signature	Date
Supervisor (where applicable)	TANIA KATZSCHNER		29.06.2021

APPROVED BY	Full name	Signature	Date
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section 1; and for all Undergraduate research (Including Honours).			
Chair: Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the questions in Section 1.	Prof. H. von Blottnitz	H. von Blottnitz	3 August 2021

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Appendix B

Copy of consent form given to research participants

SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS
University of Cape Town
Private Bag x3, Rondebosch 7701
Centlivres Building
Email: Janine.Meyer@uct.ac.za Tel: 27 21 6502359

UNIVERSITY OF CAPE TOWN

August 2021

STATEMENT TO BE READ OUT TO AN INTERVIEWEE BY A STUDENT ABOUT TO UNDERTAKE AN INTERVIEW FOR THE PURPOSES OF A MASTERS DISSERTATION

MY NAME IS TESSA CHITTENDEN AND I AM STUDYING CITY AND REGIONAL PLANNING AT THE UNIVERSITY OF CAPE TOWN.

I AM DOING RESEARCH THAT INVESTIGATES A NOVEL SPATIAL CONCEPTUAL FRAMEWORK FOR SAFEGUARDING THE PHILIPPI HORTICULTURAL AREA (PHA) FROM URBAN DEVELOPMENT ENCROACHMENT.

AS PART OF MY MASTERS DISSERTATION AND I WOULD LIKE TO ASK YOU SOME QUESTIONS TO HELP ME WITH MY RESEARCH.

I CAN PROMISE THAT I WILL NOT RECORD YOUR NAME OR ADDRESS, AND YOUR PERSONAL DETAILS WILL NOT IN ANY WAY BE REVEALED IN MY DISSERTATION OR ANY PUBLICATION I PRODUCE.

THE QUESTIONS I ASK ARE ONLY FOR RESEARCH AND THEY CANNOT DIRECTLY BENEFIT YOU OR YOUR COMMUNITY.

IF YOU WANT TO END THE INTERVIEW AT ANY POINT YOU ARE FREE TO DO SO.

MY SUPERVISOR IS Tania Katzschner AND HER CONTACT DETAILS ARE: Tania.katzschner@uct.ac.za
or 021 6502381 (cell 0836347887)

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Signature and designation (interviewee) Signature of student