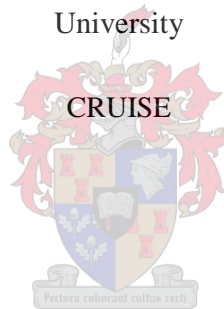


**THE URBAN ANTROPOCENE:
THE CASE OF URBAN ENCROACHMENT UPON THE PHILIPPI HORTICULTURAL AREA,
CAPE TOWN**

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Mini-thesis presented in partial fulfilment of the requirements for the degree Master in
Urban and Regional Planning in the Faculty of Arts and Social Sciences at Stellenbosch

University



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March 2016

DECLARATION

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ABSTRACT

The world today faces unprecedented challenges and possible outcomes as it is moving into the new geological epoch of the Anthropocene. Marking a new chapter in the history of earth, global changes are generally considered to be a consequence of human activities. Rising from 30% in 1950 to 54% in 2014, urbanisation and the Anthropocene are seen to be synonymous terms (Reid 2014). Reid also mentions the Anthropocene to be a cause of unregulated and unplanned urban growth, not taking into account long term sustainability. This statement can be supported by authors such as Swilling et al. (2016), Campbell (1996) and Sinclair et al. (2010). Following this notion, this article will look at planning structures for the City of Cape Town in South Africa and more specifically the case of the Philippi Horticultural area. This area, known to be of high value to the City in terms of food production and water provision, currently faces continuous requests to amend the urban edge and to use land for multiple uses, mainly consisting of formal urban encroachments. The main argument will show how the jurisdiction within the country regulates these encroachments and how different inter-governmental demands/goals result in jurisdictional fragmentation and in essence an uncertainty about the sustainability for the entire City.

Keywords and phrases: Urban Anthropocene, Urban Agriculture, Jurisdictional Fragmentation & Sustainable urban growth

OPSOMMING

Die wêreld vandag staan menigvuldige en gekompliseerde uitdagings aan, soos dit in 'n nuwe geologiese epog ingaan, die epog van die Anthropocene. Hierdie nuwe hoofstuk in die geskiedenis van die aarde se bestaan word aangeteken as 'n negatiewe nagevolg as gevolg van menslike druk en aktiwiteite. Verstedeliking het gestyg van 30% in 1950 na 54% in 2014, 'n belangrike globale statistiek om aan te dui dat die Anthropocene en verstedelike twee eenderse terme is (Reid 2014). Reid het ook bygevoeg dat die Anthropocene 'n direkte nagevolg is van ongereguleerde en onbeplande stedelike groei en 'n tekortkoming aan langtermyn en volhoubare denkpatriene. Hierdie stelling word ook ondersteun deur onder andere Swillin et al. (2016), Campbell (1996) en Sinclair et al. (2010). Hierdie artikel sal dus kyk na stedelike beplanning strukture vir die Stad Kaapstad, Suid Afrika en meer spesifiek na die gevallestudie van die Philippi Hortikultuur area. Hierdie area (voortaan bekend as die PHA) is bekend vir hoë voedselproduksie syfers sowel as water voorsiening en staan tans konstant in gevaar van 'n aanvraag en indringing van veelvoudige land gebruike asook formele stedelike indringing. Hierdie artikel sal dan ook kyk na die invloed van jurisduksionele fragmentasie en die invloed daarvan op uiteindelijke langetermyn stedelike volhoubaarheid. Dit sal hier argumenteer word dat verskillende departemente en individue, verskeie doelwitte en fokuspunte het, wat lei tot onsekerhede in stedelike beplanning vir 'n spoedige groeiende stad.

Trefwoorde en frases: Stedelike Anthropocene, Stedelike Landbou, Jurisdiksie Fragmentasie & Volhoubare Stedelike groei

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1. INTRODUCTION

Humanity is known to have entered the Anthropocene, a new geological epoch where human activities are seen to have the biggest impact on earth's atmosphere, oceans and wildlife (Vaughan 2016). The Anthropocene is largely impacted by the increasingly expanding and developing cities into megacities (Allen, Lampis & Swilling 2016; Rockström, Steffen Noone, Persson, Stuart III Chapin et al. 2009). Unregulated and unplanned city development can harm the surrounding environments (agricultural, natural and vegetation). It is becoming increasingly important to focus on the balance between expanding urban growth, placing pressure on the expansion of the urban edge, and the conservation of natural habitat. As 54% of the global population currently lives within cities and is expected to rise to around 66% in 2050, it is relevant to note the impact of human activities in the sustainability of cities (Reid 2014).

Such potentially unregulated development is occurring in the Philippi Horticultural area (PHA), situated south-east of the Cape Town city centre, within the Cape Flats region, adjacent to the densely populated poor communities of Mitchells Plain, Ottery and Grassy Park (Figure 1). The PHA will be the case-study area for this paper.

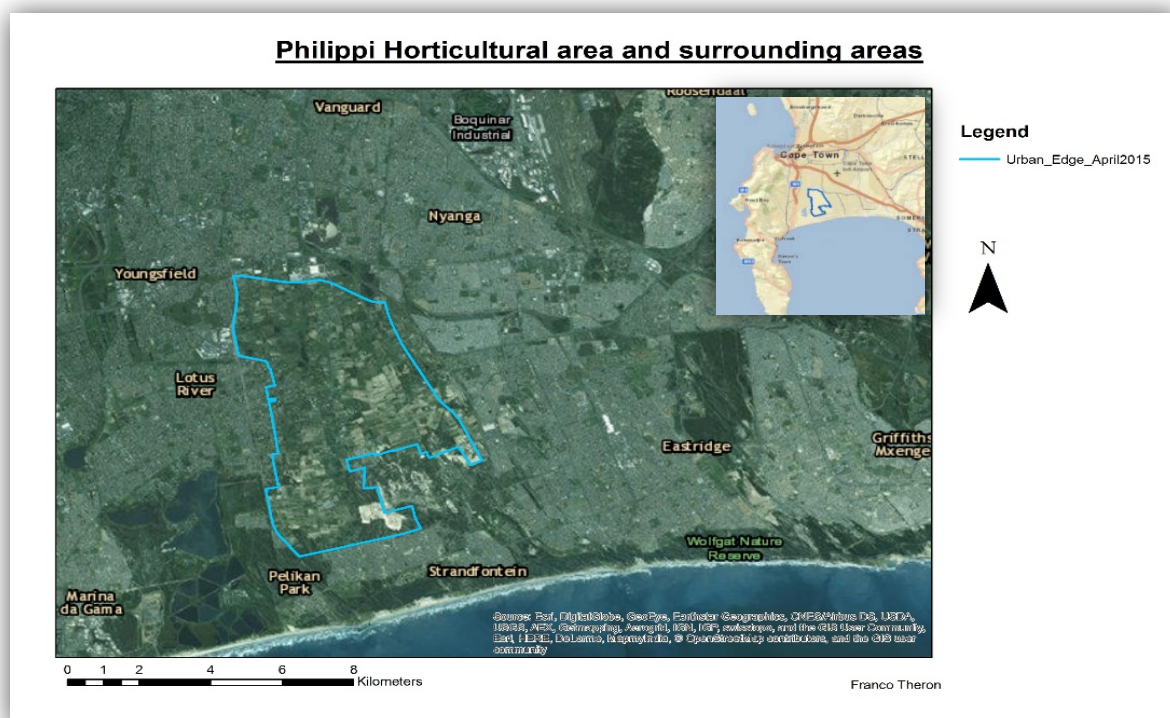


Figure 1 Locality map of study area

Due to the region's close proximity to the city centre, it is ideal for urban edge relaxation and urban development. Agricultural land within the Southern and South-Eastern parts of Philippi is currently

under threat as the relaxation of the urban edge will result in a proposed rezoning of agricultural land and the establishment of a township and commercial use. Although the land does not consist of ideal agricultural soil, the PHA provides Cape Town with vegetables and serves as a green lung for the city for more than two centuries. Although Local and Provincial Government realised the potential of the PHA as a valuable source of agriculture and biodiversity prominence, this part of the City is constantly in demand for rezoning for residential and commercial development (Battersby, Lennard & Haysom 2012). Although the PHA is currently zoned agricultural, other activities and uses are found within the area such as automobile services, waste- and landfill sites as well as informal settlements, makes the application of rezoning and township establishment a logical and even necessary step in the near future.

Even though urban agriculture is a strategic developmental priority in Cape Town, the implementation thereof may not be efficient as its utility is often outweighed by alternative urban land uses (Future Cape Town 2013). As urbanisation and traffic congestion lead to a higher demand for the expansion of cities/ the urban edge, the higher opportunity costs of alternative essential land uses within the city results in the competition between housing, industry and urban agriculture. The result of this conflict reduces the economic and political viability of urban agriculture (De Bon et al. 2010).

As development ideologies are moving towards sustainability, more political tensions may arise while pursuing different sustainability components such as economic growth, environmental conservation and a high quality of life (McDaniel & Alley 2005). The challenge is to harmoniously achieve all of the sustainability segments simultaneously, as a constant discrepancy seems to prevail among public officials and Departments concerning the future outcome of the PHA. The PHA is located within different spheres of government, subject to provincial and local authority bodies, namely the Western Cape Provincial Government and the City of Cape Town (CoCT) Metropolitan Municipality. This complicates governmental tasks and decision making in formulating and implementing coherent urban planning. Decisions made by different institutions are often contradictory and self-defeating; leading to uncertainty regarding the future of the PHA and the development trajectory it is taking, impacting on productivity and the willingness of farmers to continue farming in this area (De Zeeuw, Van Veenhuizen & Dubbeling 2011, Sondag 2015).

There are multiple contradicting opinions concerning the sustainability of farming within the PHA. Battersby-Lennard & Haysom (2012) argue that the total agricultural land's productivity level within the PHA is relatively low, thus not ideal to be utilised for agricultural purposes. However, others state that production outputs in the PHA are relatively high due to intensive farming and a high level of production inputs, even though agricultural units are smaller in size due to urban encroachment

(Sonday 2015). Figure 2 gives an indication as to which problems will be looked at throughout this article.

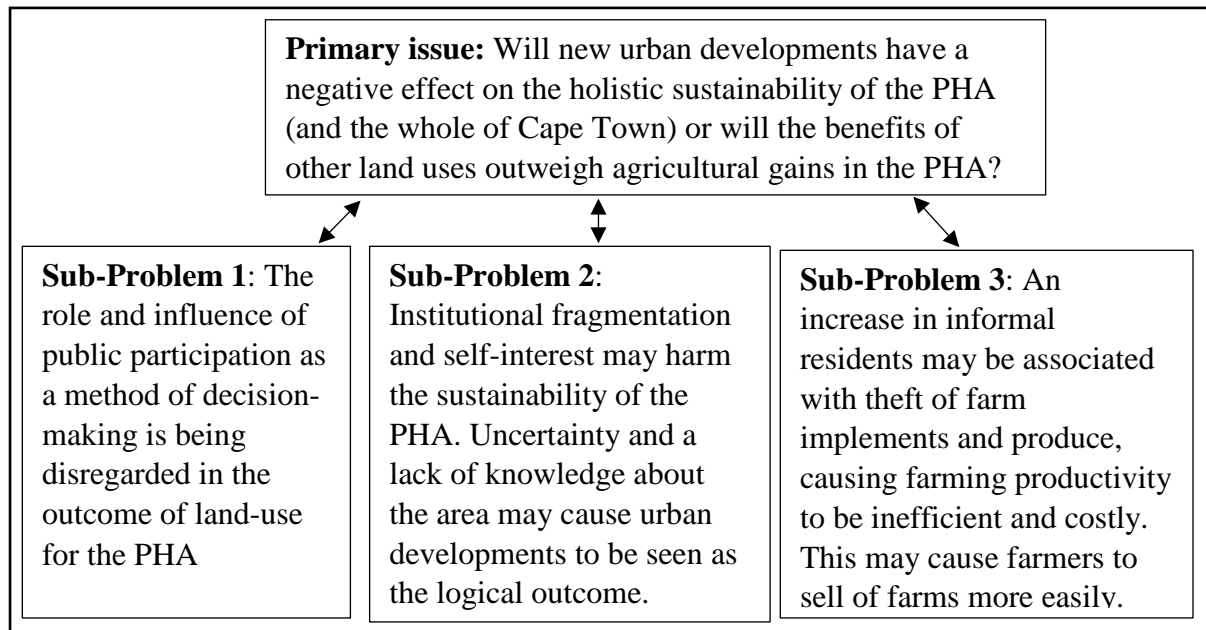


Figure 2 Problems and sub-problems for this article

Besides the primary problem, the institutional fragmentation, a second problem is the lack of consistent public participation in influencing decision making. This includes not only the general public, but more importantly the voice of farmers. This article will indicate the level of public involvement and whether their voices are heard and incorporated in the decision making process, adhering to democratic principles. Thirdly, although a multitude of factors, such as urban encroachments, illegal dumping and residency and theft are currently impacting the sustainability of the PHA as a viable food production source for Cape Town, the biggest concern seems to be that of political discrepancy over the use of this area.

The main issue this paper will attempt to address is as follows: Is the PHA more suitable for agricultural use or will rezoning to township development be more suitable for the sustainability (in terms of Economic, Social and Environmental factors) of Cape Town?

The sub questions relating to this will be stated as:

- Does institutional fragmentation lead to inefficient urban planning, thereby resulting in potentially unsustainable growth and development?
- What is the role and influence of public participation regarding the PHA?
- Does the unregulated increase of informal settlements within the PHA increase pressure on farmers to sell off their farms?

This paper hypothesises that agricultural land use should prevail above planned urban land use in the PHA as this will have a positive outcome on the sustainability (Economic, Social and Environmental) of the City of Cape Town. Supporting this hypothesis, the following sub-hypotheses will also be used.

- Institutional fragmentation and self-interest results in inefficient decision making for the PHA, ultimately results in the loss of agricultural land and green spaces.
- A lack of public participation leads to politically-motivated decision making based on self-interest and rent-seeking motives
- Ineffective planning leads to the establishment of informal settlements in the PHA, negatively impacting on the primary and possibly the most economically viable land use of farming and the sustainability thereof.

All of the above research questions will directly ask whether the sustainability of Cape Town and the PHA is effectively planned and implemented. With this, social sustainability and equity (in terms of informal settlement relocation) should also suffice as a democratic principle of public voice and participation. The primary aim of this study will be to analyse the land use in the PHA, most suitable for sustainability in Cape Town. The further aim will then be to indicate the positive and negative impacts of all current and planned land uses. This article therefore aims to evaluate the discrepancy between long term development goals, set out by policies, and the short term political incentives of public officials. To achieve this, the paper will evaluate whether decision making is one of holistic and democratic principles, or rather one based on special interest. A further aim will be to see whether public participation in decision-making is made correctly.

The study aims to make a contribution to the urban and regional planning field with regard to sustainable and integrated urban planning within the City of Cape Town, South Africa. This study will analyse relevant literature with regard to the nature of sprawling city structures within South Africa and whether unplanned and unregulated planning still can be seen as a major issue within South Africa.

1.1 Research Methodology

The research made use of a qualitative approach. This method of research is accepted as a method of research within social sciences (Hancock, Ockleford & Windridge 2007). Qualitative research attempts to help the researcher gain understanding as to why things develop as they do. It therefore involves the primary exploration of human behaviour and how different individuals or groups experience certain situations. This will then be of utmost relevance for this article as one of the aims will be to analyse a case study through the different perceptions of individuals within different situations.

Primary data comprising of semi-structured interviews with farmers, developers, informal dwellers and public officials was used. Secondary data was also used, which included relevant literature and theories. The purpose of this literature search is to discuss the principles of urban sustainability as well as collecting data from institutional documents regarding the PHA (Spatial Development Frameworks (SDFs), Integrated Development Policies (IDPs), discussions, letters, news articles and academic articles concerning this case study).

The secondary data is invaluable and contributes significantly to the study as it creates a background and path for analysis (Hindes 1997). Findings derived from primary data sources (interviews) can be compared to existing literature and other case studies, as well as contextualising the study area within the international context (Long-Sutcliffe et al. 2010).

1.2 Data collection and sampling

Qualitative measures were taken in the form of semi-structured interviews to assess perceptions of stakeholders, namely farmers, developers, informal residents and state officials regarding which land use will be most sustainable for the City of Cape Town. Purposive sampling has been used in the form of stakeholder sampling. Palys (2008) defines this as mostly relevant for evaluation research and policy analysis. Purposive sampling will identify key stakeholders to analyse the case thoroughly. This form of research also evaluates who are affected by certain implementations and how. Semi-structured interviews have pre-determined questions to facilitate open discussion and covering certain themes during each interview (Newton 2010).

Individuals were interviewed according to categories such as emerging piggery farmers, commercial vegetable farmers, informal residents, informal employees and township establishment developers. Face-to-face interviews enhance insight, understanding and further discussion concerning matters (Gillham 2000 cited in Newton 2010).

This research also followed a case study approach as a qualitative method in order to examine a real life situation and to provide a basis of ideas. Yin (1984) also defines this method as an empirical enquiry that investigates a theoretical issue within the real-life context. The study will use the case of the PHA to test whether an institutional inefficiency and fragmentation may impact urban development.

1.3 Data analysis

After collection of all primary (interviews) and secondary (literature) data, findings will be analysed. Analyses will commence after interviews are transcribed and categorised in specific themes that can

be compared to existing literature and theories. Findings will be synthesised with existing literature after which comparisons can be made.

This primary analysis will help to contrast different land uses against one another. All land uses will be compared in terms of a SWOT (Strengths, Weakness, Opportunities and Threats). This will be done to answer the primary question of whether agriculture/horticulture should remain as the prominent land use for the PHA. Sensible conclusions and interpretations of findings can then be used to test the hypotheses.

2. LITERATURE REVIEW

The Anthropocene marks that human activities dominate geomorphological processes since the 1750's. As urban populations expand, rapid and unplanned urban development seems to occur globally (Reid 2014). The world currently faces several problems such as climate change, inequality, food insecurity, water scarcity, financial and social discontent, issues that contribute to or are the result of rapid urbanisation (Allen et al. 2016). If this trend of unplanned and low-density sprawl is to continue, urban populations will grow to dominate the global material flows, which in effect will leave a large and destructive footprint on urban biodiversity (Sinclair et al. 2010).

Ironically, as governments nationally are trying to follow a denser city structure, cities are becoming increasingly sprawled. This inevitably increases the human pressure on ecological boundaries (Allen, Lampis & Swilling 2016). This is motivated by what is called the capitalist urbanisation, a principle where cities are the central locus for economic prosperity and conflict (Harvey 2012).

Larsen (2014) notes that the South African context can be a direct consequence of modernist planning during the Apartheid regime, where ideas were pursued from the United States and other Western European countries, such as the following (Dewar, Louw and Povall 2012):

- The idea to separate different land uses and reduce functional conflict.
- A strong “anti-urban” movement, which motivated urban sprawl and a strong belief in single free-standing neighbourhood dwelling units.
- And a false belief that “technology would set society free”, meaning that the motor car has been seen as the most important technological improvement, thereby encouraging unregulated urban sprawl.

This modernist planning, according to Dewar, Louw and Povall (2012) proved crucial, as initial green buffers (such as the PHA) tended to become dangerous spaces and an unregulated land use for landfills and dumping grounds for rubbish.

The Anthropocene poses a dilemma as sustainable urban development now seeks ways in which cities can integrate with other sectors. Cities and governing bodies are now facing the task to weigh environmental, social and economic goals against one another. The difficulty in this is to find a balance between all three spheres of Government (Allen et al. 2016).

Smart growth can be a solution to counter sprawl as it advocates that an increase in suburban lifestyle and creation will inevitably harm future generations (Katz 1994; Allen, Lampis & Swilling 2016; Harvey 2012; Sinclair et al. 2010). Sustainable urban growth often faces competing goals. Within South Africa, and specifically the Western-Cape, this may create confusion and jurisdictional

separation as the most dominant aims are food security, employment and housing (Western Cape Government 2014). Klein (2014) supports smart growth theory, focusing on smallholder/emerging farmers in order to combat the negative impacts of urban growth as well as to help generate more employment opportunities within the country.

Sinclair et al. (2010) refers to two primary challenges within this age. These are the aim to understand and combat the accumulating environmental burdens that cities place on its surrounding environments, and secondly the learning and adaptation in order to help local governments to build urban resilience. These challenges, directly relate to aspiring and rapid growing economic cities, especially within the developing world. Cape Town can certainly be indicated as such a prosperous city and can therefore adapt to support sustainable urban growth. Although supported through development goals and policies, this should be supported during the implementation thereof by local government (Future Cape Town 2013).

2.1 The other side of the coin

Gordon and Richardson (1999) contradict this statement made by authors such as Sinclair et al. (2010). Food production per capita has risen for half a century since WWII, even though more agricultural land has been consumed by urban development due to strong population growth trends. With this, they expect that population growth will peak by 2030, after which it will start to decline, based on the UN “low variant” projection (Eberstadt 1997).

A second point, made by Gordon and Richardson (1999) is that urban environmentalists use urban pollution as a means to preserve farmland. The reality, however is that agriculture is one of the biggest polluters worldwide due to its responsibility for 70% of waterway pollution. This is a result from fertilisers, animal waste and erosion.

The next section will then analyse this adaptation and whether the City of Cape Town and Western Cape Provincial government works together holistically to make the city economically viable as well as sustainable. This will be done through analysing decision making over the area of the Philippi Horticultural area.

2.2 The Philippi Horticultural Area

The PHA, situated nearly 30km south-east of Cape Town, has been serving as an agricultural area since 1883. The then Minister, John Merriman, attracted German farmers (from the Lüneburger Heide district) to the area to produce fresh food for the cities of Cape Town, Stellenbosch and Strand (Rabe 1983). The farmers arrived in two groups between 1877 and 1883, establishing the Kaapse Vlakte- en

Distrik Boerevereniging. This is regarded as the oldest farmers union in SA (Battersby-Lennard & Haysom 2012).

Farming initially proved difficult as the climate; soil and insect plagues had negative impacts on crops German settlers, flourished with “stone desert” farming methods, stabilising loose windswept sandy soils, through the plantation of trees and changing the natural dune area into agriculturally productive land (Rabe 1983). During this time period, the PHA consisted of nearly 13 square kilometres, a figure four times larger than the current extent of the PHA (Rabe 1983). Only 10% of the original farming area is still cultivated. During 1967 the PHA was reduced for township establishment within the Northern- and Eastern sections of the PHA. Low cost housing was developed in townships including Langa, Nyanga, Grassy Park, Mitchells Plain and Gugulethu (Battersby-Lennard and Haysom 2012) (Figure 3).

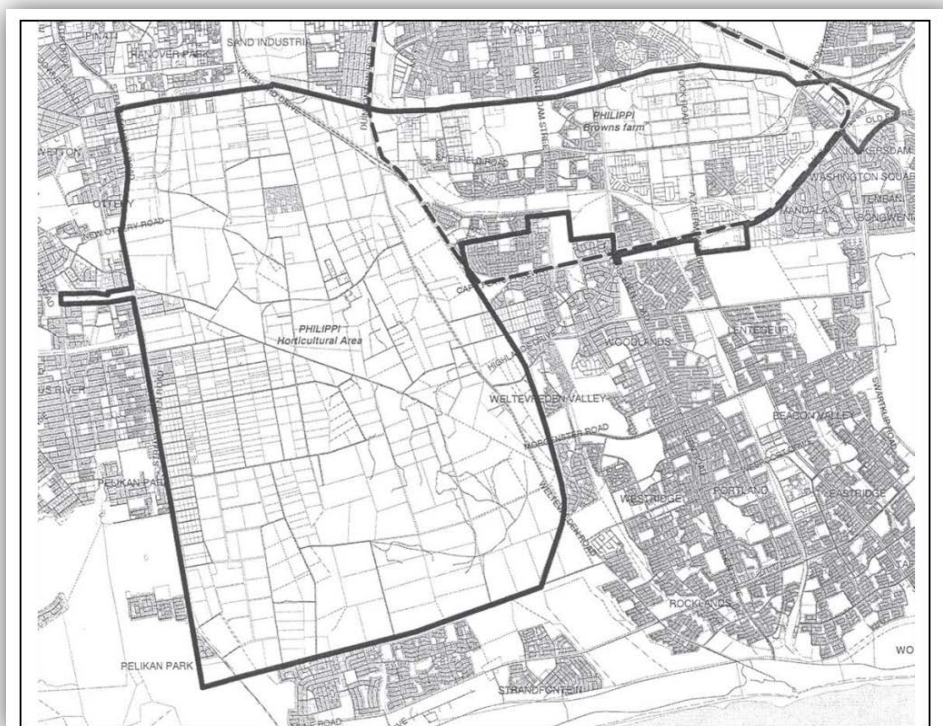


Figure 3 PHA 1967

Rabe (1983)

The remaining section of the PHA was protected by the Physical Planning Act, Act 88 of 1967 (see Figure 4) and was mainly used for grazing until the 1970's, although various crops were also cultivated during this period (Battersby-Lennard & Haysom 2012). Between the 1970's and the 1980's informal settlements arose in the Crossroads area in the northern section of the PHA. Between 1951 and 1980 the population in the rezoned sections of the PHA and Crossroads increased from approximately 16,500 to 140,500 people (Anderson, Azari & van Wyk 2009).

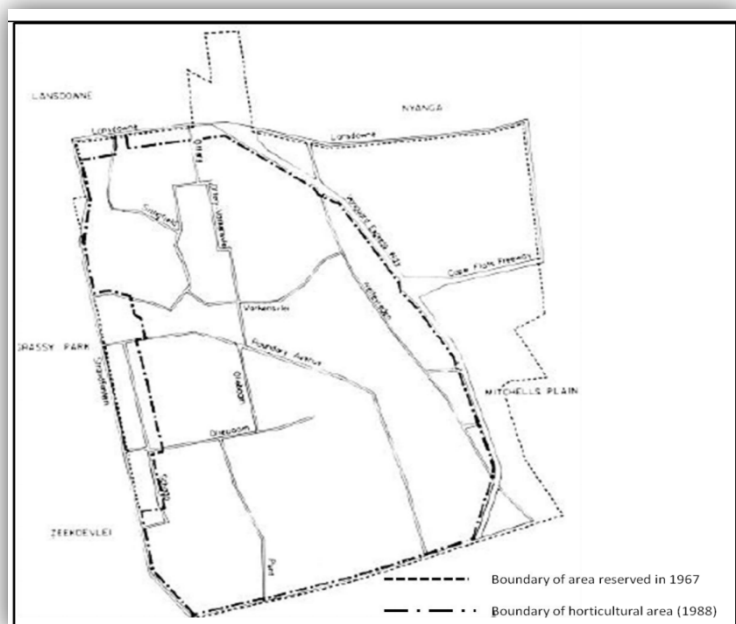


Figure 4 The 1967 (Guide Plan) and 1988 (LUPO) changes to the PHA Rabe (1983)

By 1990 there were 41 commercial farms in the remaining section of the PHA of which 17 were piggeries, diaries and chicken farms. The area produced 54 different types of vegetables with population growth increasing demand for food produced in the PHA for the surrounding areas (Rabe 1983). Currently, the PHA is an agricultural area outside the urban edge. The extent of the area is approximately 3232 hectares, of which 50% of the area is currently cultivated. In addition, horse paddocks, pig and poultry farming, scrap yards and silica dune mining occurs in the PHA. It produces approximately 84000 tons or 20% of Cape Town's vegetables and employs an estimated 2000 individuals (de Satgé et al 2008).

Situated between the major transport routes of the R300, N2 and Lansdowne road and close to central Cape Town, the area is surrounded by some of the poorest communities in Cape Town including Guguletu, Mitchells Plain, Ottery and Grassy Park. The Cape Flats Aquifer is situated inside the PHA. This aquifer is seen as the aquifer, within the Cape Town Metropolitan, having the highest groundwater potential, but remains as the most under-utilised water resource within the region. It also has a transmissivity value of 50-650m²/day (Usher & Xu 2006).

Although the area is located outside the urban edge, there are currently two major urban edge relaxations planned for the Southern section of the PHA. These are the RapiCorp/Oakland city (472 ha) (Blue) and MSP (272ha)/Uvest (96ha within MSP boundary) (Red), developments. The RapiCorp development sent an application in 2008 to the Provincial Government to change land use from horticultural to urban, which was granted (Future Cape Town 2013).

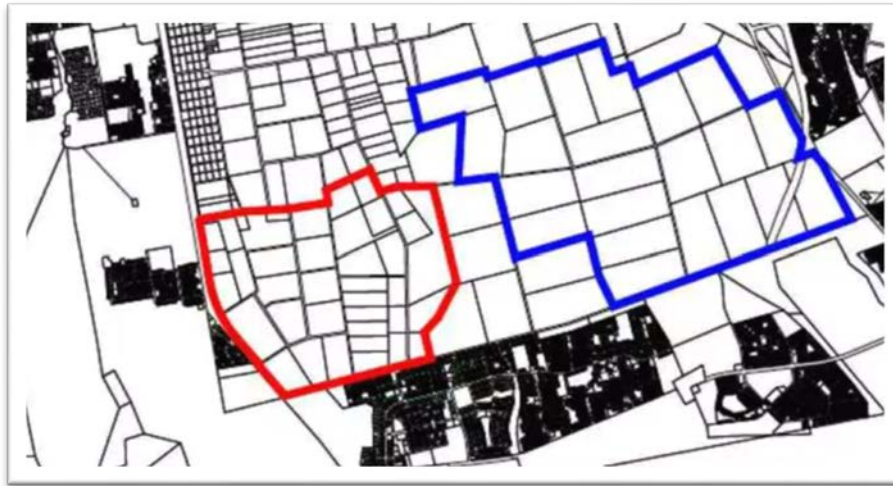


Figure 5 Rapicorp (Blue) and MSP (Red) developments

Future Cape Town (2013)

During 2011, MSP also applied for the rezoning of the south western part of the PHA. This application though, according to the Western Cape Minister of local Government, Environmental Affairs and Development, was rejected based on the concerns of other interested parties (Bredell 2014; Grobler 1997).

This decision was based on research identifying the south western section as agriculturally productive and a provider of large scale employment. Thus, 64% of this area has been indicated to fall within current productive agricultural zones. Secondly, Bredell also mentioned the need to preserve the aquifer as it is an essential water source within the whole Southern section of the PHA (Bredell 2014). Another reason was that the 'agricultural viability line' should be respected and not to be changed for the purpose of urban development (Bredell 2014). However, in 2013, the Mayor along with numerous city councillors overturned the decision in support of the proposed amendment to the urban edge in order to allow the MSP (now Uvest) development.

2.3 The PHA: A case in point for the Urban Anthropocene

As previously stated, the new epoch of the urban Anthropocene poses a tough decision for both planners as well as governing bodies. This decision relates to whether a green city structure should be protected, an economically growing city should be promoted or whether to focus on social justice (Campbell 1996).

Yet, due to the nature of South-African Apartheid planning, and especially the 1950's Group Areas Act, cities are known for low-density sprawl (Future Cape Town Summit 2013). This is more often directly associated with negative aspects such as low/poor quality of life of residents, loss of agricultural land and open space, as well as higher costs for infrastructure (Chin 2002).

This loss of agricultural land and open spaces, as indicated by Chin (2002) is in direct correlation with the statement made by Dewar, Louw and Povall (2012) in that open green spaces and agricultural land, previously zoned as green buffers during the Apartheid regime, are now becoming dangerous in terms of crime and dumping grounds as indicated in Figure 6 (Sunday 2015).



Figure 6 Illegal dumping in the PHA

Sunday (2015)

Rising incomes within city centres as well as consumer demand for housing is another determining factor of sprawl. The need for greater infrastructure and residential space close to the metropolitan area attracts low-density development on the city's outskirts (Future Cape Town Summit 2013). Urban sprawl can be seen as a realistic threat to the sustainability of Cape Town as 1.2 million people were added to the city population between 1996 and 2011 (City of Cape Town 2012).

The national vision is to be both sustainably and economically prosperous. It aims to strive for democratic principles by meeting the needs of all and managing ecological resources responsibly. This will be achieved through effective and integrated city planning as well as numerous other principles such as human dignity, social equity, and efficient use of natural resources. This vision is central to the goals of the Millennium development goals, the promotions of Administrative Justice Act (No. 3 of 200) and the World Summit on Sustainable Development (Republic of South Africa 2008).

In conjunction with this, the CoCT identified two main documents, the Cape Town Development Edges Policy as well as the Densification Strategy, as essential in combating sprawl. These two documents aim to draw urban edges, in order to create a more holistic and integrated city which follows the Geddesian principle of more monocentric cities.

It is within the Development Edge Policy that the PHA is demarcated as a natural entity which should be protected for agricultural production (City of Cape Town 2009). It has already been noticed by several authors during the 1990's that urban planning for the future faces several conflicting priorities as the prominence of the urban Anthropocene grows. Campbell (1996) noticed a triangle of priorities, including urban planning for economic growth, environmental protection and equity. Within this

triangle, the resource conflict can be seen as the most prominent. Here tension arises as to whether land should be used for its economic utility or the ecological utility of the natural environment. This also poses another challenge for sustainable development; that of social equity and the protection of the environment. For the use of this article, the ‘resource conflict’ will be of more prominence as developments within the PHA are seen to be primarily for private and governance profit, rather than a focus on social equity.

Campbell (1996) rather shares a valuable theory, stating that economic segregation will lead to environmental segregation. Here, populations are segregated based on economic prosperity. Those with ‘economic’ power will eventually transform natural resources into consumer products, a case in point for the current PHA development proposals. “These southern developments are brought up by private developers, only to change the designation of land-use from agricultural to urban development, catering for the middle and upper classes” (Sonday 2015). This statement is supported by the concluding remark that Campbell (1996) makes, stating that societies often strive to sustain and enhance political and economic systems, often neglecting the third point of ecological protection.

2.4 The challenge of the PHA

The Future Cape Town Summit found that the main problems within the Cape Town region are that of a lack of accountability during the process of urban development applications. A second remark is a lack of civic engagement as a political incentive to address the planning structures within the City. These urban developments are seen to be politically driven, rather than the product of sensible planning. This results in the city sprawling further and preventing vital land to be used at its best potential as well as pushing the city edges outwards (Future Cape Town Summit 2013).

The findings of this summit were that urban development in Cape Town is hampered by political agendas, rent seeking and vote-winning initiatives, rather than being guided towards sustainable planning by the relevant SDF and IDPs (Future Cape Town Summit 2013). The governmental land set out to use for development is often passed over by private developers. The reason for this is easily recognisable as low cost projects will not provide profits to private developers (Future Cape Town Summit 2013).

Dewar, Cooke, Todeschini & Watson (2013) identifies several challenges associated with encroachment of the PHA with urban developments. Firstly, the urban edge cannot be amended as this boundary cannot be seen as artificial. This also contradicts the city’s and province’s future visions. This barrier should be a permanent structure to protect city assets and promote densification, rather than taking away valuable land. Dewar et al. (2013) continues that agricultural land is often sold off too easily for urban development.

The third challenge relates to water and soil quality within the North-western section of the PHA. This is due to informal encroachments and illegal dumping. The PHA has abundant means to grow crops. This is due to fertile soils, good water quality and high water tables throughout the whole of the year. Encroachment upon the whole of the PHA will inevitably hamper food security for Cape Town. Any hard construction on this area will reduce the aquifer recharge. This will hamper the ecological value thereof for water security and irrigation (Berg 2007).

Lastly, Dewar et al. (2013) states that insecurity for the future of the PHA will force remaining farmers to relocate elsewhere as they fear the consistency and prominence of their futures within this region. As more formal encroachments and land use changes are made, more will be interested in the area, leading to accumulated interest to change the land use of the whole area.

2.5 Local plans for the PHA

The Western Cape Provincial SDF 2014, in alignment with the National Spatial Development Perspective (NSDP) are specific and clear documents, giving the private sector clear signals as to which parts of the city should be used for development. It also redresses the spatial legacy of apartheid.

Thus, in light of ‘taming urbanisation’ according to Allen, Lampis & Swilling (2016), the Provincial, National as well as local government should work together in achieving goals, set out in all SDFs and IDPs. Within chapter 2 of the PSDF it is clearly stated that developments within the province should give effect to a sense of place, sense of history, sense of nature and sense of limits. Thus sustainable development is the prominent focus point as social, economic and ecological factors should all be integrated for future developments (Western Cape Government 2014).

Similarly, the Western Cape Strategic Plan for 2014-2019 also states the vision as one in which GDP growth can be obtained through greater environmental resilience, more inclusion and better employment opportunities and equality. This works together with the OneCape 2040 vision in which urban planning is guided to be sustainable in the long-term. Although tourism is viewed here as the best sector to combat unemployment and economic growth, urban agriculture is seen to be of critical importance (Western Cape Government 2013).

Objective 1.3 of the Cape Town IDP also states that biodiversity should be protected to promote recreational and social opportunities of the natural environment (City of Cape Town 2014). The Provincial Spatial development framework (City of Cape Town 2010) also stated that 9100ha will be required for urban growth until 2021. 11 000ha has been found within the current urban edges (Figure 5-marked in red) and would suffice for future developments until 2021.

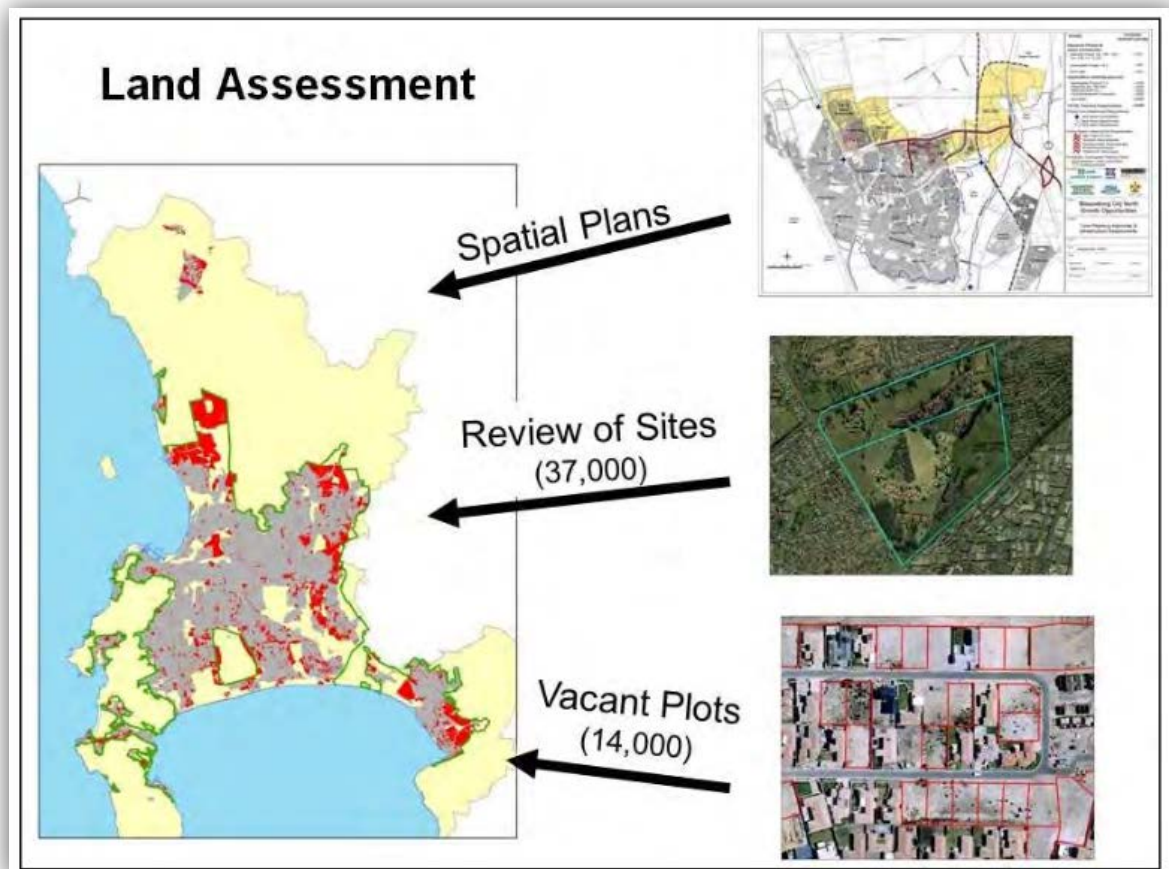


Figure 7 Available spaces for housing until 2021

(CoCT 2012)

The redrawing of the PHA urban edge is in direct conflict with the City's 2012 SDF, which supports the promotion of food security and the mitigation of food price increases. Within this document, high-potential agricultural areas are promised to be protected within future urban design (City of Cape Town 2012).

The majority of news articles have portrayed the conflict as existing primarily between local government and activists. It should, however be recognised that the PHA is equally debated between CoCT departments as well as between the municipality and Provincial Government (Future Cape Town 2013, Battersby-Lennard and Haysom 2012 & De Lille 2003). Van Buuren (2009) mentions that different departments within government value different processes due to their disciplinary- and diverse backgrounds. Thus, conflict will always be an issue. Holistic planning should, however be adopted to make compromises between these different demands.

2.6 Lessons from the past

Urban encroachment is certainly not a new phenomenon. A case study from 2008 refers to the city of Shenzhen, China. Here it was claimed that cities inhabited too much space, encroaching upon

agricultural land. This depleted scarce farming resources. Between 2001 and 2005, this city increased by more than 58km², with an annual population growth rate of only 3,38%, meaning that urban growth decreased population densities severely, thereby encouraging lower densities and encroachments upon valuable agricultural land (Lei & Bin 2008).

Similarly, such cases also came to the forefront in countries like Ghana (Kumasi), India (Hubli-Dharwad) and Columbia (Manizales-Villamaria). The reason in doing this is due to a need for higher income classes to move towards the outskirts where they are surrounded by natural habitat. This is due to more space being available at relatively cheaper building land for private investors (Allen, da Silva & Corubolo 1999). This is not a new phenomenon, since a severe global demand for cities due to rapid urbanisation (Lei & Bin 2008).

Perhaps it is relevant to mention the planning structure of Post-modern Constantinople and the perceptions of Lewis Mumford and Patrick Geddes. This works directly with what the CoCT wants to achieve in order to become a sustainable city, as will now be explained.

Here, modern city planning is especially relevant to the vision of the CoCT. In the progressive 'ecologising of society', diversity is integrated and social- and ecological spectrums are worked into the holistic fabric of the city (Sinclair et al. 2010).

Central to the redesign of ancient Istanbul was the integration of urban agriculture inside the 'city walls', acting as green lungs and a central asset to the local community in terms of economic growth. This, as Sinclair et al. (2010) states, should be synonymous with the growth of modern compact and smart cities, a vision the CoCT is striving for (Future Cape Town 2013).

The city of Istanbul bounced back from economic decline through decentralisation into local and regional food production. These green lungs were situated within and around the city. These investments were crucial as it not only motivated a stronger local economy by adopting shorter and cost-effective travel times, but also helped local employment through skills development in agriculture and creating an ideology of conservation (Sinclair et al 2010).

Urban planning today, however, faces simplistic and mostly political conflict of the economy vs. environment. It should be realised that sustainability within the urban Anthropocene is not a blueprint solution, but rather one of trial-and-error. Sustainable planning should be three-fold, focusing on economic growth, but not in a way that degrades ecosystems in the process (Campbell 1996).

3. EMPIRICAL ANALYSIS

Qualitative data was collected through semi-structured interviews with various stakeholders, informal dwellers, commercial farmers as well as public officials in the area. Findings are categorised under relevant themes and presented in this first section of the empirical analysis. Annexure 1 will provide further information as to how these interviews were conducted and what kind of questions was asked.

3.1 The PHA in numbers

The PHA is known to have been 13 000 hectares before urban encroachment started within the mid-19th century (Rabe 1983). Callie Bröcker, the chairperson in 1994 of the KVDBV, indicated that there were 100 farmers within the area (Battersby-Lennard & Haysom 2012), a statistic which currently dropped to about 32 land owners (16 Smallholding farmers and 16 commercial land owners (Western Cape Department of Agriculture 2016). This contrasts to 38 farmers in 2012 (Battersby-Lennard & Haysom 2012).

Today, as some farmers and officials have noted, the MSP/Uvest boundary of 272ha will cause for a further amendment of the urban edge.

The proposed Sheffield road alignment within the Northern section, close to the Lansdowne/Govan Mbeki road has already removed 176,50ha from agriculture for future construction purposes. The Schaapkraal Smallholdings area of 160,41 ha, and the Vanguard drive island of 231,03ha has also been earmarked for development. An area, rezoned by Province for development by Rapicorp is stated to be 445,90ha. The total remaining agricultural area then consists of 3652,04ha (Battersby-Lennard & Haysom 2012). This may, however, may be further reduced as the MSP land is set to take up 280ha of primarily horticulturally zoned area, reducing the horticulturally zoned area to 2358,2ha.

3.2 Informal settlements within the PHA

Informal dwellers, mostly living in the settlements of Egoli and Jim se Bos were interviewed. It was found that the majority of people living in the PHA (78%) according to the census data for 2011 were seen to receive an income lower than R3200. Another 20,6% is seen to have no income, with only 13,9% receiving between R3201 and R6400. 65,6% of residents in the PHA, live in informal dwellings (CoCT 2013). Interviews with informal dwellers also indicated that these informal settlements are growing as more individuals from neighbouring countries are infiltrating the area. This statement can be supported by the census data from 2011, stating that the PHA population expanded by 58,2% from 2001 to 2011 (CoCT 2013).

2011 census data for the Cape flats region also indicates that only 27% of the population is older than 20, has matric or higher, with 38% of the population aged between 15 and 64 are unemployed (CoCT 2013).

Another study found the employment rate of the PHA to stand at 2,5 people per ha, with 15-18 permanent labourers per 10 ha vegetables on a permanent basis (Battersby-Lennard & Haysom 2012). The CoCT-PEPCO (2009) report also indicated that 70% of this employment went to women (Batterby-Lennard & Haysom 2012).

One interviewee, originally from the Transkei region, moved to the PHA nearly 20 years ago, and has always been employed by the local farms ever since. Living in the informal settlement of Jim se Bos, she is within walking distance of her employer, which is one of the contractor farms for Pick-a-Pay. Working from 6:00 in the morning and mostly returning home late in the evening, she is relatively positive, indicating that without this employment, she will not be able to support her household.

All participants indicated that the PHA has become much denser although the number of informal settlements in the area stayed constant at eight for the past 15 years (Figure 8). This is especially relevant in the two informal settlements of Jim se Bos (2.88 ha) and Egoli (2.22 ha) (Figure 8). The majority of the new residents are unemployed (a total of 38% aged between 16 and 65) and seeking opportunities within the agricultural sector (CoCT 2013). Interviewees perceived most of these 'new' dwellers take part in criminal activities within the PHA.

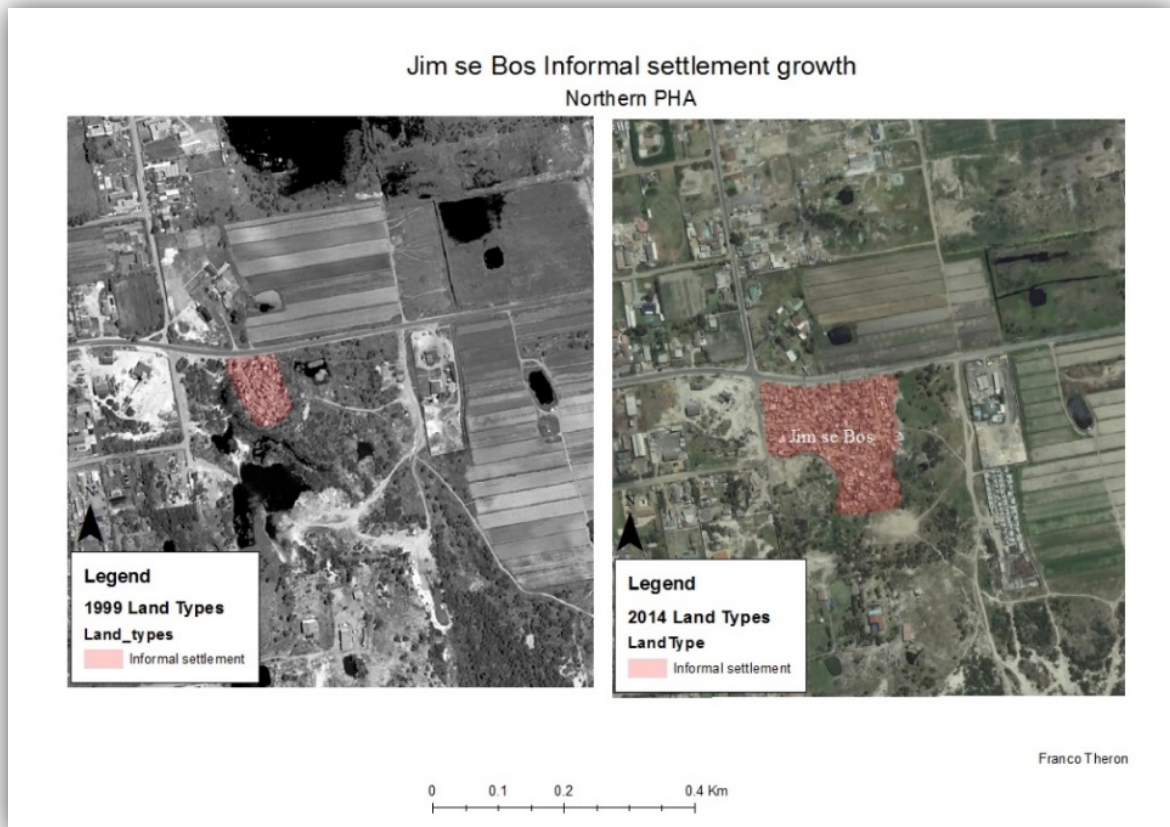


Figure 8 Jim se Bos densification and sprawl

According to a Draft Synthesis report conducted by the CoCT (2012), claims concerning increasing densities can be supported by density measurements. Jim se Bos, Egoli and Williston are known to be the most densely populated informal dwellings within the area, with Jim se Bos being the greatest due to its dwelling unit count per hectare of 105.2 (Total of 303 dwelling units). Egoli, the second biggest has a dwelling unit per hectare count of 158,1 (Total of 351 dwelling units).

According to interviews with farmers, informal residents and city officials, the Siqalo informal settlement is the most rapidly growing informal settlement. This seems to be a major concern for farmers as officials only noted the existence of this settlement in 2011. Figure 9 and 10 confirms this as the settlement didn't yet exist in 2010.

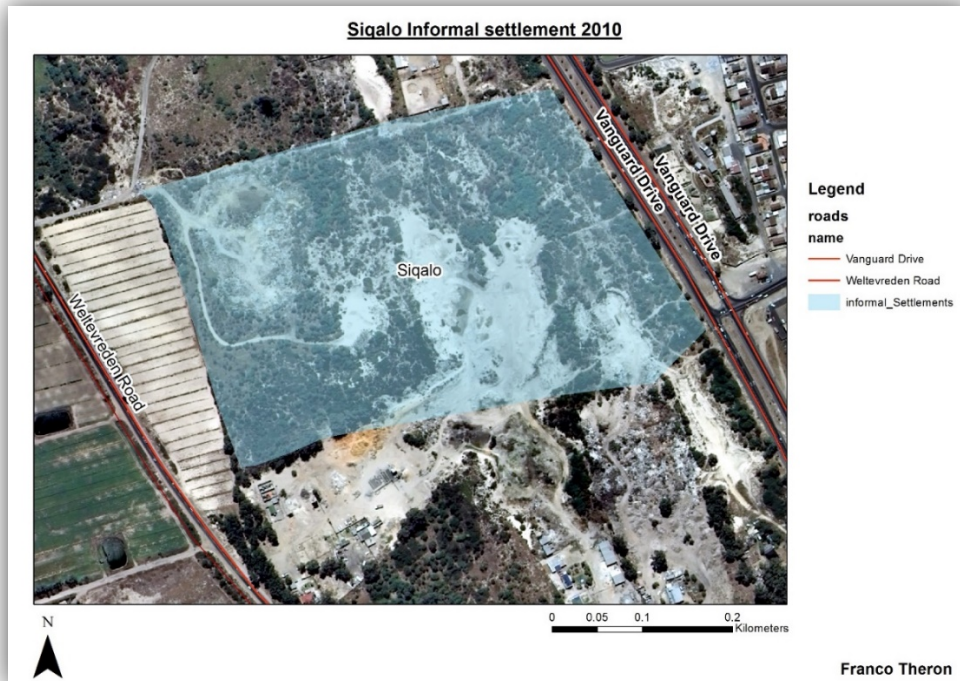


Figure 9 Siqalo land 2010

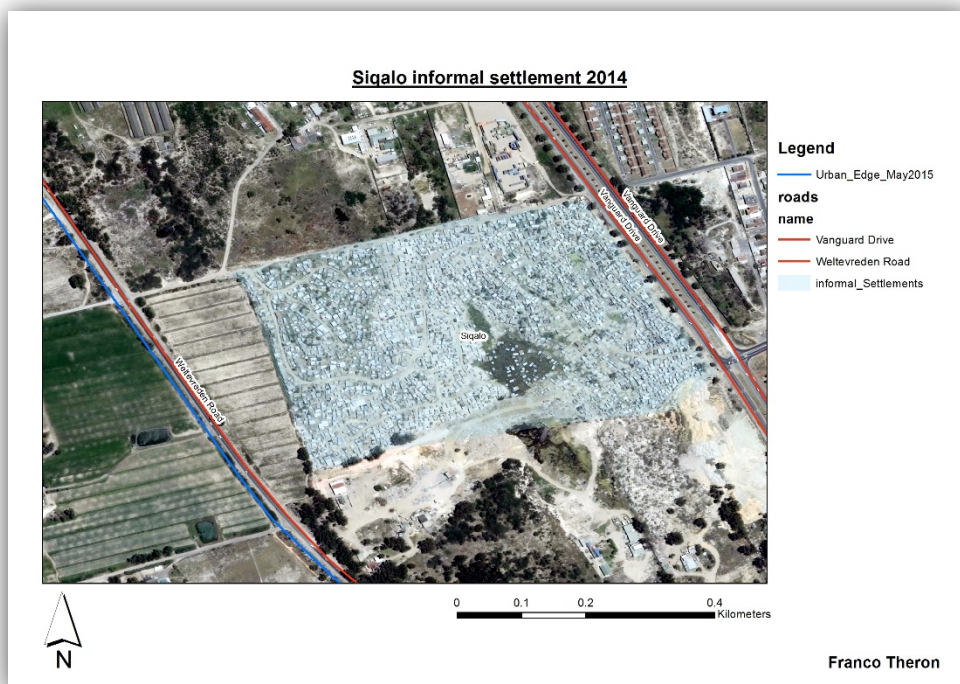


Figure 10 Siqalo settlement 2014

This settlement is also known to have the least amount of farm employees and was also implicated in connection to power outages and cable theft during interviews and literature search (Knoetze 2014).

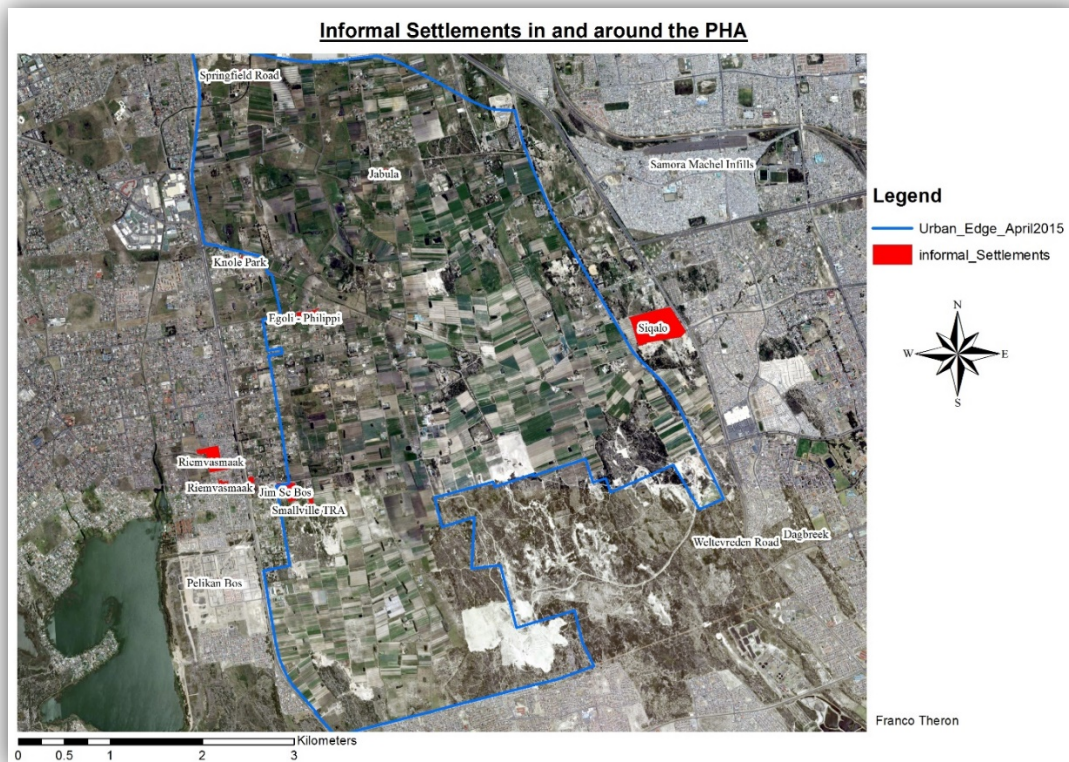


Figure 11 Informal settlements in the PHA

3.3 An uncertainty due to food prices

All farmers indicated that the market is unstable. Big commercial farmers within the PHA, contracting for chain stores such as Woolworths, Fruit & Veg, Pick a Pay, Spar and Checkers all have to produce at an increased figure of 10% every year.

During March 2011 to February 2012, 11 367.67 tonnes of PHA produce were sold to the Cape Town Fresh Produce Market (CTFPM) (Battersby-Lennard & Haysom 2012), a figure which is said to have increased as one farmer noted his carrot production to be a total of 5066,864.60 tons between March 2015 and January 2016. Several farmers cater for a bigger National and International markets, meaning that more produce are destined for bigger and more diversified markets. This, although seeming like a large quantity, is not profitable to sell to the formal markets. Thus, most commercial farmers are opting to sell off 60% to the formal markets and 40% to the informal markets, with 5% of this going to the ever more demanding and controversial Epping market. This is a slight variation to what Battersby-Lennard & Haysom (2012) found, indicating that 70-85% are destined for the retail chains. This does not indicate that the information has been incorrect, rather this indicates, as farmers stated, that they find more security and a stronger market price and stability within the informal markets.

This increase in formal market prices and demands due to labour laws make it more difficult for emerging farmers to be introduced into the formal market (Labour prices are constantly increasing, with an increase of 88c per farmworker per hour in March 2016 (Potgieter 2016). Even though this seems to be the case, vegetable farmers are selling off produce to more overseas markets. This is due to the stability of the seasonal changes of the PHA, compared to the rest of South Africa. Many farmers also contradict the statement that the PHA only provides 50% produce to the CoCT (Battersby-Lennard and Haysom 2012). Rather, this is seen to be 70% as informal market distribution are becoming increasingly prominent.

A report, commissioned by the city, in 2008, also stated the PHA to be the most productive per hectare (R90 000/ha) compared to other agricultural areas in South Africa (average R18 000/ha) (City of Cape Town 2012). This, as several farmers explained, is due to the constant growth throughout the year, not being affected by seasonal changes. Figure 12 indicates the temperature difference during summer months, within the Western Cape. This is an indication of the relatively cool and stable climate conditions within the PHA, supporting the notion that the PHA produces between 2,5 to 5 crops annually (Battersby-Lennard & Haysom 2012).

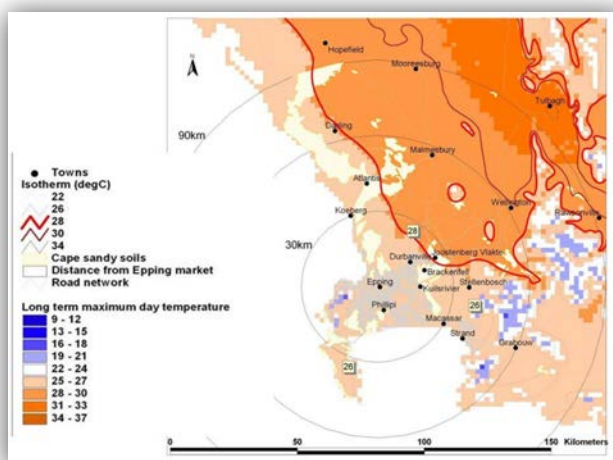


Figure 12 Temperature variation within the Western-Cape, typical of the hot summer climate (Battersby-Lennard & Haysom 2012)

The PHA has the highest gross margins and nett farm income in South Africa, if compared to other agricultural areas (Hennessy 2013). During an interview with the head of the Kaapse Vlakte en Distrik Landbouvereniging, it has also been mentioned that 8 new storage spaces has been constructed by commercial farmers, indicating that commercial farmers not only produce more vegetables for a growing chain store demand, but also indicating that more land is being cultivated and harvest is gathered throughout the whole year.



Figure 13 Beetroot harvest on previous sand mine area (Franco Theron)

3.4 Uncertainty due to different land uses

Figure 14 demonstrates the constant amendments made to the urban edge of Philippi since 1953 (Hennessy 2013). This, as most farmers indicated, is a major concern in terms of agricultural sustainability within the area. Most farmers are, however, willing to sell off land, provided the price to be high enough. They do, however, also indicate that although other farming land will be cheaper, it will be more difficult to cultivate and sustain productively.

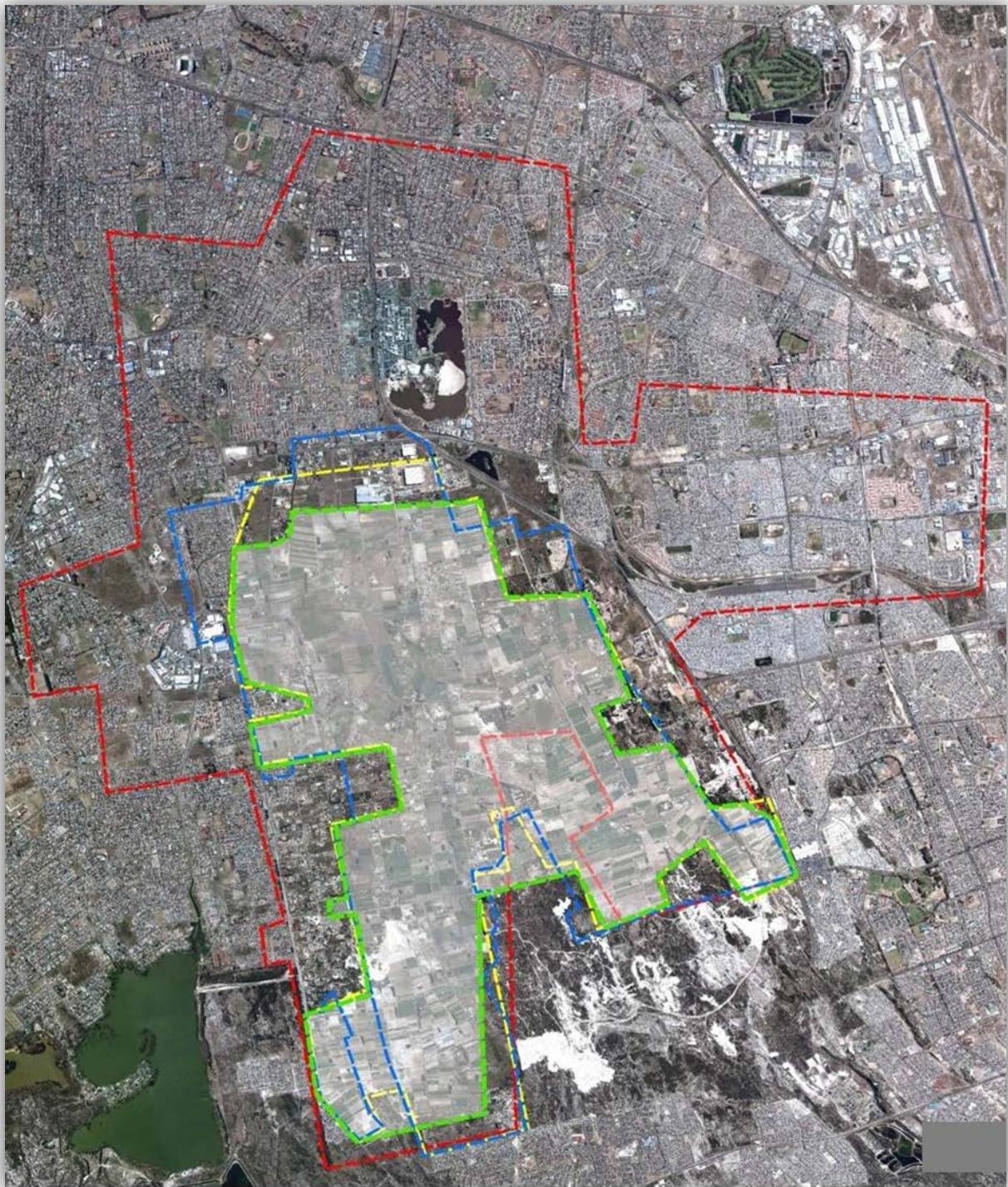


Figure 14 Changes made to the PHA urban edge (Red-1953, Blue-1988, Yellow-2002 & Green-2011) (Hennessy 2013)

The RapiCorp development (472ha) has already been approved by amendment of the urban edge (Bredell 2013) and an EIA process, as it was stated that the land has never been farmed. The problem with this is that there are still significant sand deposits, which could serve potential farming and agriculture to commence afterwards. It will also be located on a section of the Cape Flats aquifer, known to have the highest aquifer recharge (Hennessy 2013).

The Uvest application for the South-Western section (Figures 13 and 14), submitted in 2012, is still undergoing public debate as this area is still under individual ownership and also intensively cultivated (Hennessy 2013) although developers have reasoned with this remark, stating that this land is farmed, however, not productively. Even though not as big as the previous Rapicorp amendment, this is seen as one of the hardest fought cases within Philippi, due to the nature of the soil.

One land owner, and florist has been working on this land for 60 years, indicating that this land is very fertile and productive. Asked whether he would sell this land, he stated that the uncertainty from encroachments gives him more reason to sell if the price is high enough, adding and concluding that theft and finances are eroding his profit, even though not as much as the other, more commercialised farmers.



Figure 15 The South-West corner (Uvest land) of the PHA

Hennessy (2013)

Uvest proposed rezonings

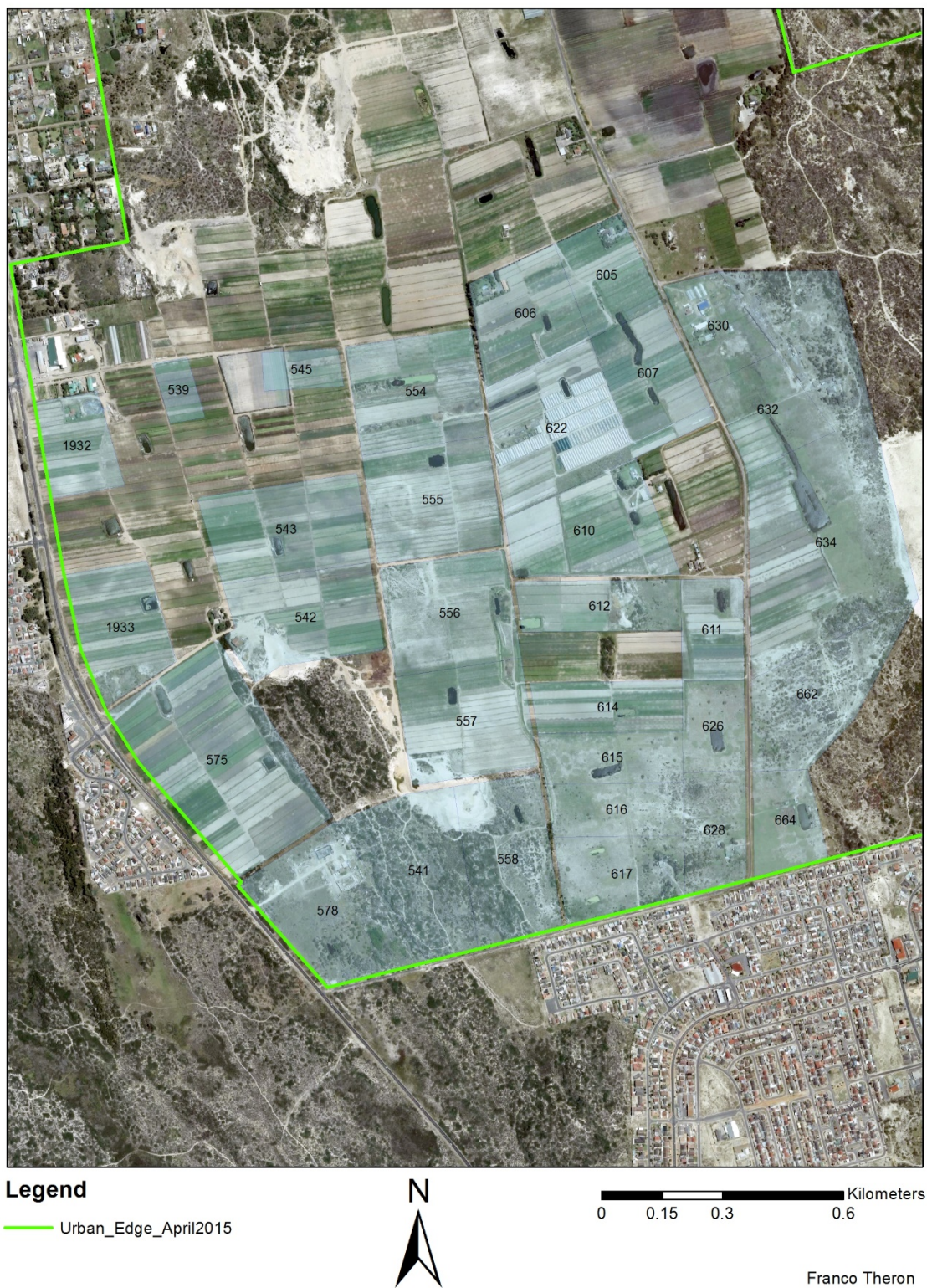


Figure 16 The MSP (Uvest) development area

3.5 Public participation and the general marketing of the PHA

Government institutes and planning bodies are prioritising public interest in terms of urban agriculture in order to achieve better nutrition (especially for lower socio-economic classes), household incomes and basic food security. This is said to be done through adopting policies to integrate agriculture and other urban land uses (Purushothaman, Brook & Purohit 2004).

Although this statement can be proved by documents such as the Western Cape Department of Agriculture's annual report for 2013/14 (Western Cape Department of Agriculture 2014), in a statement to support emerging farmers, the general consensus was that emerging farmers within the PHA do struggle to make their produce viable for commercial use. Several farmers as well as political officials has concluded that some emerging farmers are helped by the larger commercial farmers in the area, but even with this, are struggling to sustain profits.

Many describe the difference in land use across the PHA to be a lateral effect of an inefficiency of the state to provide enough support for these emerging farmers. Rather, as several commercial and emerging farmers themselves stated, they turn to other, more profitable land uses. Several sources have indicated the lack of nett profit for emerging farmers, as the Harvest of Hope project only acquired a net profit of R90 per capita/month (De Satgè and William 2008).

3.5.1 Fighting for sustainability within Cape Town: Jurisdictional fragmentation in balancing the demands between employment, food security and housing

All interviews conducted with public officials indicated that the city has a very difficult task at hand, when it comes to sustainability within the Anthropocene. This means that different departments such as the Department of Human Settlements and the Department of agriculture all have different aims and objectives.

It is believed that the total Cape Town population will grow by 60% between 1996 and 2031 (Also stated in City of Cape Town 2015). Currently, the latest census (2011) indicate a backlog of 264 800 households. Annually, the City of Cape Town receives a population increase of 3%, indicating that Cape Town will have a population of 5,8 million by 2030. Further census data gathered during interviews also indicated that 61% of Cape Town's households have an income less than R13000. Almost 48% of the population, aged 20 and over has matric (Also supported by City of Cape Town 2015). It is therefore gathered that the biggest housing demand will be for lower socio-economic classes.

In terms of unemployment, out of a total of 3 740 026 people, 85,2 % are literate (2007), with only 773 987 having matric and 1 194 105 having some form of secondary education (2011) (Western

Cape Government Provincial Treasury 2012). This, not really an improvement from the 2001 census data, has been proven during interviews to be a major concern for the city as a severe focus should be placed on the employment of these individuals.

In terms of agriculture, the city only has 3 intensive food growing areas, namely the PHA, Botfontein and the Joostenbergvlakte (Kleynhans 2008). Several officials also referred to the Food security study of Battersby-Lennard & Haysom (2012), indicating that food price stability and a focus on provision for lower income communities should be of utmost importance.

3.6 Formal encroachments

Formal encroachments results in the incremental changes made to the urban edge. Decisions made were seen as inconsistent and differing with each application. Interviews indicated that the Oakland city/Rapicorp amendment was not approved by the city, however, it was supported by Provincial Government. The MSP/Uvest amendment were supported by the city, but not supported by provincial structures. Provincial government is seen to prioritise the needs of the greater province and that the City has taken over the biggest role in decision making as it has more knowledge of the area. The biggest concern then, as stated previously, is the fragmentation between city officials and departments and not between the spheres of government.

Asked as to how decisions are made, interviewees indicated that future projections are compared to one another. However, the difficult task being in having a fragmentation within political opinion as well as between the public itself. The city has a very difficult task to keep all stakeholders happy and to achieve all developmental goals.

3.7 A need to define the area

Public officials interviewed, stated that the area faces severe uncertainties as farmers are unsure whether to fight for the area or leave. This is a direct correlation during interviews held with all farmers. A political decision is much easier to be made when the public voice from the general public and farmers are inconsistent. During an interview, it has been indicated that the Schaapkraal smallholdings road edge amendment (in 2012) (Figure 17 and 18 (Hennessy 2013) were made in order to introduce an area of smallholdings for emerging farmers, thus defining the area as strictly only for agriculture. It has been noticed that this area has cumulatively been used for other non-conforming and illegal developments (City of Cape Town 2012).

An amendment was also made in 2012 to move the urban edge between Vanguard drive and Weltevreden Road, in an attempt separate livestock farming practises within this section from the horticultural activities within the PHA. Currently, multiple illegal land uses are encroaching the PHA

as more and more farms are being sold off due to uncertainty. This, as stated within interviews, is a severe issue as the designate land use zoning of horticulture is becoming a much greater challenge for officials and farmers alike.

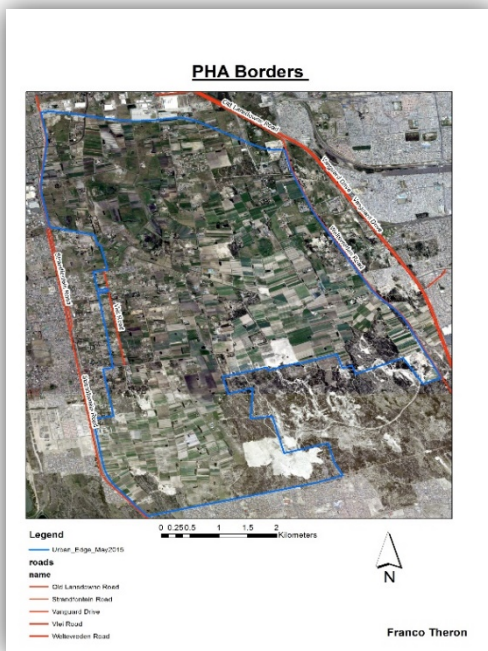


Figure 17 PHA road borders

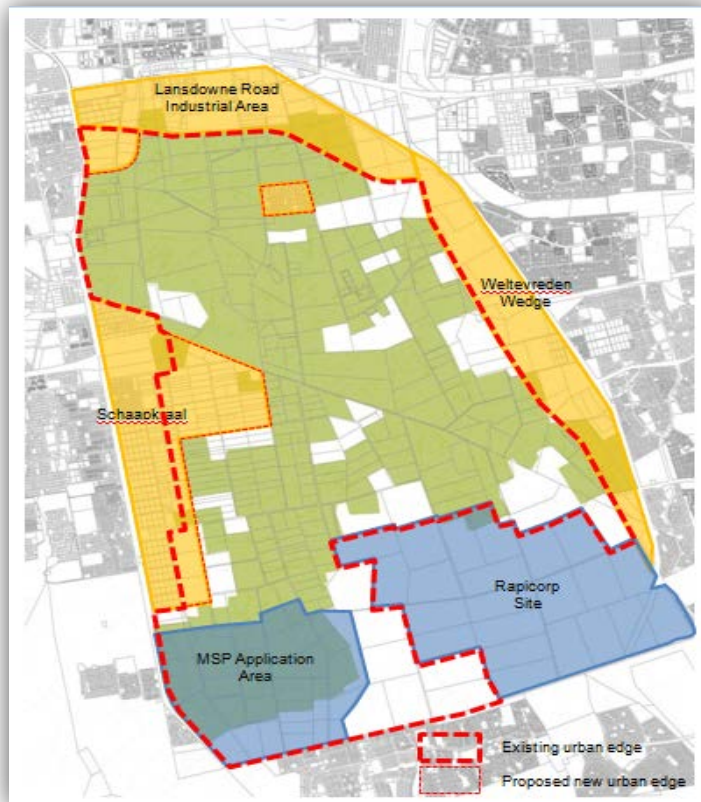


Figure 18 PHA Encroachment areas

3.8 Challenges for urban development in the PHA

Multiple interviews with public officials as well as farmers confirmed that any urban development within the PHA will be costly and timely. It is stated that high water tables within the South may increase the risk of flooding (the water table is lower than 1 metre during winter times) as indicated in figure 19 (Hennessy 2013).

Any development, specifically within the South will then require major investment in bulk infrastructure, such as roads, sewerage, water and electricity. Due to the PHA also not being included in the city's previous master plans, the Southern part is relatively isolated from economic opportunities (Hennessy 2013).



Figure 19 Flooding during August 2013

4. RECOMMENDATIONS AND CONCLUSION

This section will analyse the data gathered through interviews and the literature review in order to draw a valid conclusion to this study. In order to do so, data gathered from interviews had to be discussed as the main themes that were raised during this study, against the background of the literature review. This is done in order to answer the main research questions and to determine whether the hypothesis is true or false.

Numerous other case studies, similar to the case of the PHA, indicate that urban encroachment onto agriculturally zoned land is not a new phenomenon and has been occurring ever since rapid global urbanisation after WWII (Lei & Bin 2008). Agricultural land, close to the city metropolis, such as the PHA (30km) is a relatively cheaper open space for human settlements to grow on as governmental funding will be higher in order to accommodate new infrastructure. Private developers also choose this land as it is spacious and perfect for a growing middle class, specifically within a developing country (Allen, da Silva & Corubolo 1999).

These green lungs are then known to be a global controversial conflict point, as different sustainability goals are put forward against one another, making it difficult for governing bodies to regulate and decide as to what is needed most.

This study then aimed to discuss this issue of urban encroachment within a society, focused more on sustainability. It aimed to compare different land uses against one another in order to discuss the future of the PHA and which will be the most sustainable for an ever increasing city. The jurisdictional fragmentation between different institutional spheres, departments and individuals has also been compared in order to try and find the starting point of these discrepancies. Theft is a major concern within this area. This study aimed to analyse this as to whether theft can be seen as one of the major factors, ultimately helping the process of land use changes occurring within the PHA. Lastly, public participation and public voice has also been added in order to find out the role of the public in ultimate decision making over this area.

4.1 Findings

The literature review introduced the reader to the problem that urban landscapes presently face in terms of sustainable growth. It acted as an introduction towards the current urban Anthropocene that is referred to in Allen, Lampis & Swilling (2016). Secondly, it introduced the reader to the multiple focus points and often contrasting goals of a developing city such as the city of Cape Town.

The main argument in this research is that urban agriculture, upon productive soil such as the PHA, will best suit a growing urban population in terms of food security and employment. This perception

is contested by authors such as Gordon & Richardson (1999), indicating that food production and prices thereof are growing, even though urban areas are expanding over productive agricultural land. This statement can be supported by numerous interviews with officials and developers, believing that food production can grow through new inventions in agriculture such as hydroponics and vertical farming.

Although it has to be regarded that the housing demand is growing very rapidly within Cape Town, it also has to be stated that urban encroachments since 2008 had negative consequences for the area (as will be discussed below). A further remark is that the two areas, within the Southern section, being bought up by MSP/Uvest and Rapicorp (20 000 private houses), will cater for the private market.

Although food security within Cape Town is a prominent factor with the encroachment of the PHA, as Battersby-Lennard & Haysom (2012) noted, other determining factors such as low-skilled employment, the critical biodiversity as well as the underlying Cape Flats aquifer will have to be taken into account.

With the PHA being one of the three largest agricultural units in Cape Town in relation to economic turnover according to several officials as well as commercial farmers (Sonday 2015), it has been stated during several interviews, that the PHA should be considered as a prominent agricultural unit for exports. This statement can be supported by a WESGRO (Cape Town & Western Cape tourism, trade & investment) report, in 2014, stating the agricultural sector, although just consisting of 11,5 million ha and 12,4% of SA's total agricultural land, produces between 55-60% of the country's exports, a R7 billion/year commodity (WESGRO 2014).

Within one year from 2011 to 2012 the international demand for Western Cape vegetables grew by 1,69% (WESGRO 2014). Provincial government claim this figure to have grown by 40,84% (export value for Western Cape vegetable products) between 2012 to 2013 (Western Cape Government 2014)

Hennessy (2013) in relation to Dewar et al. (2013: 15) further claims that the two developments within the South, if approved, will have a cumulative effect on future developments occurring within the PHA as well as a detrimental emotional state for farmers as uncertainty will grow. This will be a cumulative process where land owners will sell off their property, in effect encouraging the rezoning of this area from horticulture to other zonings.

4.1.1 Previous urban-edge amendments

Throughout this research, several interviews as well as literature has proven the detrimental effect of amendments made, initially for the preservation of horticulture. The two biggest changes made to the 2012 urban edge, have been within the Schaapkraal region (160ha) and the Vanguard

drive/Weltevreden road (251,02ha) as seen in figure 17 (Hennessy 2013 and Battersby-Lennard & Haysom 2012).

Initially the City of Cape Town decided to demarcate this region in one hectare plots to help emerging farmers (interview, supported by City of Cape Town 2012). Although commercial farmers are known to help these new land owners, several emerging farmers indicated that it is very difficult to penetrate the commercial market with such a small piece of land. This, as many have stated is due to firstly the high price of land (between 1,4 and 1,5 million South African Rands per hectare) and secondly, an increase in labour and farming costs. Land in the Schaapkraal smallholdings area is thus used for several other land activities such as informal dumping sites, scrapyards and landfill areas.

Through aerial photos it has also been indicated that the Siqalo informal settlement came to existence shortly after the amendment of the urban edge between Vanguard- and Weltevreden road (Figure 10). This, as farmers and the department of District Spatial Planning indicated, has a severe impact on the sustainability of the PHA. This settlement is known to be aggressive and have relatively low employment rates. Farmers and several news articles also gave indication as to the unrest against the provision of public services, such as electricity supply (Solomons 2014; Knoetze 2014).

Both these cases then indicated that although the urban edge around these areas has been moved in order to distinguish it from the horticultural zone, it has impacted severely on the land use and lateral effects on the rest of the area.

This, as many stated during interviews, in relation to the document of Hennessy (2013) makes for the PHA to be regarded as a grey area within the city. Without a definitive definition for land use in this area, and without correct leadership and management from the state's side will affect the transformation of this area.

Several interviewees also noted that although the PHA is included in SDF's and IDP's, this area alone should have a framework, being able to be defined and having a permanent edge. The current legislation and an unwillingness to regulate this area alone creates pathways for the urban edge to only serve as a relative edge, rather than a permanent demarcation and barrier.

4.1.2 Land use within the PHA

As proven throughout this research, using information from the food security study in Battersby-Lennard & Haysom (2012) as well as personal accounts, it is evident that soil types are ideal for productive vegetable crops throughout the year (Rabe (1983). This was supported by interviews with

numerous farmers, such as Ian Grimbacher (Archer 2016) and the Western Cape Government (2014), stating that the PHA has an annual crop rotation of 5,5 compared to the 2 rotations within the rest of South Africa. Numerous farmers as well as city of Cape Town officials indicated that although the soil may be loose due to its sandy texture as well as windy climate, temperatures are stable throughout the year being regulated by the sea breeze. This is especially the case within the Southern section, where temperature are known differ between 8-11 degrees Celsius during summer periods (Figure 12).

Land use is best suited for agricultural practises and the sandy soil, although costly to rehabilitate, is perfectly suited for farming. Although salts and wind may be the biggest factors against crop fertility, the high water table is perfectly suited.

Hennessy (2013) explains that while formal developments may bring its own positive factors, this is outweighed by the R150 million/ annum agricultural industry within the PHA. In this document, it has also been stated that low cost housing units will not be ideal for the area, as implementation costs for infrastructure will be significantly high, only to be payable by private interest parties.

The PSDF has also set out 11 000ha for housing development up until 2021 (Figure 7). There is therefore no need to encroach upon valuable agricultural land. This is only an attractive option as the PHA is situated very close to the metropolis, added with a relatively cheap land price for public and private developers (CoCT 2012). Numerous developers also noted that although 11 000ha may be stated to be available, this statistic is seen as a misperception as many of these spaces has biodiversity and heritage factors, keeping any developments to be done on these pieces of land. This is one of the main reasons for the PHA to be in such high demand.

4.1.3 A reduction in land owners, but more employment opportunities

Through this research, it has been realised that there are significant differences between employment rates in the North- and South PHA, with the Northern section employing less individuals, based on a seasonally basis. Within the Southern section, farms are relatively the same size (23-26ha), only with the exception of one farm being 100ha. Although being the same size, more individuals are employed (between 100 and 400) in comparison to the Northern farms (40-60 employees).

One land owner and key member within the Kaapse Landbouvereniging, directly within the MSP owned land, indicated that although the number of land owners may have been reduced from 46 (Rabe 1983) to about 16 commercial land owners (Supported by Western Cape Government 2016), the number of employed staff has risen significantly as land becomes more productive and the demands from commercial chain stores cumulatively grow. In 2012, the total employment figure was believed to be between 3500- 5000 (Battersby-Lennard & Haysom 2012), however, land owners believe this

figure to have risen since then (although precise statistics couldn't be provided) with farmers renting and rehabilitating the land of previous sand mine owners.

Farmers is also said to care for their employees, statistically indicated as 2,5kg fruit per employee on a daily bases (Battersby-Lennard & Haysom 2012). As for housing, most of the employees are said to travel from the informal settlements of Jim se Bos and Egoli, with traveling services being provided daily.

The total amount and growth of employment within the PHA is a debatable topic as many sources give different numbers. The general consensus, however, is that employment rates are growing. With the PHA consisting of about 27% (WESGRO 2014) of the total Western Cape agricultural land, the following statistics can, however support the statements made during interviews. Although agriculture is one of the smallest employment sectors in the Western Cape, it has grown by 23% from 2008-2013, compared to the national average of 7,2% (Western Cape Government 2014).

4.1.4 More than jurisdictional fragmentation, a fragmentation within public voice

Van Buuren (2009) confirmed that different spheres and tiers of governments will have conflicting visions, as all come from different backgrounds. Sinclair et al. (2010) also confirms this statement, indicating that different governmental departments will have different perspectives on sustainability, as goals within each department will differ. Lord (1979), Shabman (2005) (in Jamison n.d.) and Berg (2007) also state that individual perceptions and goals may differ as most politicians are more concerned with individual concerns, than for that of long-term sustainability.

Interviews during this research proved this to be the case, however being less focused on politicians, but more so on governmental spheres and departments. The biggest concern, however, is that conflict does not lie between Provincial and local government, but more so within the city of Cape Town administration itself. Being focused on human settlements, employment and food security, city administration has a multitude of focus areas and competing goals. Land use is then the biggest controversy as all department want to utilise land closest to the metropolis to fulfil their own goals.

Conversations with public officials, academics, as well as farmers themselves indicated that although public voice should prevail and guide land use management, this seems to be a sore point for the PHA. Farmers within the PHA, being affected by a multitude of factors, are uncertain about the future of the area. Uncertainty grows as only a selected few land owners are willing to fight for the existence of the area. The majority of farmers are, however, reluctant to leave if and when they receive a large enough price for their land.

Public officials state this to be the biggest concern, impacting the future of the area. Although there is public jurisdictional fragmentation, planning is guided and regulated by guide plans and policies. A strong enough public voice however, will be needed against rezoning applications. This is believed to be the biggest role player in the certainty of land use within the PHA.

4.2 Conclusion

The main research question was: Is the PHA more suitable for agricultural use or will rezoning to township development be more suitable for the sustainability (in terms of Economic, Social and Environmental factors) of Cape Town? Answering this question proved to be very difficult as minimal current land use statistics could support the statements made by officials, informal dwellers and farmers. The general consensus was that farming within the whole of the PHA, would be more appropriate for agriculture (although being influenced by external factors such as labour laws and theft) and will have a definitive negative impact if it was to be completely encroached by other land uses. Food security and low-skilled employment opportunities will decrease within the PHA if more encroachments occur on primary agricultural land.

The sub-questions proved helpful as it helped to indicate why the primary activity of agriculture, is incrementally being eroded. The sub-questions of public participation and jurisdictional fragmentation played hand-in-hand as policy makers, officials and farmers indicated that better decisions would be made about the future, if there is a better and constant public voice. Farmers, however, mostly affected by the other sub-question of increasing crime within the PHA as well as an increase in consumer demands, are divided as to whether they should stay or whether to move.

The general consensus then seems to be that the issue of land-use is not primarily an issue of jurisdictional fragmentation within the public sector, but more importantly a discrepancy in a much needed public consultation. The sustainability of urban development in Cape Town and the PHA, although a governmental issue, will also be largely dependent on a consistent fight against urban encroachment.

It has been gathered that particularly the Southern section of the PHA, should be reserved for agriculture as this part of the area is the most productive. This will occur after sand mining has concluded within the PHA, as the 2012 SDF states. Government and specifically the CoCT should put this in place and follow the determined policy plans. If this is to be done, agriculture within the PHA will be protected, giving land owners security to farm. With the correct attitude and ability to stand together, this case proved that public voice can and will determine the sustainability of our cities.

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ANNEXURES

Annexure 1

Semi-structured interviews was conducted during the months of October and November 2015 as well as January 2016. These interviews were conducted with several individual stakeholders, affected by the PHA case study, such as the Smallholder and emerging farmers, Commercial farmers (Die Kaapse Vlakte- en Distrik Boerevereniging)- which is being regarded as the oldest farmers union in SA (Battersby-Lennard and Haysom 2012), informal dwellers and farmers, developers as well as public officials.

Each interview lasted for a duration of 30 to 45 minutes. Various topics were covered during these interviews, which are elaborated on in this following section. All of these interviews were conducted within Cape Town, mostly within the PHA itself.

The semi-structured interviews mainly focused on the following questions:

- Developers
 - Will the proposed developments encroach any existing farms or primarily the old mining sand dunes?
 - Will this provide residency to lower income or higher income groups?
 - Why is this such a popular site to develop and how will it contribute in terms of socio-economic value?
 - Are these developments seen to harm the surrounding biodiversity and agricultural ground?
 - How will this uplift the socio economic status of the Philippi Horticultural area?
 - These proposed developments will border with surrounding lower income residencies.
 - Do you think this will influence the success of this development?
- Public sector
 - Do you see the PHA as a valuable resource in order to combat inequality and poverty?
 - There is a discrepancy between two developments within the Southern section of the PHA. One has been accepted by Province (and rejected by the City), namely within the South-Eastern section and another in the South Westerly

section has been disapproved by Province (and approved by the provisionally approved by city).

- Why do you believe this to be the case?
 - Is it accurate to say that this is due to a lack of knowledge about the area?
- The SDF and IDP of Cape Town and the Province state that cities should be more dense/monocentric. Developments should thus be more focused on new urbanism where people tend to live closer to their work and general activities.
 - Why are most developments still focused on horizontal sprawl, rather than vertical rise developments?
 - Will developments within the PHA not encourage outward metropolitan development, rather than inwards?
- The urban edge is seen as a defined and long term barrier in order to motivate denser and integrated urban development without harming resources. Why then does this barrier constantly change? Please defend
- Do you believe development within the PHA to contrast plans to build a denser city?
- Farmers
 - What is the size of your farm?
 - How do you sell your produce?
 - To which markets?
 - What, according to yourself are the 4 biggest threats within this area?
 - The PHA is known to have shrined in size due to encroachments. Still many state the land to be more productive per hectare. Are you more productive in terms of production and food supply quantities than before?
 - Theft is known to be an issue for the whole of the Cape Flats region, is this the same for the PHA?
 - Do you believe agricultural employment to be more than the planned employment figures for the proposed formal developments?
 - The Northern and Southern PHA sections are believed to differ due to water quality, availability and soil productivity. Which part would you say to be more appropriate for farming and why?
 - Is there enough public participation with public officials to save the PHA?
- Informal dwellers

- Are you employed?
 - Where are you employed?
- What are the 4 main issues for you as a resident of this area?
- How does agriculture within the PHA affect you?